UNIT I

INTRODUCTION
TO
TOWN PLANNING AND PLANNING CONCEPTS

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PRESENTATION STRUCTURE

INTRODUCTION

- DEFINITION

- PLANNER'S ROLE

- AIMS & OBJECTIVES OF TOWN PLANNING

- PLANNING PROCESS

- URBAN & RURAL IN INDIA

- TYPES OF SURVEYS

- SURVEYING TECHNIQUES

- DIFFERENT TYPE OF PLANS

PLANNING CONCEPTS

- GARDEN CITY – Sir Ebenezer Howard

- GEDDISIAN TRIAD – Patrick Geddes

- NEIGHBOURHOOD PLANNING – C.A.Perry

- RADBURN LAYOUT

- EKISTICS

- SATELLITE TOWNS

- RIBBON DEVELOPMENT

TOWN PLANNING

"A city should be built to give its inhabitants security and happiness" – **Aristotle**

"A place where men had a common life for a noble end" – **Plato**

people have the right to the city

Town planning
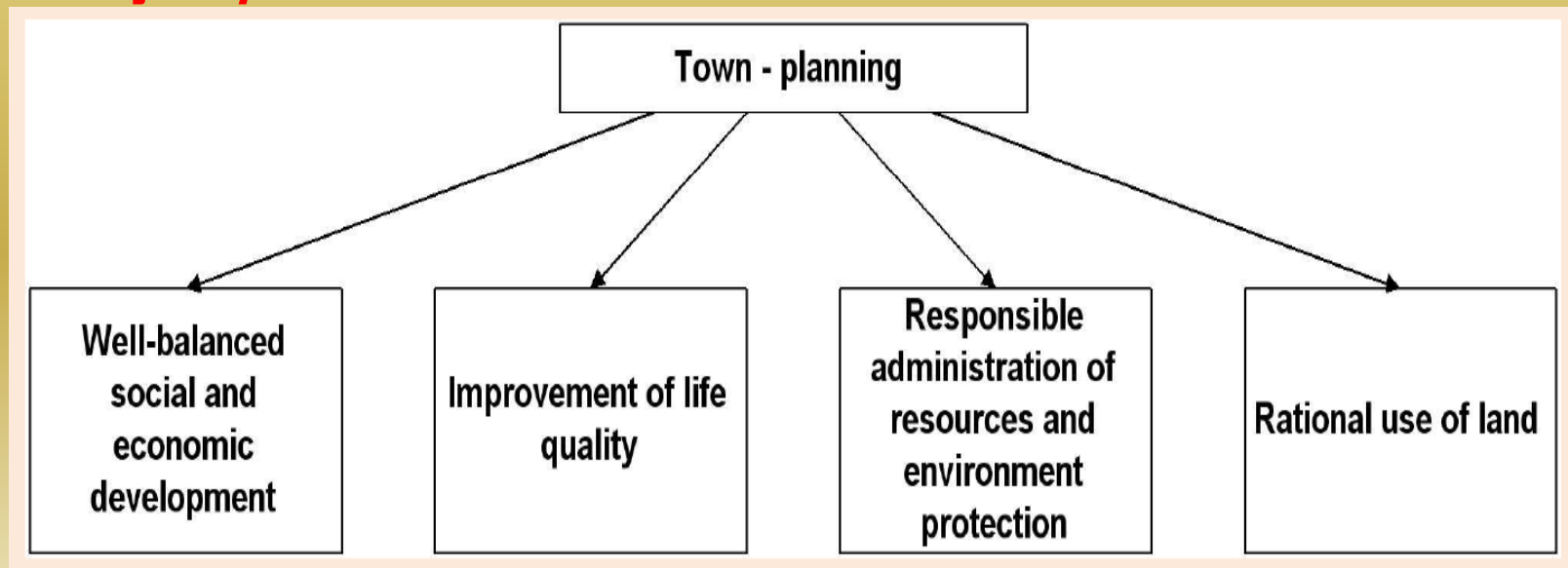a mediation of space;
making of a place

WHAT IS TOWN PLANNING ?

The **art and science** of ordering the **use of land** and **siting of buildings** and **communication routes** so as to secure the maximum practicable degree of **economy, convenience, and beauty.**

An attempt to **formulate the principles** that should guide us in creating a **civilized physical background for human life** whose main impetus is thus ... foreseeing and guiding change.

WHAT IS TOWN PLANNING ?

An art of **shaping and guiding** the **physical growth** of the town **creating** **buildings and environments** to meet the various needs such as social, cultural, economic and recreational etc. and to **provide** **healthy conditions** for both rich and poor to live, to work, and to play or relax, thus bringing about the **social and economic well-being for the majority of mankind**.

Town - planning

- Well-balanced social and economic development
- Improvement of life quality
- Responsible administration of resources and environment protection
- Rational use of land

WHAT IS TOWN PLANNING ?

- **physical, social and economic planning** of an urban environment

- It encompasses many different disciplines and brings them all under a single umbrella.

- The simplest definition of urban planning is that it is the organization of all elements of a town or other urban environment.
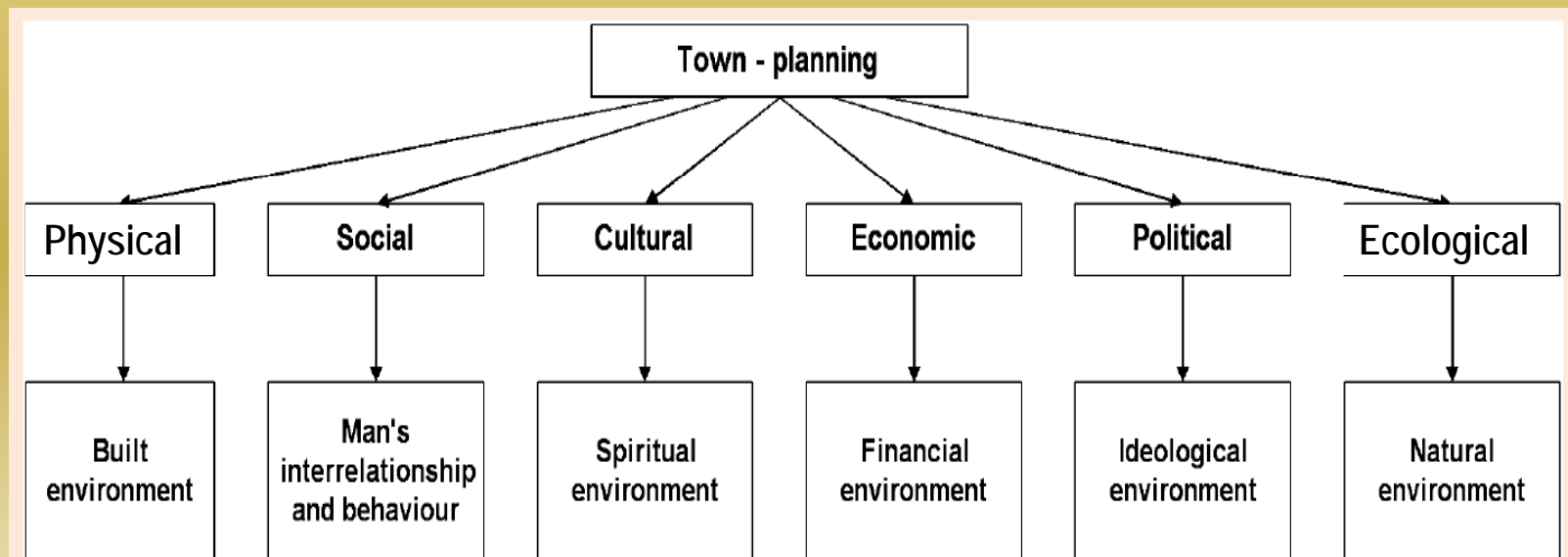
IF PLANNING WAS NOT THERE?

- **Uneven & Chaotic development** – contrasting urban scenario
- **Mixed Landuse** – Industries springing up in residential zones
- **Congested Transportation Network** – overflowing traffic than expected
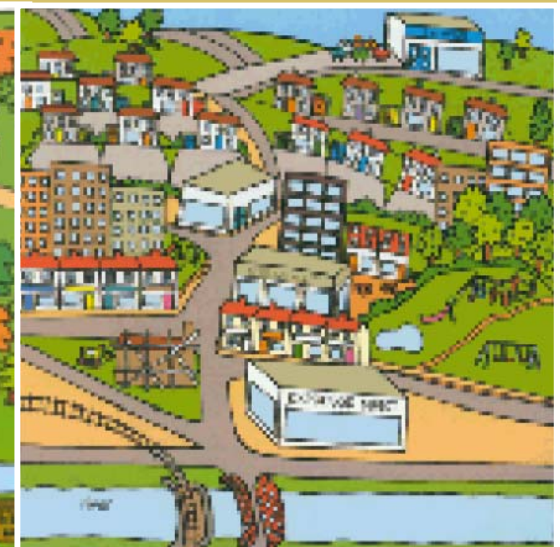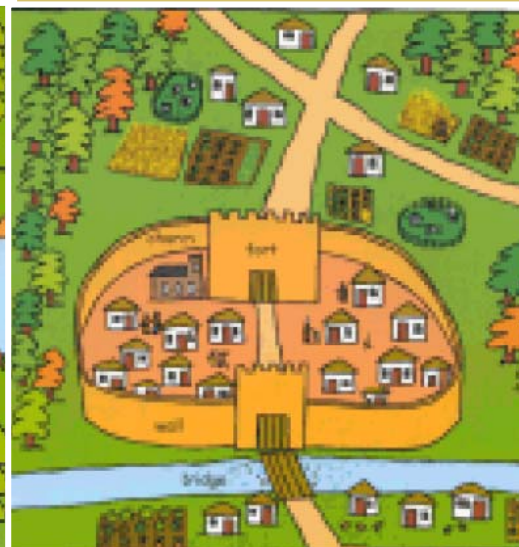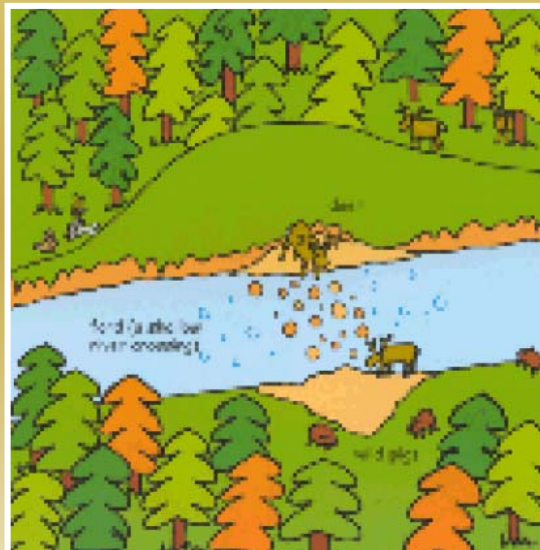
CONTRASTING URBAN SCENARIO

ROLE OF PLANNERS

- **Consider –** "human communities are always in the process of changing"
- **Recognize –** "the complexity of communities
- **Concern –** about the future

Growth of the city

AIMS & OBJECTIVES OF TOWN PLANNING

- to create and promote healthy conditions and environments for all the people –
- to make right use of the land for the right purpose by zoning
- to ensure orderly development
- to avoid encroachment of one zone over the other

HEALTH

- social, economic, cultural and recreational amenities etc.
- Recreational amenities - open spaces, parks, gardens & playgrounds, town halls stadiums, community centers, cinema houses, and theatres
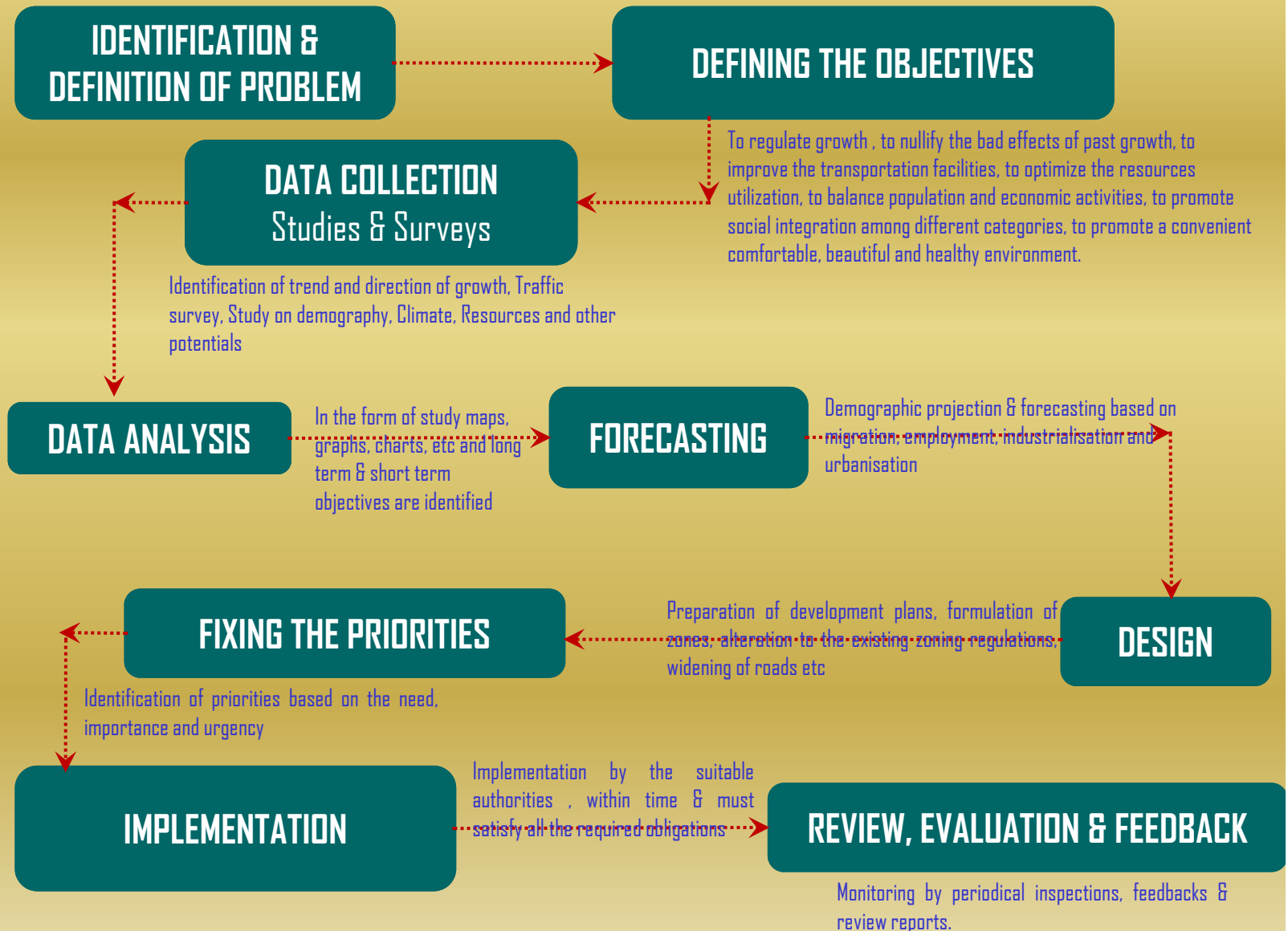
CONVENIENCE

- To preserve the individuality of the town
- To preserve the aesthetics in the design of all elements of town or city plan,

BEAUTY

PLANNING PROCESS

IDENTIFICATION & DEFINITION OF PROBLEM

DEFINING THE OBJECTIVES

To regulate growth , to nullify the bad effects of past growth, to improve the transportation facilities, to optimize the resources utilization, to balance population and economic activities, to promote social integration among different categories, to promote a convenient comfortable, beautiful and healthy environment.

DATA COLLECTION
Studies & Surveys

Identification of trend and direction of growth, Traffic survey, Study on demography, Climate, Resources and other potentials

DATA ANALYSIS

In the form of study maps, graphs, charts, etc and long term & short term objectives are identified

FORECASTING

Demographic projection & forecasting based on migration, employment, industrialisation and urbanisation

FIXING THE PRIORITIES

Preparation of development plans, formulation of zones, alteration to the existing zoning regulations, widening of roads etc

DESIGN

Identification of priorities based on the need, importance and urgency

IMPLEMENTATION

Implementation by the suitable authorities , within time & must satisfy all the required obligations

REVIEW, EVALUATION & FEEDBACK

Monitoring by periodical inspections, feedbacks & review reports.

URBAN & RURAL INDIA

Urban Area – Census of India

- **all places with a** municipality, corporation, cantonment board or notified town area committee;

- **all other places which has features as**
  - a minimum population of 5000;
  - at least 75% of the male working population engaged in non-agricultural pursuits and
  - a density of population of at least 400 persons per sq. km. and predominantly urban way of life (urbanism)

Apart from urban area & urban agglomeration rest is considered as Rural Area.

URBAN & RURAL INDIA

CENSUS CLASSIFICTION OF TOWNS & CITIES

Class of Cities/Towns	Range of Population	No. of Towns (Census of India)
Class I	100,000 and above	393
Class II	50,000 to 99,999	401
Class III	20,000 to 49,999	1151
Class IV	10,000 to 19,999	1344
Class V	5,000 to 9,999	888
Class VI	Below 5,000	191

Report of National Commission on Urbanization, vol. One

TYPES OF SURVEYS

REGIONAL SURVEYS

done over a region dealing with

❑ **PHYSICAL FACTORS** like topography, physically difficult land, geology, landscape etc.

❑ **PHYSICAL ECONOMIC FACTORS** like agricultural value of the land, mineral resources and water gathering lands, areas with public services, transportation linkages etc.

❑ **SOCIAL ECONOMIC FACTORS** like areas of influence of towns and villages, employment, population changes etc

TOWN SURVEYS

done at much small scale and apart from the above data collected from the regional surveys it also includes

- **LANDUSE SURVEYS**
- **DENSITY SURVEYS**
- **SURVEYS FOR THE AGE AND CONDITION OF THE BUILDINGS**
- **TRAFFIC SURVEYS**
- **OTHER SOCIAL SURVEYS**

SURVEYING TECHNIQUES

- **SELF SURVEYS -** mailing questionnaires to the persons to be surveyed
- **INTERVIEWS** - by asking questions to the people to be surveyed
- **DIRECT INSPECTION -** when the surveyor himself inspects the situations concerned
- **OBSERVERS PARTICIPATION** - when the observer himself participate in acquiring the data required

SCALES FOR STRUCTURING QUESTIONNAIRE

- **NOMINAL** where there is no ordering, like asking of sex, age, employment in any particular service etc.

- **ORDINAL** where there is a specific order of choices like asking of priorities, housing conditions, climate etc.

- **INTERVAL** where an interval of time is given importance like time taken to shift from LIG housing to MIG housing, time interval to change from two wheelers to four wheelers etc. this provides an yardstick of measurements

SURVEYING TECHNIQUES

SELECTION OF SAMPLES

- More disastrous results - of poor information, larger sample size is required.
- For varied expected responses - larger sample size is required.
- Larger the total population, smaller the percentage of the population are required to be surveyed.

Sample Size – number of persons selected for conducting the survey

Sample – persons that are included in the survey

TYPES OF SAMPLES

- **SIMPLE RANDOM SAMPLING** - selecting samples at random without any criteria to select the samples
- **SYSTEMATIC SAMPLING** -selection of the Kth element along a particular street, where k can be any number
- **STRATIFIED SAMPLING** - making of a homogenous listing of the different sects of the population and collecting a certain percentage at random from each sect
- **CLUSTERED SAMPLING -** when samples are selected from clusters and not from a homogeneous listing

DIFFERENT TYPES OF PLANS

Structural plan	Comprehensive plan	Developmental plan

Structural plan

- A structure plan is one that **singles out for attention of certain aspect of the environment** usually the land-uses, the main movement systems and the location of critical facilities and buildings.
- Such a plan aims to **influence certain key vocational decisions** while recognizing that there are many other things that can't and perhaps should not be decided at the outset.

Comprehensive plan

- The comprehensive plan seeks to combine in one document the **prescriptions for all aspects of city development**.
- It includes an analysis of the city's economy, its demographic characteristics, and the history of its spatial development as a preface to plan for **how the city should evolve over 20 year period**

Developmental plan

- means a **plan for the development or re-development** or improvement of the area within the jurisdiction of a planning authority
- It includes a **regional plan, master plan, detailed development plan and a new town development plan**

GARDEN CITY – Sir Ebenezer Howard…

- Garden City most potent planning model in Western urban planning

- Created by Ebenezer Howard in 1898 to solve urban and rural problems

- Source of many key planning ideas during 20th century
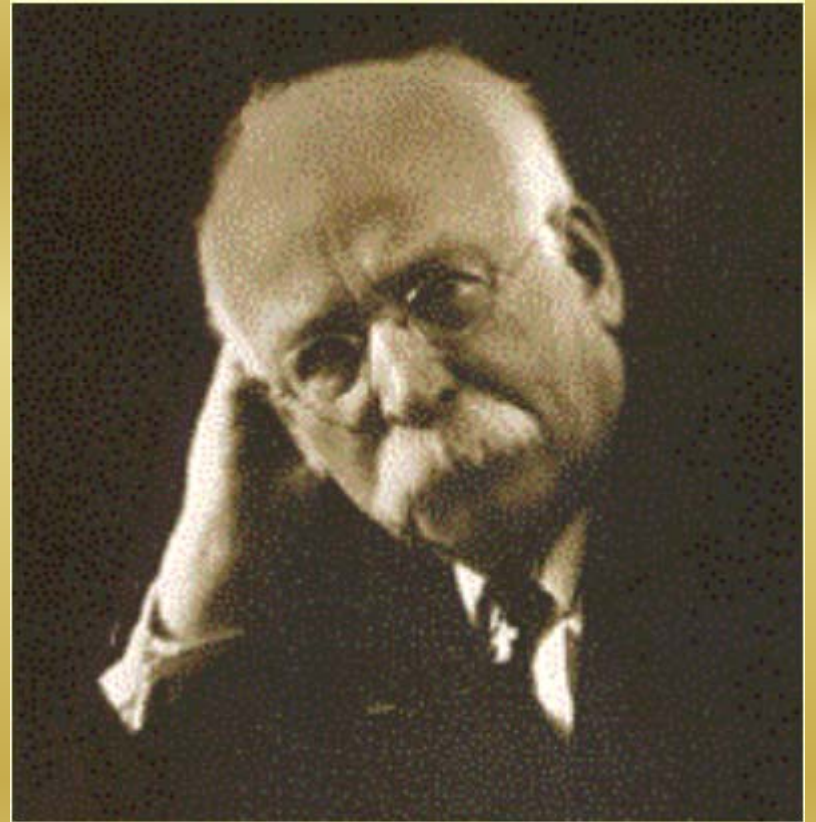
GARDEN CITY – important dates...

1850 - 1928   SIR EBENEZER HOWARD

1899   Published 'Garden City of Tomorrow'

1903   Garden City Association was formed

LETCHWORTH was designed for 35000 persons

1920   WELWYN was designed for 40000 persons

1947   LETCHWORTH had 16000 population & 100 factories
             WELWYN had 18000 population
                                    & 75 factories

UK – Europe – US – rest of the world

THE CONCEPT …

- 'Garden City' – an impressive diagram of **THE THREE MAGNETS** namely the town magnet, country magnet with their advantages and disadvantages and the third magnet with attractive features of both town and country life.

- Naturally people preferred the third one namely Garden City

THE CONCEPT…

- ❑ Core garden city principles
  - ❑ Strong community
  - ❑ Ordered development
  - ❑ Environmental quality

- ❑ These were to be achieved by:
  - ❑ Unified ownership of land to prevent individual land speculation and maximise community benefit
  - ❑ Careful planning to provide generous living and working space while maintaining natural qualities
  - ❑ Social mix and good community facilities
  - ❑ Limits to growth of each garden city
  - ❑ Local participation in decisions about development

THE CONCEPT...

Affordability

- ❑ Howard wanted garden city for **all** incomes
- ❑ Most originally for those of modest incomes
- ❑ Their attractiveness as living environments has often made them become more popular with better off people

Examples of modest income garden city -

- ❑ Kapyla (Helsinki, Finland),
- ❑ Colonel Light Gardens (Adelaide, Australia) and
- ❑ Orechovka (Prague, Czech Republic)

WARD AND CENTRE GARDEN CITY
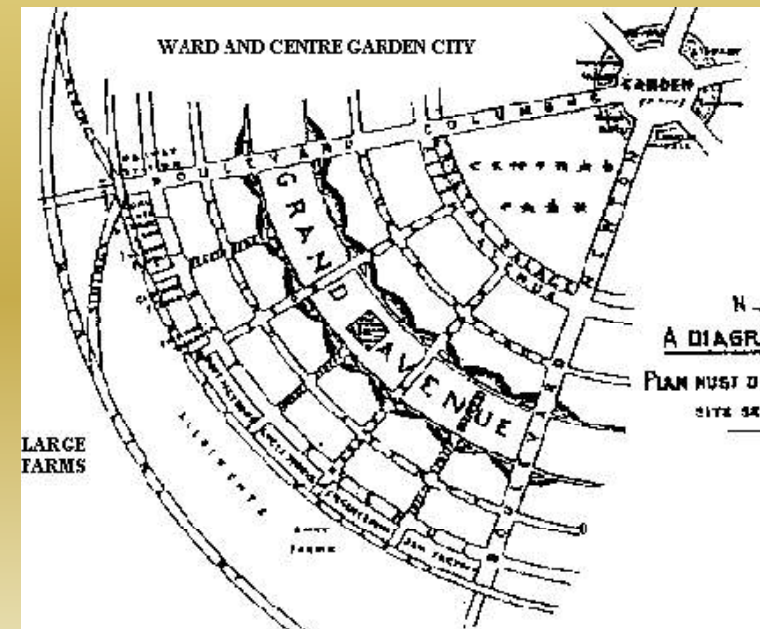
APPLICATION...

- Letch worth – **35** miles from London

- Land of **3822** acres

- Reserved Green belt – **1300** acres

- Designed for a maximum of **35000** population

- In **30** years – developed with **15000** population & **150** shops, industries

LETCHWORTH , UK

Health of the Country
Comforts of the Town

APPLICATION…

- Welwyn– **24** miles from London

- Land of **2378** acres

- Designed for a maximum of **40000** population

- In **15** years – developed with **10000** population & **50** shops, industries

WELWYN ,UK

WELWYN GARDEN CITY
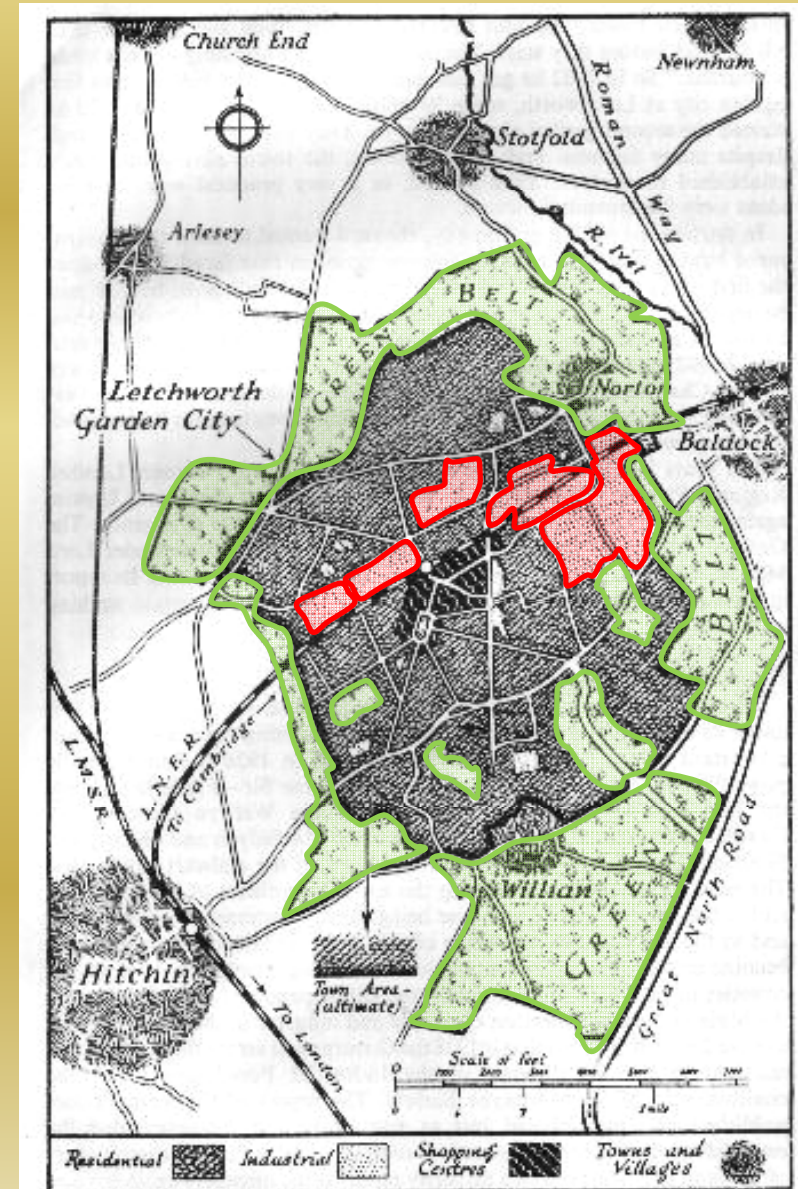
APPLICATION…

Enskede, Stockholm, Sweden (1908-)

Margarethenhohe in Essen, Germany (1908-)

Chemin Vert in Reims, France

APPLICATION...

VALLINGBY, STOCKHOLM

After 1945, the garden city model was mutated into satellite or new towns in many countries . eg in Sweden, UK or Hong Kong.

MILTON KEYNES, UK
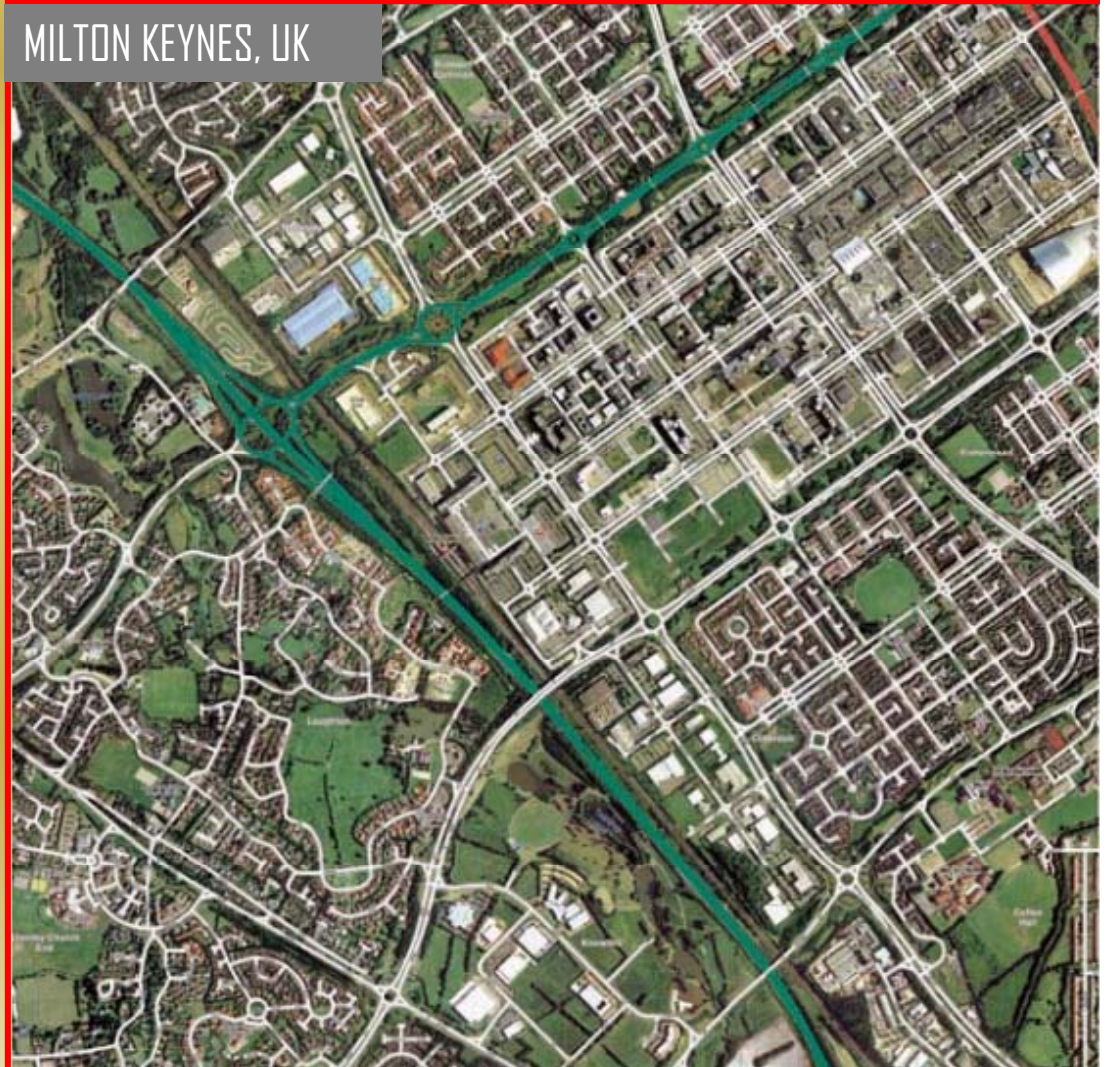
SHATIN, HONG KONG

- Father of modern town planning
- First to link sociological concepts into town planning
- "Survey before plan" i.e. diagnosis before treatment

GEDDISIAN TRIAD– important dates…

1854 - 1932   PATRICK GEDDES

   1886   Settled in EDINBERGH

      1892   Outlook tower - World's first Sociological
                    observatory

         1911   Exhibition on   Cities and Town planning

            1915   Published Cities in Evolution

                    Visited INDIA

               1920 - 23   Professor of Civics and Sociology
                              in University of Bombay

                  1924   Settled in Montpellier, France

GEDDISIAN TRIAD

FOLK (Organism) **WORK (Function)** **PLACE (Environment)**

CITY
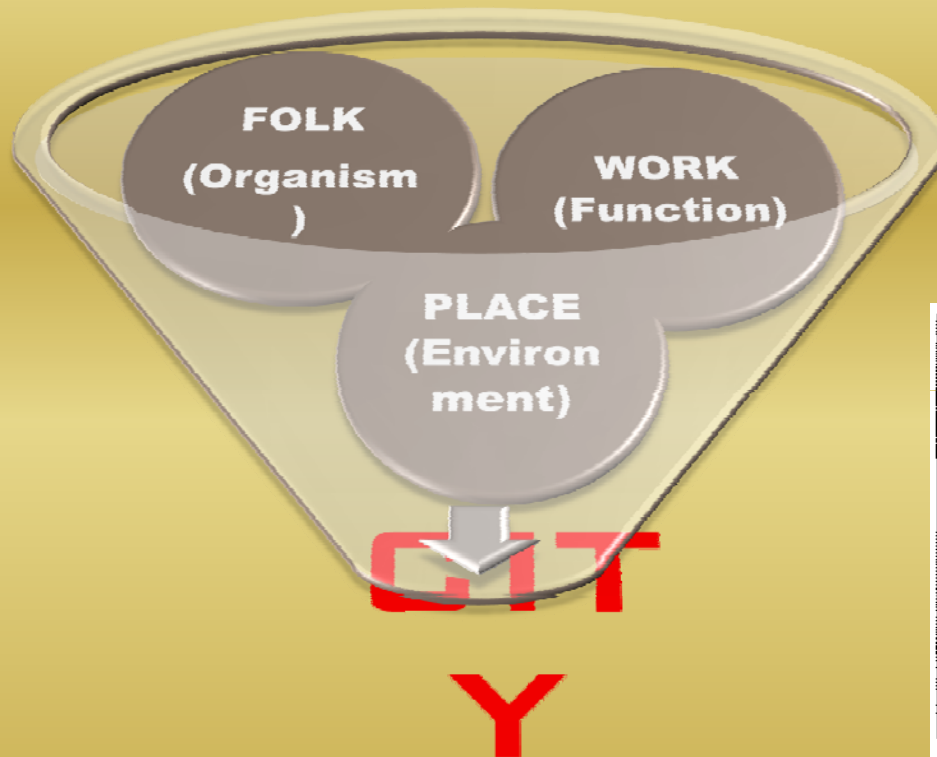
Organic relationship between

SOCIAL , PHYSICAL & ECONOMICAL environment

PLACE (Geography)	place-WORK	place-FOLK
work-PLACE	WORK (Economics)	work-FOLK
folk-PLACE	folk-WORK	FOLK (Anthropology)

feeling-SENSE	feeling-EXPERIENCE	FEELING
experienced-SENSE	EXPERIENCE	experienced-FEELING
SENSE	sensed-EXPERIENCE	sensed-FEELING

Patrick Geddes – Planning concepts

- Rural development, Urban Planning and City Design are not the same and adopting a common planning process is disasturous

- **"Conurbation"** -waves of population inflow to large cities, followed by overcrowding and slum formation, and then the wave of backflow – the whole process resulting in amorphous sprawl, waste, and unnecessary obsolescence.

Patrick Geddes – Planning concepts

LONDON , UK

CONURBATION

DELHI – NCR, INDIA

Patrick Geddes – Planning concepts

- The **sequence of planning** is to be:
  - Regional survey
  - Rural development
  - Town planning
  - City design
- These are to be kept **constantly up to-date**
- He gave his expert advice for the improvement of about 18 major towns in India.

Patrick Geddes – Outlook Tower

- took over 'Short's Observatory' in 1892.

- spectacular views the surrounding city region.

- Positioned at the top is the **Camera Obscura**, which refracts an image onto a white table within, for study and survey.

lens
mirror
(both revolve)

CAMERA OBSCURA

darkened room
circular white table

EDINBURGH

SCOTLAND

ENGLISH SPEAKING COUNTRIES

EUROPE

WORLD
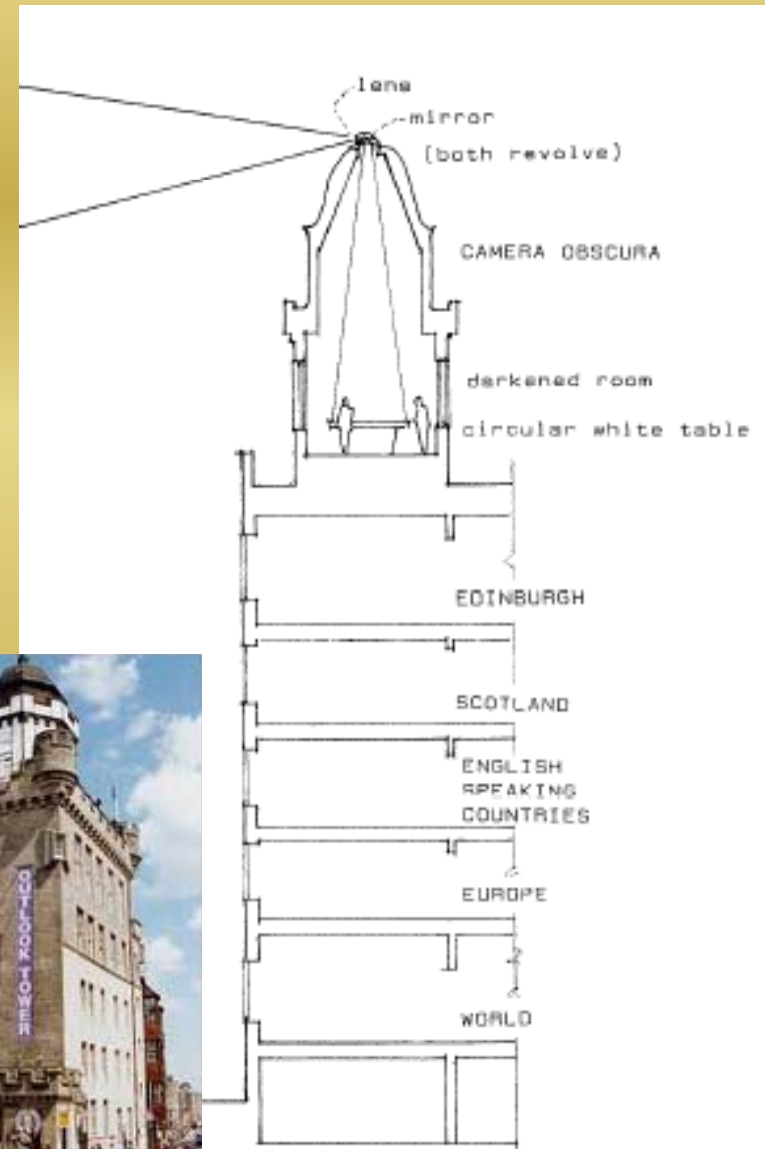
OUTLOOK TOWER

Patrick Geddes – Outlook Tower

- a tool for **regional analysis, index-museum and the 'world's first sociological laboratory'**.

- It represents the essence of Geddes's thought - his holism, visual thinking, and commitment to understanding the city in the region.

- He said of it: *'Our greatest need today is to conceive life as a whole, to see its many sides in their proper relations, but we must have a practical as well as a philosophic interest in such an integrated view of life'.*

- Now the tower is home to the **Patrick Geddes Centre For Planning Studies**, where an archive and exhibition are housed.
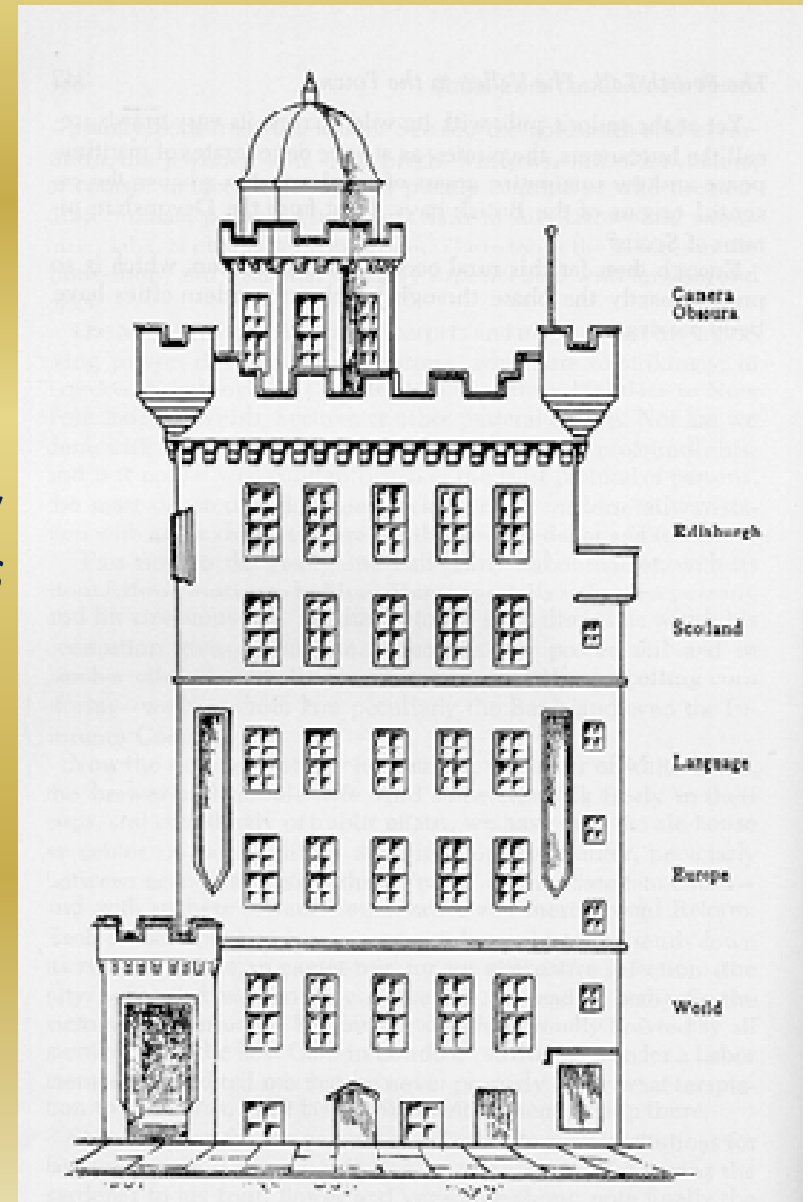
NEIGHBORHOOD UNIT

The neighbourhood is the planning unit for a town.

❑ evolved due to the **advent of industrial revolution and degradation of the city environment** caused due to

    ❑ high congestion,

    ❑ heavy traffic movement through the city,

    ❑ insecurity to school going children,

    ❑ distant location of shopping and recreation activities; etc.

"I used to have a real nice lawn before the cows moved in next door."

OUT OF TOWN SUPERMARKET NOW WITH TOWN BUILT ROUND IT

IF THESE IDIOTS WOULD JUST TAKE THE BUS, I COULD BE HOME BY NOW

NEIGHBORHOOD UNIT

- ❑ to create a safely healthy physical environment in which
    - ❑ children will have no traffic streets to cross on their way to school, schools which are within walking distance from home;

    - ❑ an environment in which women may have an easy walk to a shopping centre where they may get the daily households goods,

    - ❑ employed people may find convenient transportation to and from work.

- ❑ well equipped playground is located near the house where children may play in safety with their friends for healthy development of their mind and spirit.

PRINCIPLES OF NEIGHBORHOOD UNIT

- Unit of Urban Planning
- Street System
- Facilities
- Population
- Sector
- Size and Density
- Neighbourhood Walkways
- Protective Strips

AREA IN OPEN DEVELOPMENT PREFERABLY 160 ACRES -- IN ANY CASE IT SHOULD HOUSE ENOUGH PEOPLE TO REQUIRE ONE ELEMENTARY SCHOOL - EXACT SHAPE NOT ESSENTIAL BUT BEST WHEN ALL SIDES ARE FAIRLY EQUIDISTANT FROM CENTER

A SHOPPING DISTRICT MIGHT BE SUBSTITUTED FOR CHURCH SITE

SHOPPING DISTRICTS IN PERIPHERY AT TRAFFIC JUNCTIONS AND PREFERABLY BUNCHED IN FORM

ONLY NEIGHBORHOOD INSTITUTIONS AT COMMUNITY CENTER

TEN PERCENT OF AREA TO RECREATION AND PARK SPACE

INTERIOR STREETS NOT WIDER THAN REQUIRED FOR SPECIFIC USE AND GIVING EASY ACCESS TO SHOPS AND COMMUNITY CENTER

HIGHWAY — MAIN — HIGHWAY — MAIN

TO CIVIC CENTER

RADIUS — ¼ MILE

TO BUSINESS CENTER — ARTERIAL STREET — TRAFFIC JUNCTION

CLARANCE STAIN's CONCEPTION

- Walking distance radius is one mile.
- In the figure A, elementary school is the centre of the unit and within a one half mile radius of all residents in the neighbourhood, local shopping centres located near the school.
- Residential streets are suggested as CUL-DE-SACS to eliminate through traffic and park space flows into the neighbourhood

RADBURN'S CONCEPT

" *We did our best to follow Aristotle's recommendation that a city should be built to give its inhabitants security and happiness*"- **Clarence Stein**

"*the most significant notion in 20th Century urban development*" – **Anthony Bailey**

"Town for the Motor Age" is truly a "Town for Tomorrow"

"*social planning of an advanced order. It is manipulation of physical elements to induce and encourage a social and human goal. It is a kind of planning which recognizes that the growing edge of civilization is in the human and not the mechanical direction, though the mechanical factors must be carefully aligned and allocated to support and advance the communal achievements and the social inventions of a free people of autonomous family life.*" – **James Dahir**

the first major advance in city planning since Venice - **Lewis Mumford**

RADBURN's Planning

1929 Radburn Created

25000 people

149 acres

430 single houses

90 row houses

54 semi attached houses

93 apartment units

conceived by
CLARANCE STEIN &
HENRY WRIGHT

Factors that influenced
- Rapid Industrialisation after World War I
- Migration of Rural to Cities
- Dramatic growth of Cities
- Housing Shortage
- The need to provide housing and protect from motorised traffic

RADBURN's Planning – INSPIRATION...

Henry Wright's "Six Planks for a Housing Platform"

- ❑ Plan simply, but **comprehensively**. Don't stop at the individual property line. Adjust paving, sidewalks, sewers and the like to the particular needs of the property dealt with - not to a conventional pattern. Arrange buildings and grounds so as to give **sunlight, air and a tolerable outlook to even the smallest and cheapest house.**

- ❑ Provide **ample sites** in the right places for **community use**: i.e., playgrounds, school gardens, schools, theatres, churches, public buildings and stores.

- ❑ Put factories and other **industrial buildings** where they can be used **without wasteful transportation** of goods or people.

- ❑ Cars must be parked and stored, deliveries made, waste collected (**Vehicular Movement**) - plan for such services with a **minimum of danger, noise and confusion**.

- ❑ **Relationship between buildings**. Develop collectively such services as will add to the comfort of the individual, at lower cost than is possible under individual operation.

- ❑ Arrange for the **occupancy of houses** on a **fair basis of cost and service,** including the cost of what needs to be done in organizing, building and maintaining the community.

RADBURN'S CONCEPT

❑ **SEPARATION** of pedestrian and vehicular traffic

❑ **SUPER BLOCK** - large block surrounded by main roads

❑ houses grouped around small **CUL DE SACS** - each accessed from main road, Living, Bedroom faced gardens & parks, service areas to **ACCESS ROADS**

❑ remaining land - **PARK AREAS**

❑ **WALKWAYS** - designed such that pedestrians can reach social places without crossing automobile street

GLEN ROCK
Border

ERNIE Rail
Road

Saddle

SADDLE BROOK

TOWN PLAN
RADBURN. N.J.

SCHOOLS   APARTMENTS   HOUSES   THEATRE

STORES   PLAYGROUNDS   PARKS   INDUSTRY

FIG. 15
RADBURN, NEW JERSEY—PLAN OF MODEL COMMUNITY
[134]

Courtesy of the City Housing Corporation
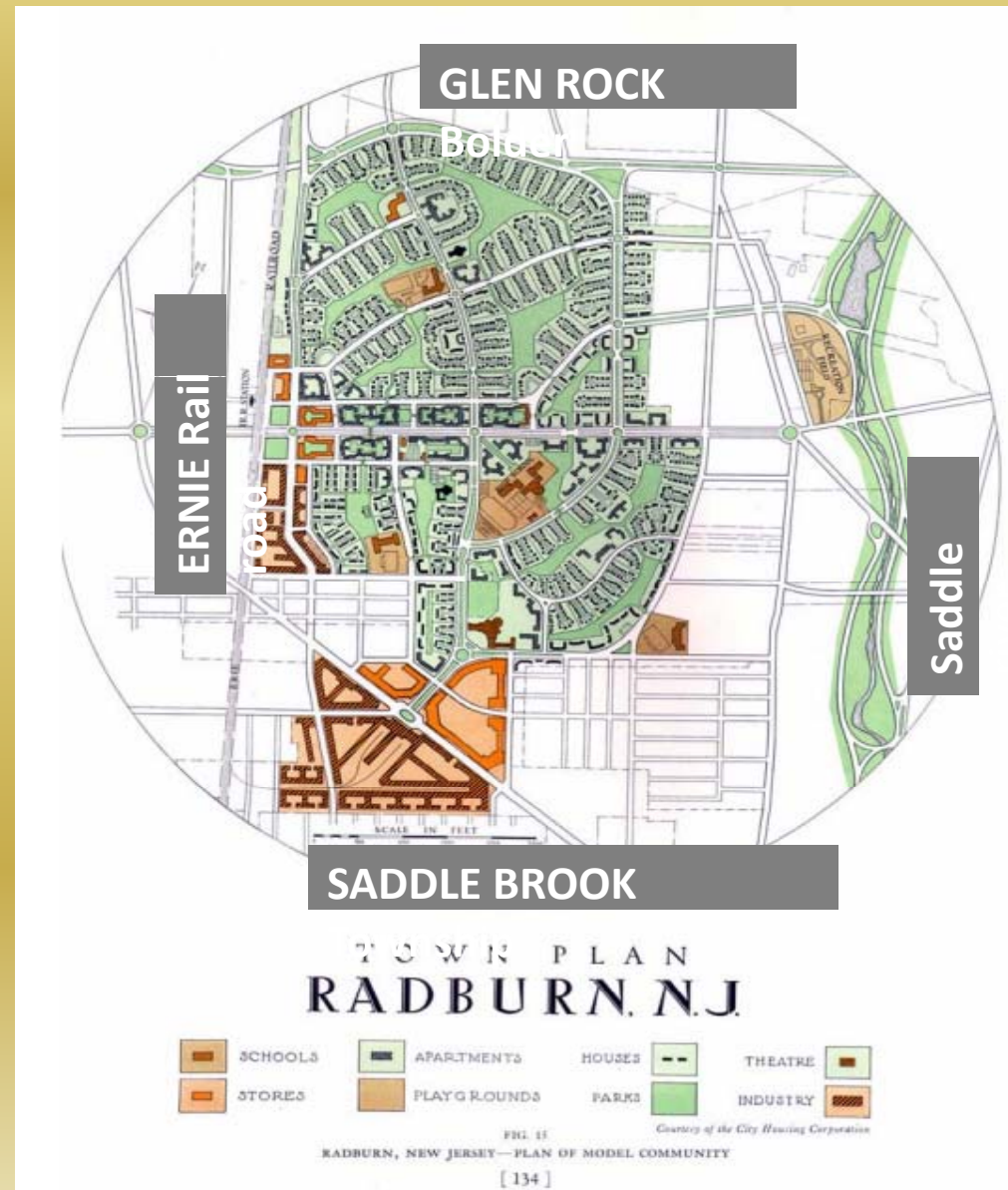
RADBURN'S CONCEPT

FINANCIAL PLANNING

❑ Parks without additional cost from Residents

❑ Savings from minimising roads - requires less road area

❑ 25% less area gave 12-15% of total park area
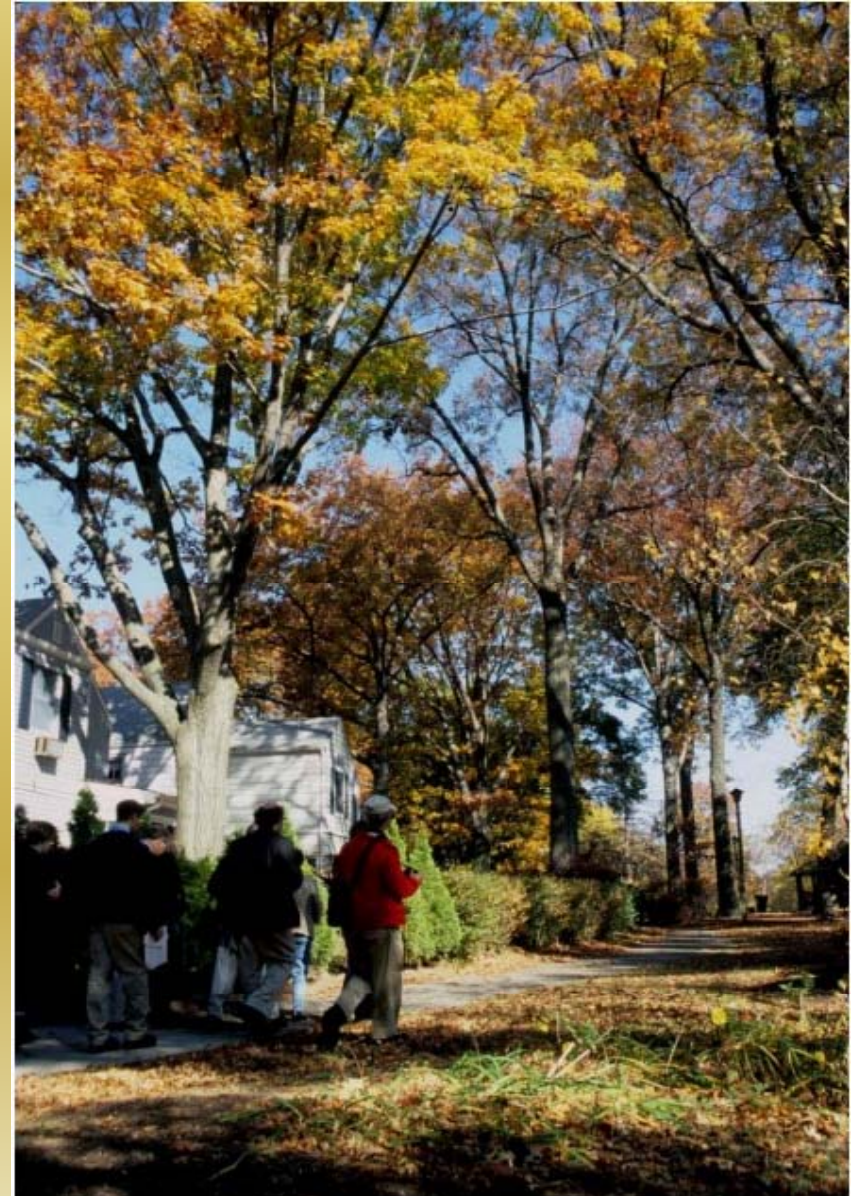
RADBURN'S CONCEPT - applications

- **US**
  - **Baldwin Hills**
  - **Los Angels**
  - **Kitimat B.C**

- **England** - post WWII –
  - **Coventry,**
  - **Stevenage,**
  - **Bracknell and**
  - **Cumbermauld**

- **Sweden** –
  - **Vallingby,**
  - **Baronbackavna Estate, Orebro &**
  - **Beskopsgaden Estate Goteborg**

- **Chandigarh**, **India**
- **Brazilia**, **Brazil**
- Several towns in **Russia**
- Section of **Osaka** , **Japan**
- **Wellington**, **New Zealand**

- **US** - **Reston, Virginia & Columbia, Maryland**

EKISTICS

- Ekistics is the study of **human settlement**, which examines not only built forms, but also the interface of time, movements and systems in the built environment.

- Doxiadis saw ekistics as an **intellectual approach** to **balance** the convergence of the past, present, and future in human settlements as well as a **system** for **creatively coping** with the growth of population, rapid change and the pressures of large-scale, high-density housing.

EKISTICS

❑ Ekistics Lograthamic Scale (ELS)

❑ ELS consists of 15 Ekistic Units ranging from Man to Ecumenopolis

❑ Classified under 4 major types

  ❑**Minor shells**, or elementary units (man, room, house)

  ❑**Micro-settlements,** the units smaller than, or as small as, the traditional town where people used to and still do achieve interconnection by walking

  ❑**Meso-settlements,** between the traditional town and the conurbation within which one can commute daily

  ❑**Macro-settlements,** whose largest possible expression is the Ecumenopolis,

MAN

ROOM

DWELLING

NEIGHBOURHOOD

TOWN

CITY

METROPOLIS

CONURBATION

MEGALAPOLIS

URBAN REGION

ECUMENAPOLIS

EKISTICS UNITS

NATURE	MAN	SOCIETY	SHELL	NETWORKS
▪ Geological resources ▪ Topographical resources ▪ Soil resources ▪ Water resources ▪ Plant life ▪ Animal life ▪ Climate	▪ Biological needs (space, air, temperature, etc.,) ▪ Sensation and perception (the 'five senses') ▪ Emotional needs (human relations, security, beauty, etc.) ▪ Moral values	▪ Population composition and density ▪ Social stratification ▪ Cultural patterns ▪ Economic development ▪ Education ▪ Health and welfare ▪ Law and administration	▪ Housing ▪ Community services (schools, hospitals, etc.) ▪ Shopping centers and markets ▪ Recreational facilities ▪ Civic and business centers (town hall, law-courts, etc.) ▪ Industry ▪ Transportation centers	▪ Water supply systems ▪ Power supply systems ▪ Transportation systems (water, road, rail, air) ▪ Communication systems (telephone, radio, TV etc.) ▪ Sewerage and drainage ▪ Physical layout (Ekistic plan)

EKISTICS – Nature & Goals of Settlement

Five elements forms a System

Goal - make man happy and safe.

Primary

Secondary

Tertiary

Man

Nature

Society

Network

Shells
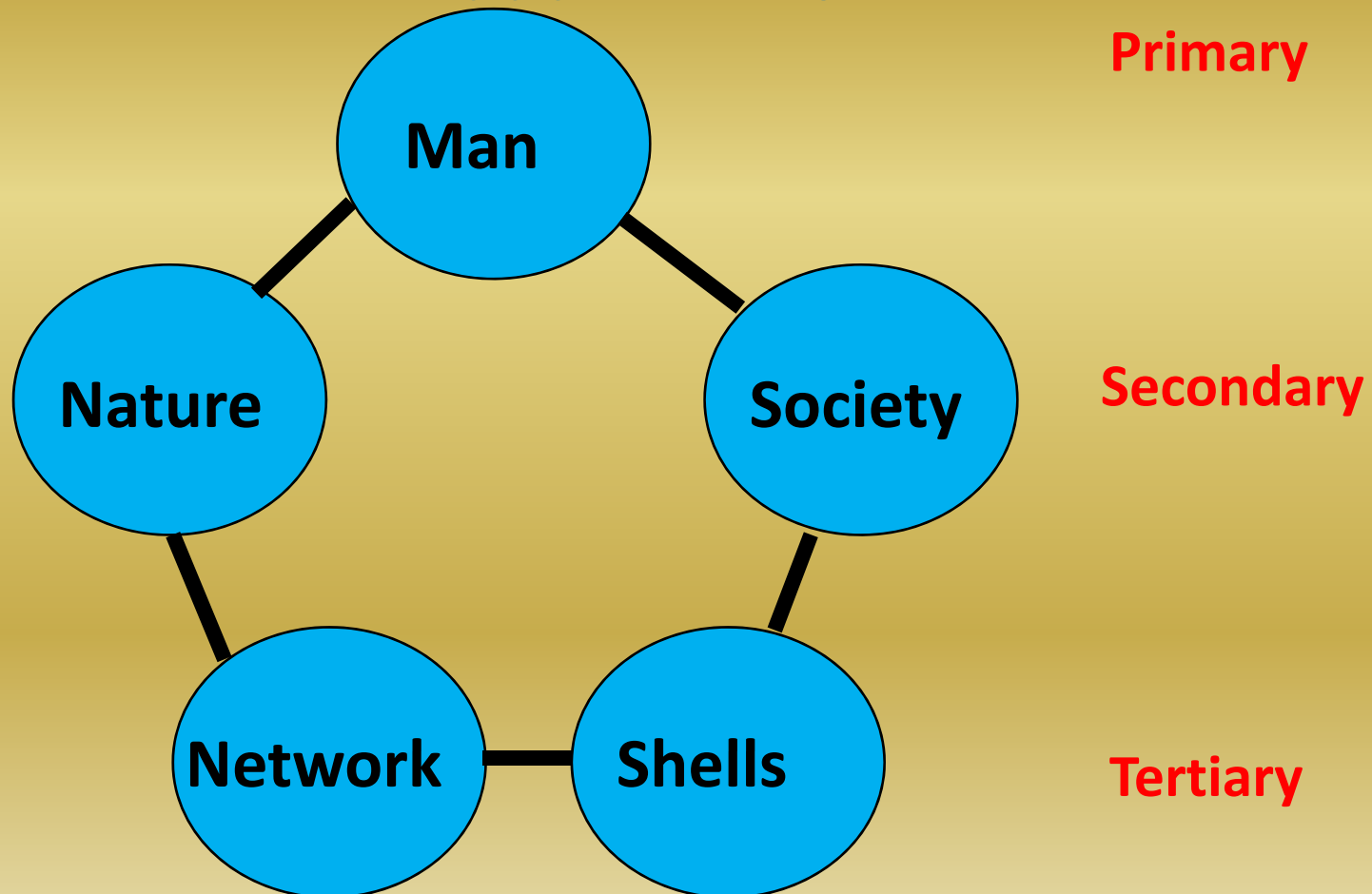
Yesterday — Living and Working in the Smoke
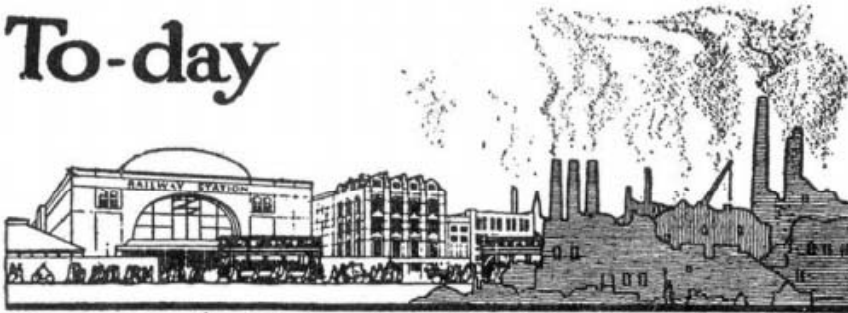
To-day — Living in the Suburbs – Working in the Smoke

To-morrow — Living & Working in the Sun at WELWYN GARDEN CITY

SATELLITE TOWNS

A satellite town or
satellite city is a concept
in urban planning that
refers essentially to
miniature metropolitan
areas on the fringe of
larger ones

SATELLITE TOWNS ROUND LONDON
A DIAGRAM SHEWING HOW IT COULD BE DONE.
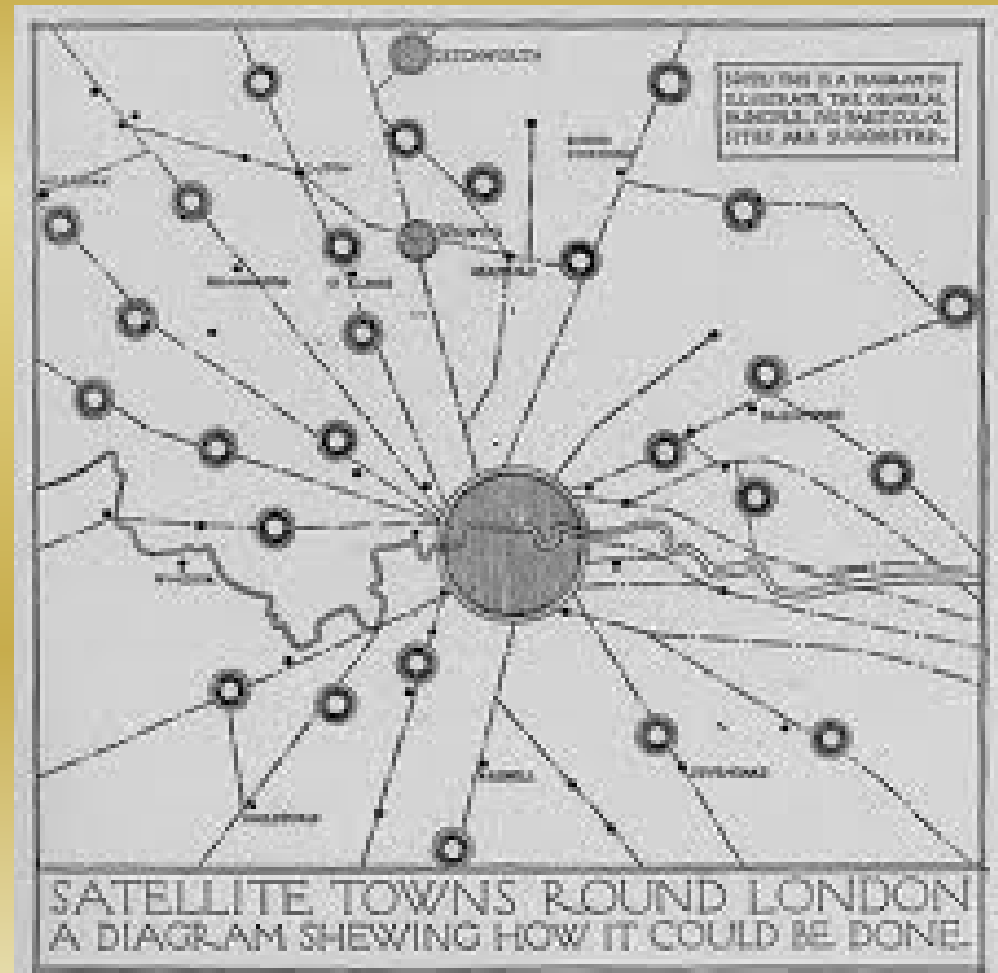
SATELLITE TOWNS

Characteristics

- Satellite cities are small or medium-sized cities **near** a **large metropolis**, that are
- Predate that metropolis' **suburban expansion**;
- Are at least **partially independent** from that metropolis **economically and socially**;

- Are **physically separated** from the metropolis by rural territory; satellite cities should have their own **independent urbanized area**, or equivalent;
- Have their **own bedroom communities**;
- Have a traditional **downtown surrounded** by traditional "inner city" neighborhoods;
- **May or may not be counted** as part of the large metropolis' **Combined Statistical Area**

RIBBON DEVELOPMENT

- **Ribbon development** means building houses along the routes of communications radiating from a human settlement.

- Such development generated great concern in the UK during the 1920s and 30s, as well as in numerous other countries.

- Following the Industrial revolution, ribbon development became prevalent along railway lines - predominantly in the UK, Russia, and United States.

- A good example of this was the deliberate promotion of Metroland along London's Metropolitan railway.

- Similar evidence can be found from Long Island (where Frederick W Dunton bought much real estate to encourage New Yorkers to settle along the Long Island Railroad lines), Boston and across the American mid-west

- Ribbon development can also be compared with a linear village which is a village that grew along a transportation route, not as part of a city's expansion.
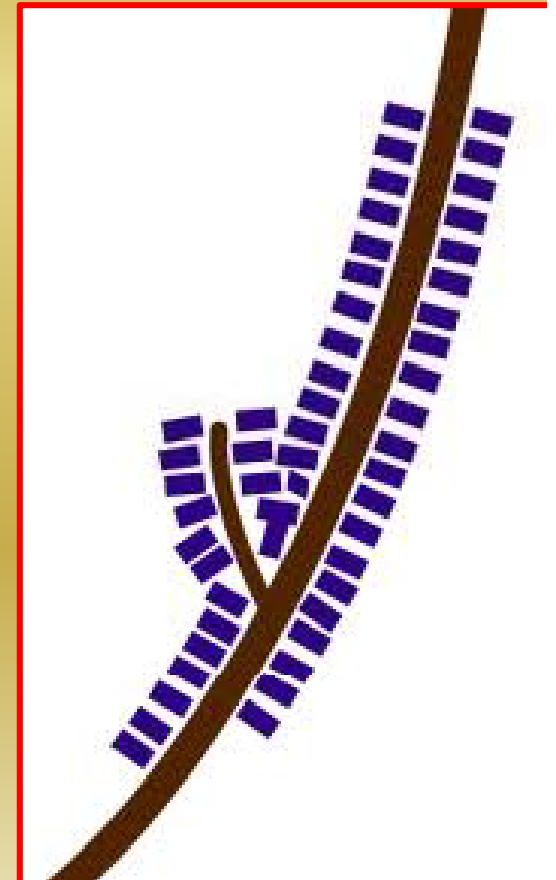
UNIT II

ANCIENT SYSTEM OF TOWN PLANNING IN INDIA

CT.Lakshmanan B.Arch., M.C.P.
AP(SG)/Architecture

TOPICS TO BE COVERED

- **INDUS VALLEY CIVILIZATION**
  - MOHENJADORO
  - HARAPPA
- **EXTRACTS FROM CHANAKYA'S ARTHASASTRA**
  - REGIONAL CONCEPTS
  - MANASARA VASTU SASTRA
    - 8 TOWN PLANNING CONCEPTS
- **PLANNING CONCEPTS BEHIND**
  - FATEHPUR SIKHRI
  - SHAHJAHANABAD
  - JAIPUR
  - DELHI

INDUS VALLEY CIVILIZATION
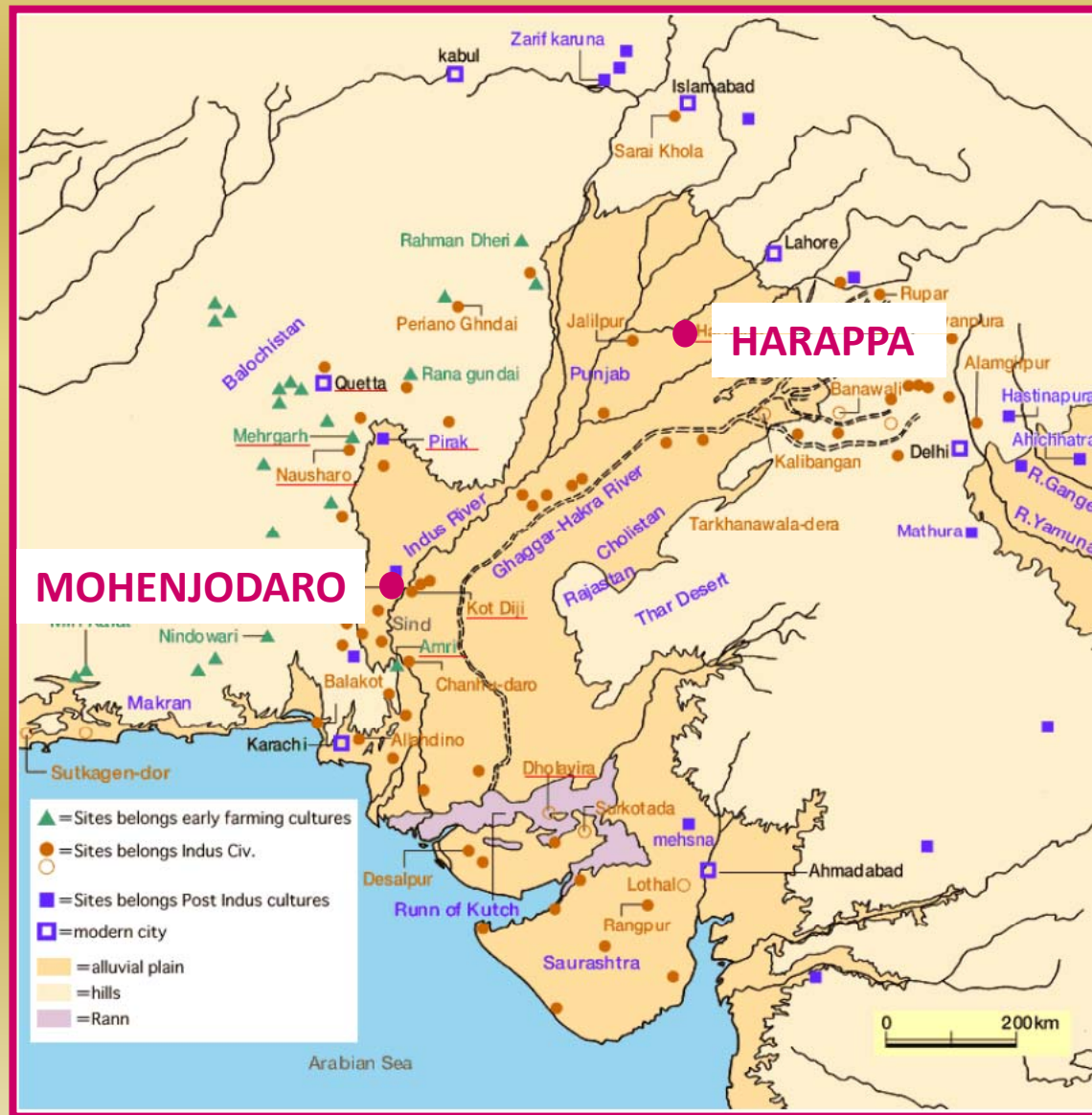
- Also referred to as **HARAPPAN CIVILIZATION & SARASWATHI SINDHU CIVILIZATION**
- Between **INDUS RIVER AND THE GHAGGAR-HAKRA RIVER** [Pakistan and North Western India]

TOWN PLANNING CONCEPT

- SOPHISTICATED & ADVANCED URBAN CULTURE
- STREETS IN PERFECT GRID PATTERNS IN BOTH MOHENJODORO & HARAPPA
- WORLD'S FIRST SANITATION SYSTEM
- INDIVIDUAL WELLS AND SEPARATE COVERED DRAINS ALONG THE STREETS FOR WASTE WATER
- HOUSES OPENED TO INNER COURTYARDS & SMALLER LANES
- IMPRESSIVE DOCKYARDS, GRANERIES, WAREHOUSES, BRICK PLATFORMS & PROTECTIVE WALLS
- MASSIVE CITADELS PROTECTED THE CITY FROM FLOODS & ATTACKERS
- CITY DWELLERS – TRADERS & ARTISANS
- ALL THE HOUSES HAD ACCESS TO WATER & DRAINAGE FACILITIES

INDUS VALLEY CIVILIZATION

<u>DEVELOPMENT OF CITIES</u>

- CITIES GREW OUT OF EARLIER VILLAGES THAT EXISTED IN THE SAME LOCALITY FOR < 100 YRS
- GREW IN SIZE & DENSITY AND SURROUNDED BY NUMEROUS TOWNS & VILLAGES
- CITIES INTERLINKED BY TRADE & ECONOMIC ACTIVITIES, RELEGIOUS BELIEFS, SOCIAL RELATIONS,ETC
- VAST AGRICULTURAL LANDS, RIVERS & FORESTS BY PASTORAL COMMUNITIES , FISHER FOLK AND HUNTERS SURROUNDED EACH CITY

INDUS VALLEY CIVILIZATION

DEVELOPMENT OF CITIES

- CLASSIFICATION OF TOWNS
  - Small villages / hamlets – 0 – 10 hectares
  - Large towns – 10- 50 hectares
  - Cities – 50 hectares

- IMPORTANT CITIES

CITY	SIZE IN HECTARES	POPULATION
MOHENJODARO	200	35-41000
HARAPPA	150	23500
GANWERIWALA	80	
RAKHIGARHI	80	
DHOLAVIRA	100	
REHMAN DEHRI	22	12000

MOHENJO-DARO
THE CITADEL
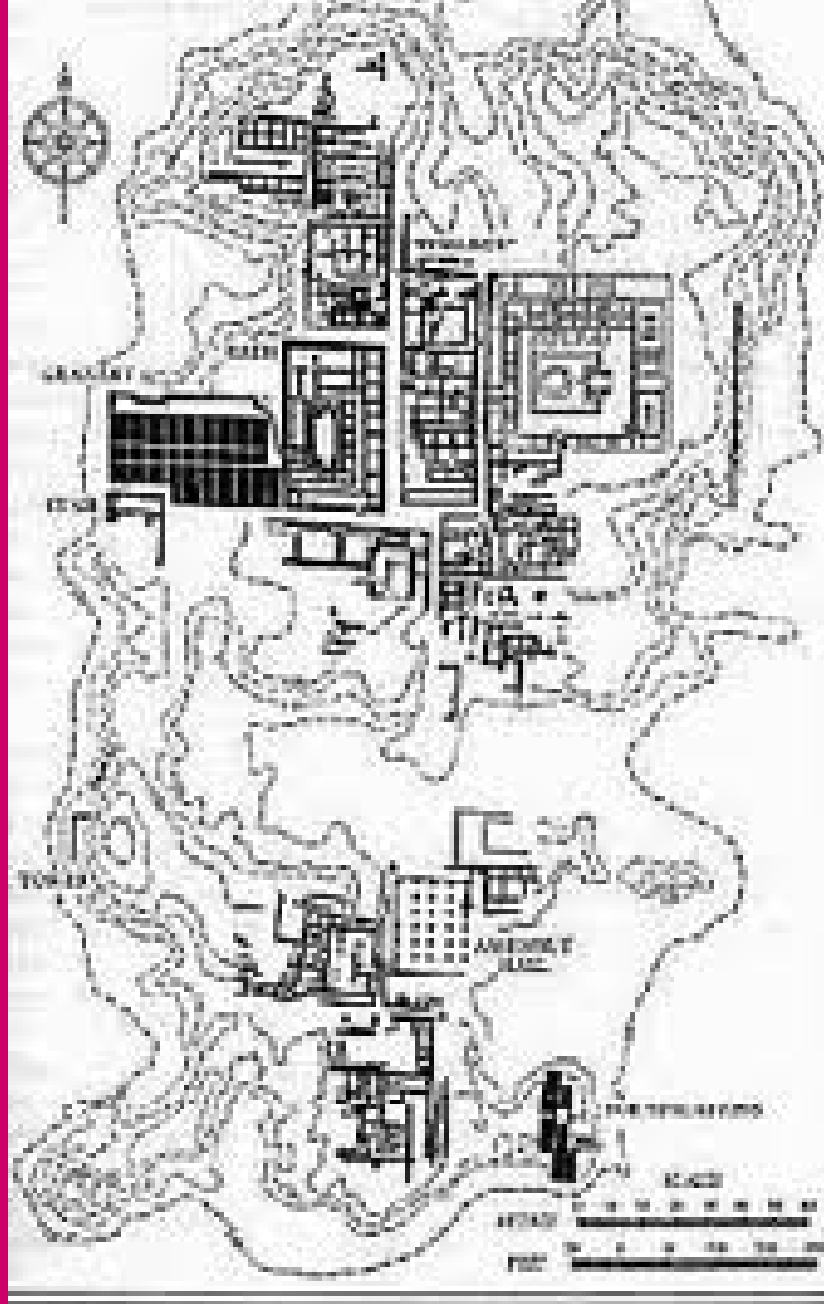
- NO FORTIFICATION
- MAJOR STREETS IN NORTH SOUTH DIRECTION
- INTERSECTION AT RIGHT ANGLES
- STREETS WITHIN BUILT UP AREAS WERE NARROW
- DISTINCT ZONING FOR DIFFERENT GROUPS
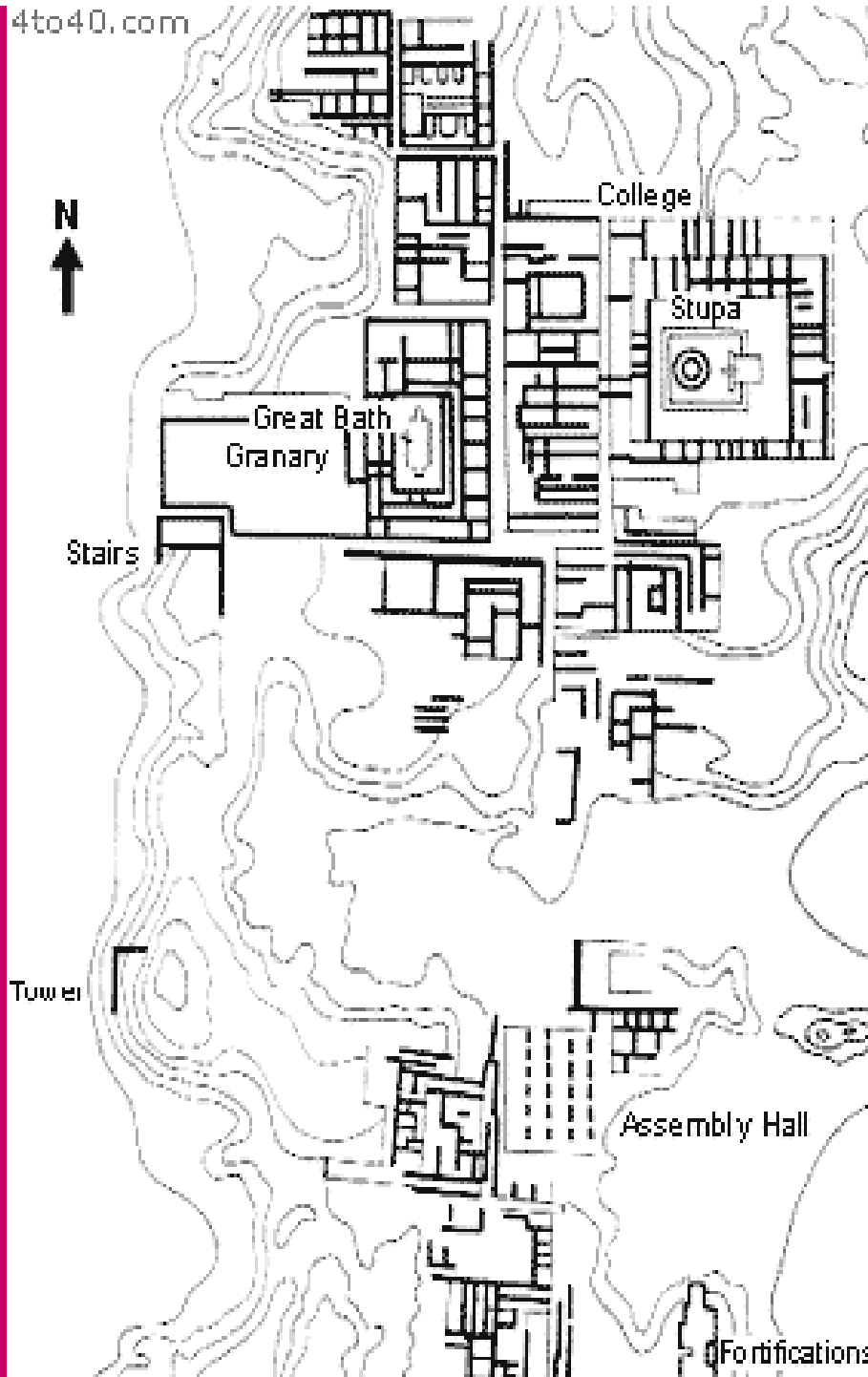
SETTLEMENT DIVISIONS

- ❑ RELEGIOUS, INSTITUTIONAL & CULTURAL AREAS – AROUND MONASTERY & GREAT BATH IN THE WESTERN PART
- ❑ NORTH – AGRICULTURE & INDUSTRIES
- ❑ SOUTH – ADMINISTRATION, TRADE & COMMERCE

MOHENJODARO

CONSTRUCTION TECHNIQUES

- BUILDINGS – MASONRY CONSTRUCTION BY SUN DRIED BRICKS
- RANGING FROM 2 ROOMS TO MANSIONS WITH MANY ROOMS
- UNDERGROUND SEWERAGE & DRAINAGE FROM HOUSES
- HELICAL PUMPS FOR PUMPING WATER IN GREAT BATH
- PRINCIPAL BUILDINGS – MONASTRY & BATH - INDICATING RELIGIOUS CULTURE

MOHENJODARO

GREAT BATH

- 12x7x3 M IN DIMENSIONS
- EARLIEST PUBLIC WATER TANK IN ANCIENT WORLD
- LEDGE EXTENDS FOR THE ENTIRE WIDTH OF POOL
- WATERTIGHT FLOOR – THICK LAYER OF BITUMEN
- FLOOR SLOPES IN SOUTH WEST CORNER WITH A SMALL OUTLET CONNECTING TO A BRICK DRAIN
- ROOMS LOCATED IN THE EAST
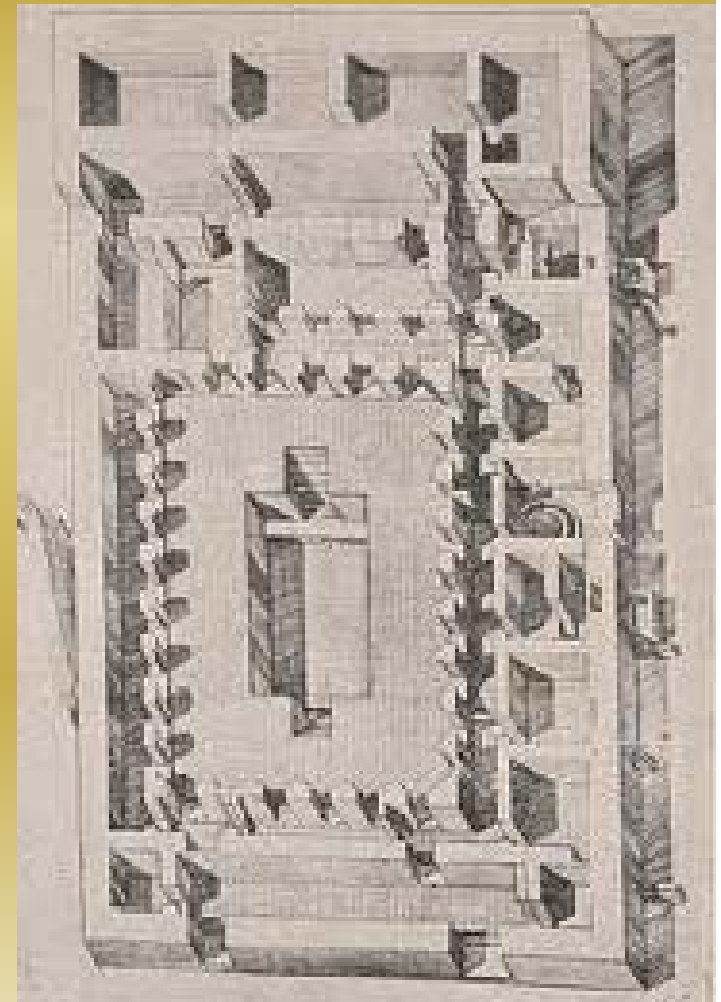
MOHENJODARO
GRANARY

- 50x40 M IN DIMENSION, 4.5 M TALL

- MASSIVE MUD BRICK FOUNDATION

- 2 ROWS OF SIX ROOMS ALONG A CENTRAL PASSAGEWAY [7M WIDE & PAVED WITH BAKED BRICKS]

- EACH ROOM 15.2x6.1 M HAS 3 STEEPER WALLS WITH AIRSPACE BETWEEN

- A WOODEN SUPERSTRUCTURE SUPPORTED IN SOME PLACES BY LARGE COLUMNS WOULD HAVE BEEN BUILT ON TOP OF THE BRICK FOUNDATIONS, WITH STAIRS LEADING UP FROM THE CENTRAL PASSAGE AREA.

- SMALL TRIANGULAR OPENIGS – AIR DUCTS FOR FRESH AIR BENEATH HOLLOW FLOORS

- THE LARGE SIZE OF THE GRANARY PROBABLY INDICATES A HIGHLY DEVELOPED AGRICULTURAL CIVILIZATION

"Granary," Harappa.

J.M. Kenoyer
@ www.harappa.com
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HARAPPA

- 23000 POPULATION
- 150 HECTARES
- EARLIEST CITY MAY HAVE BEEN FORMED DURING THE KOT DIJI PHASE, I.E., 2800-2500 BC
- EARLIEST CITY COVERED AN AREA OF 25 HA.
- IT BECAME A CENTRE FOR TRADE NETWORKS EXTENDING FROM BALUCHISTAN AND AFGHANISTAN TO THE WEST OF THE SEACOAST IN THE SOUTH.
- TOWNS BUILT OVER RAISED MUD BRICK PLATFORMS

HARAPPA

TOWN PLANNING

- CITADEL MOUND AND LOWER TOWN SURROUNDED BY A MASSIVE BRICK WALL.

- CITADEL HAD SQUARE TOWERS AND BASTIONS.

- LARGE OPEN AREAS INSIDE THE GATEWAY MAY HAVE BEEN USED AS A MARKET OR CHECKPOINT FOR TAXING GOODS COMING INTO THE CITY

- OUTSIDE THE CITY WALLS A CLUSTER OF HOUSES MAY REPRESENT TEMPORARY REST STOPS FOR TRAVELLERS AND CARAVANS

- NO DIVISION OF THE SOCIETY IS REFLECTED IN THE LAYOUT OF THE CITY. SINCE LARGE PUBLIC BUILDINGS, MARKET AREAS, LARGE AND SMALL HOUSES AS WELL AS CRAFT WORKSHOPS HAVE BEEN FOUND IN THE SAME NEIGHBOURHOOD.

- BARRACK-LIKE GROUP OF SINGLE-ROOMED TENEMENTS WERE FOR THE POORER CLASSES

TOWN PLANNING

- Basic house plans
  - single room tenements
  - houses with courtyards
- Houses - rooms on 3 sides opening into a central courtyard
- Nearly all large houses had private wells.
- Hearths (brick- or stone-lined fireplace or oven often used for cooking and/or heating) common in rooms.
- Bathrooms in every house with chutes leading to drainage channels.
- First floor bathrooms also built.
- Brick stairways provided access to the upper floors.
- Houses built with a perimeter wall and adjacent houses were separated by a narrow space of land.
- Granary with areas for threshing grains.
- Burnt bricks mainly used for drains, wells and bathrooms.
- Sun dried bricks used mainly for fillings.
- Timber used for flat roofs and as frames or lacing for brickwork

HARAPPA
ARCHITECTURE

- BUILDING MATERIALS - MUD BRICKS AND BAKED BRICKS, WOOD AND REEDS.

- THE AVERAGE SIZE OF THE BRICKS WAS 7 X 12 X 34 CM (FOR HOUSES) AND 10 X 20 X 40 CM FOR THE CITY WALLS. THE LARGER BRICKS HAVE A STANDARD RATIO OF 1:2:4.

- MUD BRICK, BAKED BRICK & WOOD OR STONE WERE USED FOR THE FOUNDATION AND WALLS OF THE HOUSES.

- THE DOORS ,WINDOWS WERE MADE FROM WOOD AND MAT.

- HOUSE FLOORS -HARD-PACKED EARTH

- BATHING AREAS AND DRAINS - BAKED BRICK AND STONE.

- ROOFS -WOODEN BEAMS COVERED WITH REEDS AND PACKED CLAY.

- LARGEST BUILDINGS MADE ENTIRELY OF WOOD.

- WINDOWS – SHUTTERS & LATTICE WORK

HARAPPA

ARCHITECTURE : LARGE PUBLIC STRUCTURES

- LARGE BUILDINGS -ADMINISTRATIVE OR RITUAL STRUCTURES.

- ACCESS ROUTES OR PROVIDED THOROUGHFARE FROM ONE AREA TO ANOTHER.

- MARKETS AND PUBLIC MEETINGS HELD IN LARGE OPEN COURTYARDS.

- HOUSES AND PUBLIC BUILDINGS GROUPED WITH SHARED WALLS AND FORMED LARGER BLOCKS & ACCESSED BY WIDE STREETS.

- MOST HOUSES HAD PRIVATE BATHS &TOILETS AS WELL AS PRIVATE WELLS.

HARAPPA

DRAINAGE SYSTEM

- WELLS AND RESERVOIRS - DRINKING AND BATHING.

- WELLS WERE LINED WITH SPECIALLY-MADE WEDGE-SHAPED BRICKS TO FORM A STRUCTURALLY SOUND CYLINDER.

- ROPES WERE USED TO LIFT THE WATER OUT, PROBABLY WITH LEATHER OR WOODEN BUCKETS.

- SOME NEIGHBOURHOODS HAD COMMUNAL WELLS.

HARAPPA

DRAINAGE SYSTEM

- BATHING PLATFORMS WITH WATER TIGHT FLOOR & DRAINS [OPEN OUT TO LARGER DRAINS IN STREETS] PROVIDED IN ROOMS ADJACENT TO THE WELLS.

- DRAINS AND WATER CHUTES IN THE UPPER STOREYS WERE OFTEN BUILT INSIDE THE WALL WITH AN EXIT OPENING JUST ABOVE THE STREET DRAINS.

- TAPERED TERRACOTTA DRAINPIPES WERE USED TO DIRECT WATER OUT TO THE STREET.

- MANY HOUSES HAD DISTINCT TOILETS, SEPARATE FROM THE BATH AREAS.

- COMMODES WERE LARGE JARS OR SUMP POTS SUNK INTO THE FLOORS AND MANY OF THEM CONTAINED A SMALL JAR.

- DRAINS COVERED WITH BAKED BRICKS OR DRESSED STONE BLOCKS. GARBAGE BINS WERE PROVIDED ALONG THE MAJOR STREETS.

CHANAKYA'S ARTHASASTHRA

- CONGESTED Town, SHOULD BE FREED OF SURPLUS POPULATION, WHICH SHOULD THEN BE HOUSED IN A NEW PLACE.

- TOWNS POSITIONED TO HELP EACH OTHER.

- 'SANGRAHAN' (COLLECTION REGISTER / TAX COLLECTOR) - 10 VILLAGES, 'SARVATIK' AMONG 200, 'DRONAMUKH' (CHIEF) AMONG 400 AND 'STHANIYA' AMONG 800

- MIGRATED PEOPLE IN NEW SETTLEMENT EXEMPTED FROM PAYMENT OF TAXES FOR SOME YEARS.

- NEW VILLAGE –
    - HIGHER PROPORTION OF AGRICULTURISTS AND SHUDRAS.
    - MARKET - SALE OF GOODS RECEIVED FROM TRADERS ON HIGHWAYS.
    - DAMS - CONSTRUCTED OVER RIVERS NALAS.
    - TEMPLES AND GARDENS SHOULD BE PROVIDED.
    - ARRANGEMENTS FOR THE AGED, THE CHILDREN AND INFORMAL PERSONS.
    - CEREALS AND WEALTH WILL GROW IF THE AGRICULTURISTS ARE KEPT BUSY. ATTEMPTS SHOULD BE MADE TO PROTECT AND INCREASE QUARRIES, FORESTS AND CANALS.

TOWN PLANNING
CHANAKYA'S ARTHASASTHRA

- A CITY - LOCATED CENTRALLY TO FACILITATE TRADE AND COMMERCE.

- THE SITE - LARGE IN AREA, AND NEAR A PERENNIAL WATER BODY .

- SHAPE - CIRCULAR, RECTANGULAR OR SQUARE AS WOULD SUIT THE TOPOGRAPHY.

- SEPARATE AREAS FOR MARKETING DIFFERENT GOODS.

- WALL AROUND THE TOWN, - 6 DANDAS HIGH AND 12 DANDAS WIDE. BEYOND THIS WALL THERE SHOULD BE THREE MOATS OF 14', 12'AND 10' WIDE TO BE CONSTRUCTED FOUR ARM-LENGTHS APART. DEPTH – 3/4TH OF WIDTH.

- THREE-EAST WEST AND THREE NORTH – SOUTH ROADS, SHOULD DIVIDE THE TOWN.

- THE MAIN ROADS SHOULD BE 8 DANDAS WIDE AND OTHER ROADS 4 DANDAS WIDE.

- 1 WELL FOR 10 HOUSES.

DEPRESSED CLASS

CEMETRIES

FOREST, FOREST GOODS

PALACE & TEMPLES

TRADERS / SKILLED WORKERS KSHATRIYAS

TREASURY / GOLDSMITHS / INDUSTRIES / DOCTORS,/ ARTISTS

PRIEST & MINISTERS
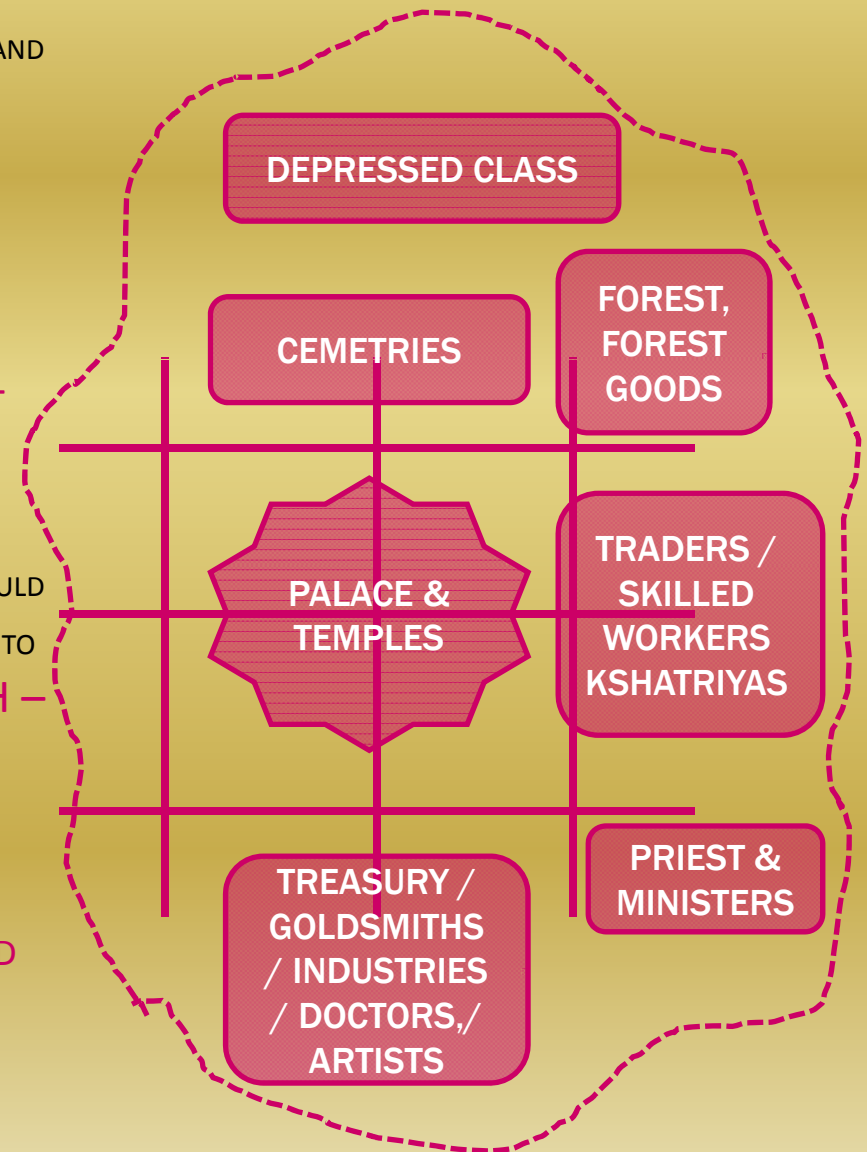
ANCIENT TOWN CLASSIFICATION

- Dandaka

- Sarvathobhadra

- Nandyavarta

- Padmaka

- Swastika

- Prastara

- Karmuka

- Chaturmukha

ANCIENT TOWN CLASSIFICATION

Dandaka

- STREETS ARE STRAIGHT AND CROSS EACH OTHER AT RIGHT ANGLES AT THE CENTRE
- VILLAGE HAS 4 GATES ON FOUR SIDES
- VILLAGE IS RECTANGULAR / SQUARE
- WIDTH OF THE STREET VARIES FROM ONE - FIVE DANDA
- 2 TRANSVERSE STREET AT THE EXTREMITIES HAVE SINGLE ROW OF HOUSES
- THE VILLAGE OFFICES LOCATED IN THE EAST.
- THE FEMALE DEITY/ CHAMADEVATA - LOCATED OUTSIDE THE VILLAGE AND THE MALE DEITIES IN THE NORTHERN PORTION

DANDAKA
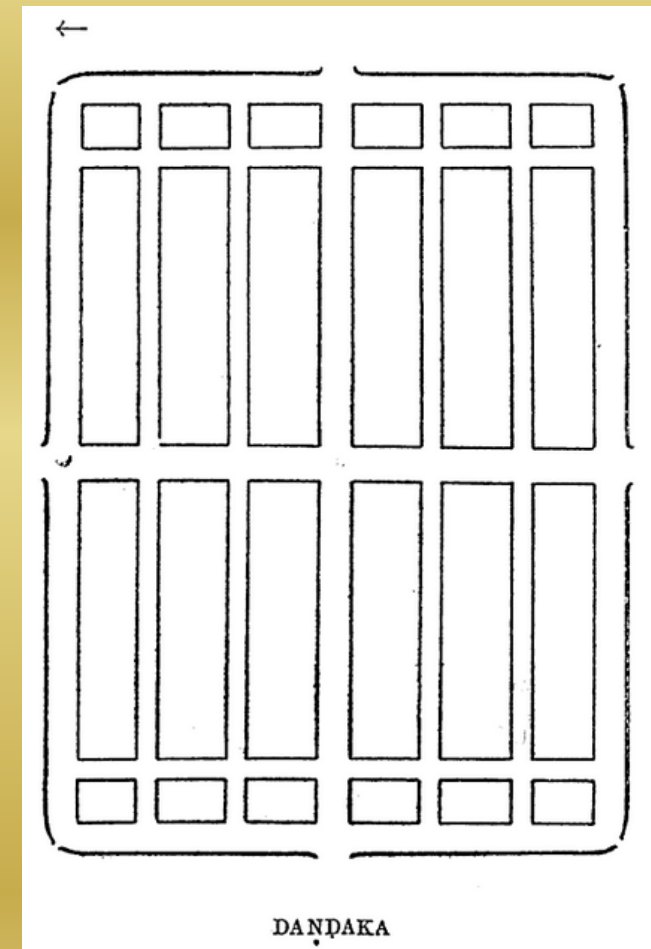
SARVATOBHADRA

- This type of town plan is applicable to larger villages and towns, which have to be constructed on a square sites.

- According to this plan, the whole town should be fully occupied by houses of various descriptions and inhabited by all classes of people.

- The temple dominates the village

SARVATOBHADRA
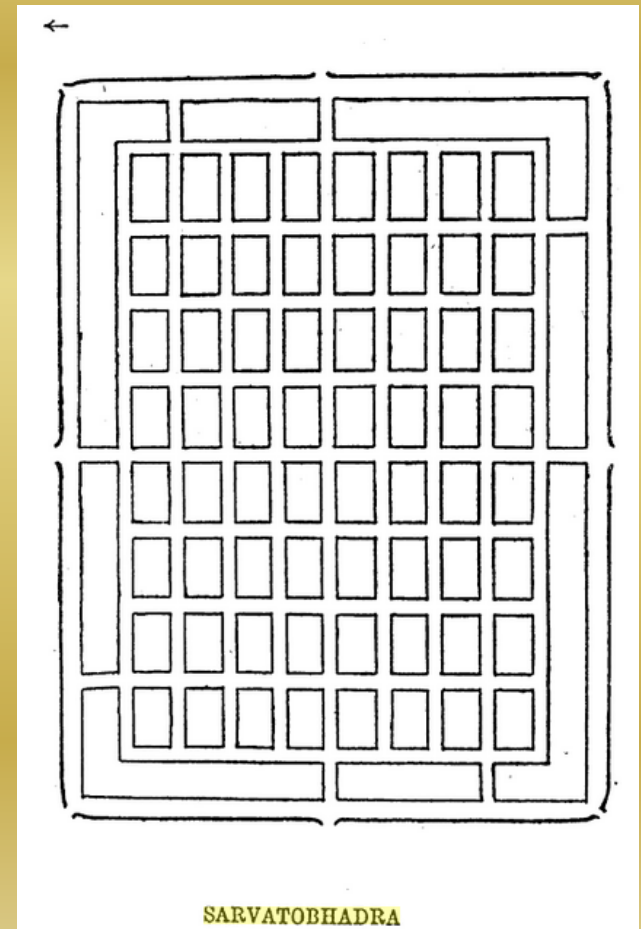
NANDYAVARTA

- This plan is commonly used for the construction of towns and not for villages.
- It is generally adopted for the sites either circular or square in shape, 3000 – 4000 HOUSES
- The streets run parallel to the central adjoining streets with the temple of the presiding deity in the center of the town.
- "Nandyavarta" is the name of a flower, the form of which is followed in this layout.

NANDYĀVARTA
(in Sthaṇḍila)
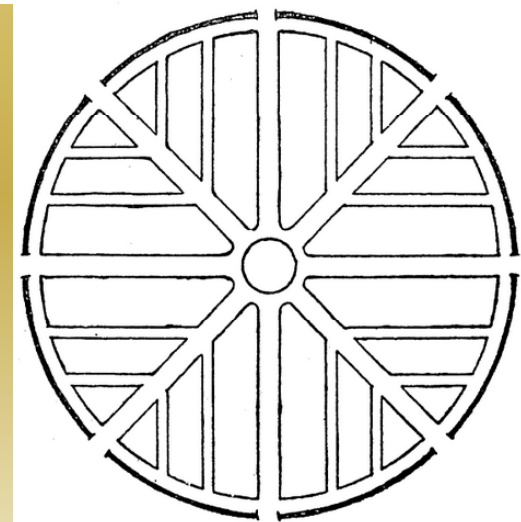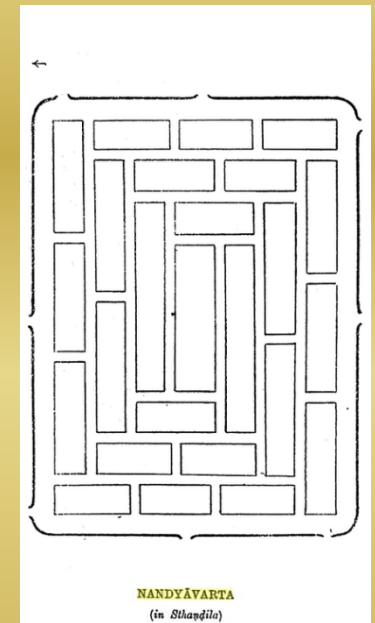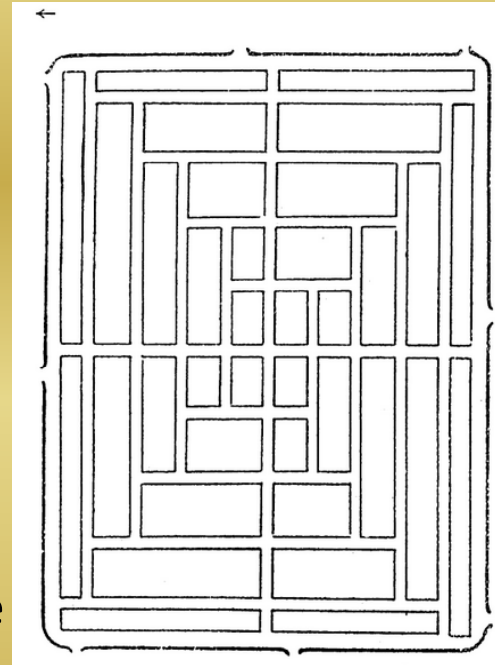
PADMAKA

- This type of plan was practiced for building of the towns with fortress all round.
- The pattern of the plan resembles the petals of lotus radiating outwards from the center.
- The city used to be practically an island surrounded by water, having no scope for expansion

PADMAKA
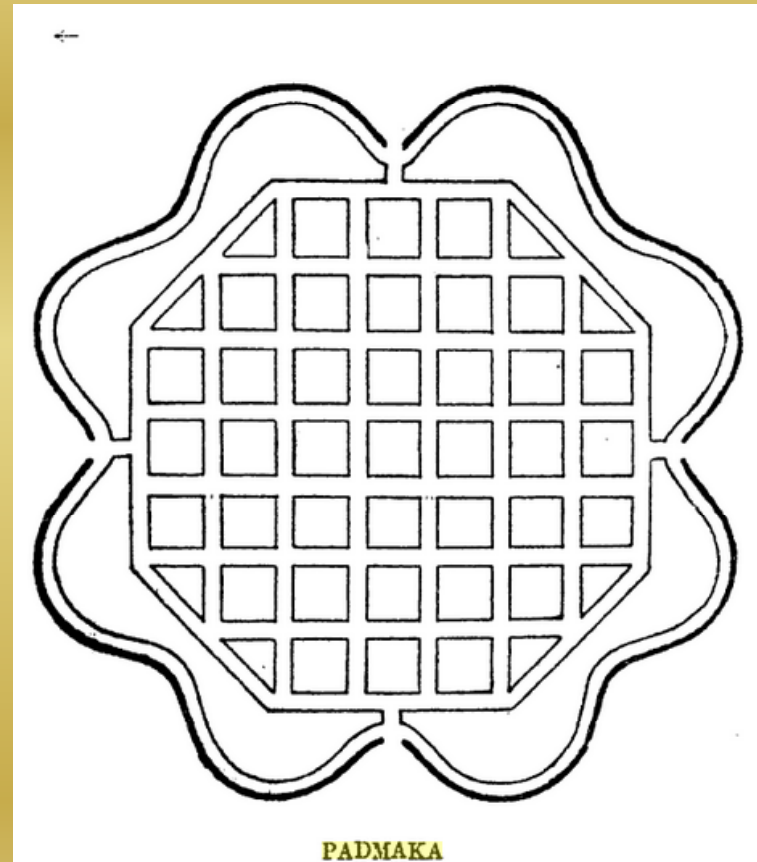
SWASTIKA

- Swastika type of plan contemplates some diagonal streets dividing the site into certain rectangular plots.

- The site need not be marked out into a square or rectangle and it may be of any shape.

- A rampart wall surrounds the town, with a moat at its foot filled with water.

- Two main streets cross each other at the center, running south to north and west to east.

SWASTIKA
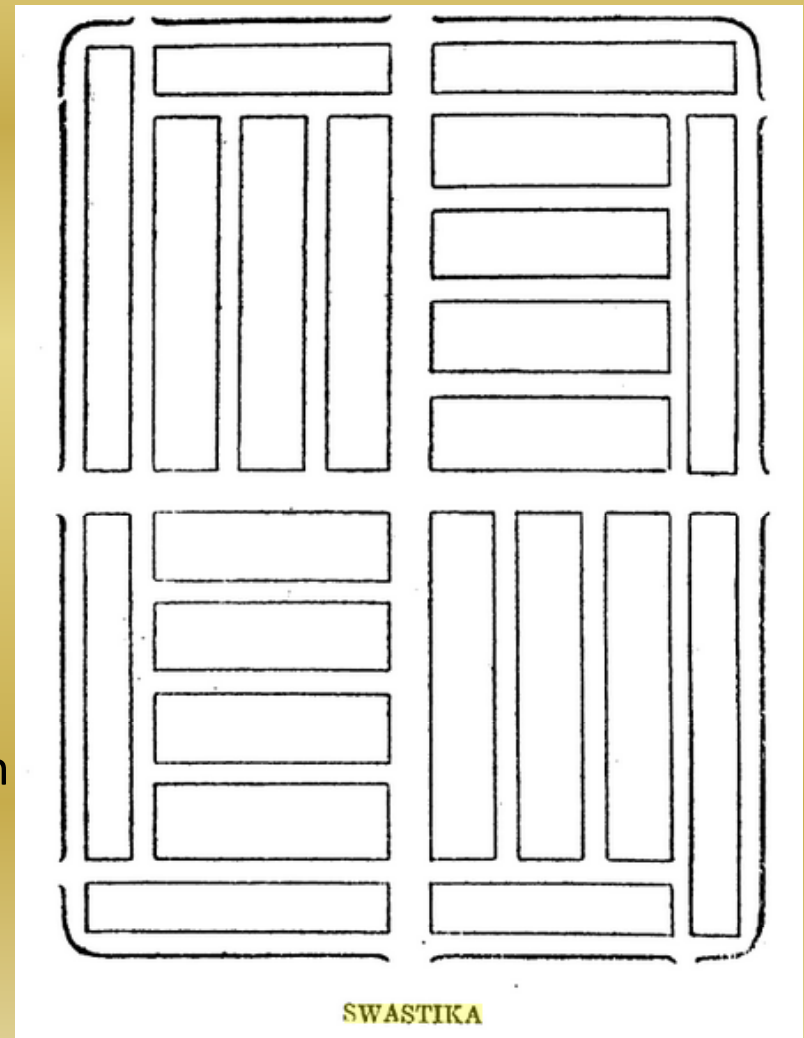
PRASTARA

- The characteristic feature of this plan is that the site may be either square or rectangular but not triangular or circular.

- The sites are set apart for the poor, the middle class, the rich and the very rich, the sizes of the sites increasing according to the capacity of each to purchase or build upon.

- The main roads are much wider compared to those of other patterns.

- The town may or may not be surrounded by a fort.
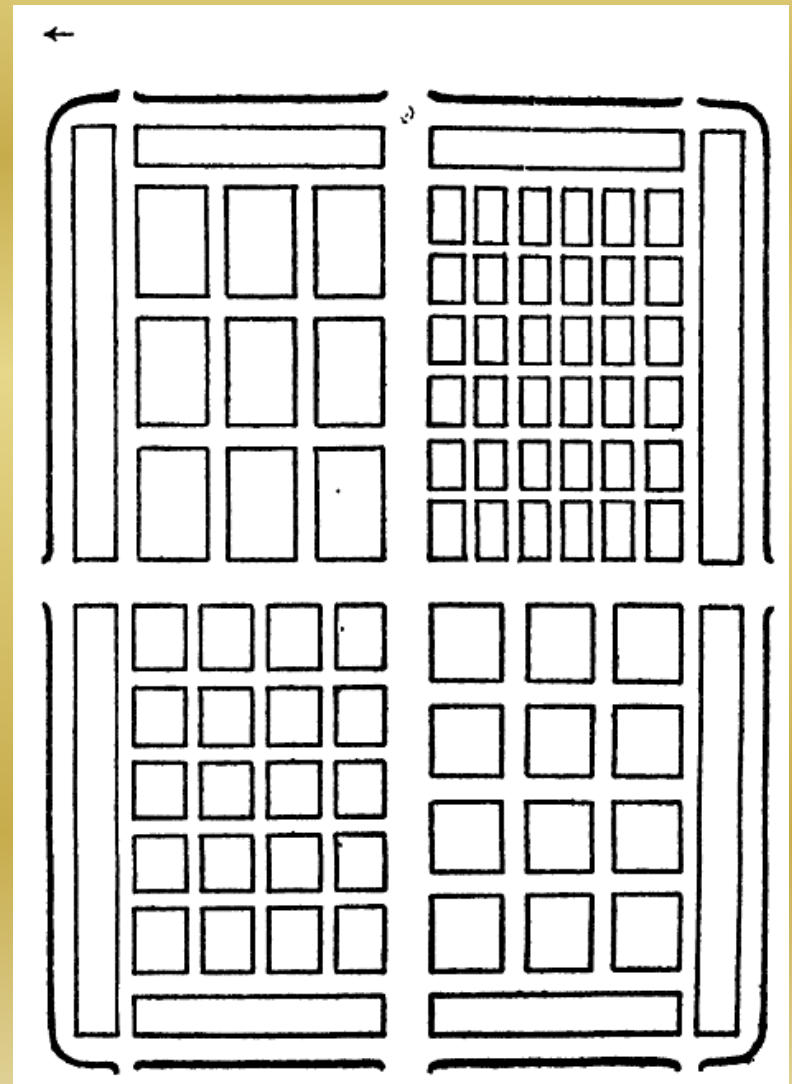
KARMUKA

- This plan is suitable for the place where the site of the town is in the form of a bow or semi-circular or parabolic and mostly applied for towns located on the seashore or riverbanks.

- The main streets of the town run from north to south or east to west and the cross streets run at right-angles to them, dividing the whole area into blocks.

- The presiding deity, commonly a female deity, is installed in the temple build in any convenient place.
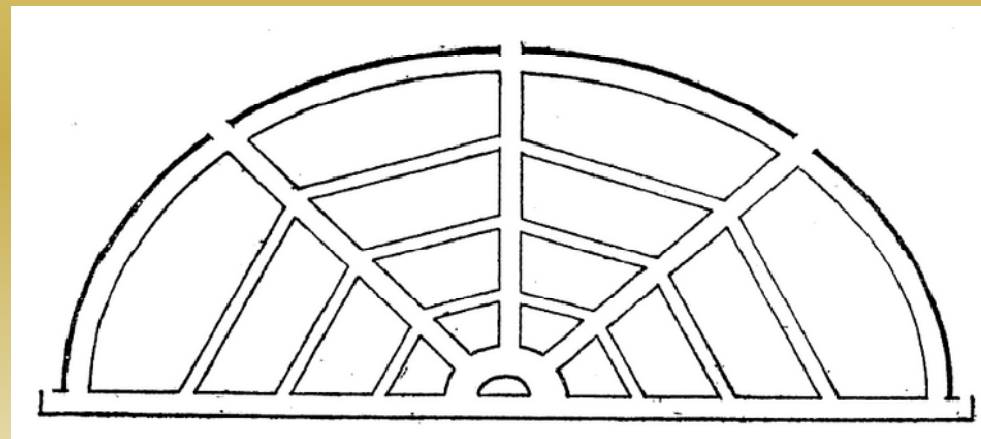
CHATURMUKHA

- Chaturmukha type of plan is applicable to all towns starting from the largest town to the smallest village.

- The site may be either square or rectangular having four faces.

- The town is laid out east to west lengthwise, with four main streets.

- The temple of the presiding deity will be always at the center
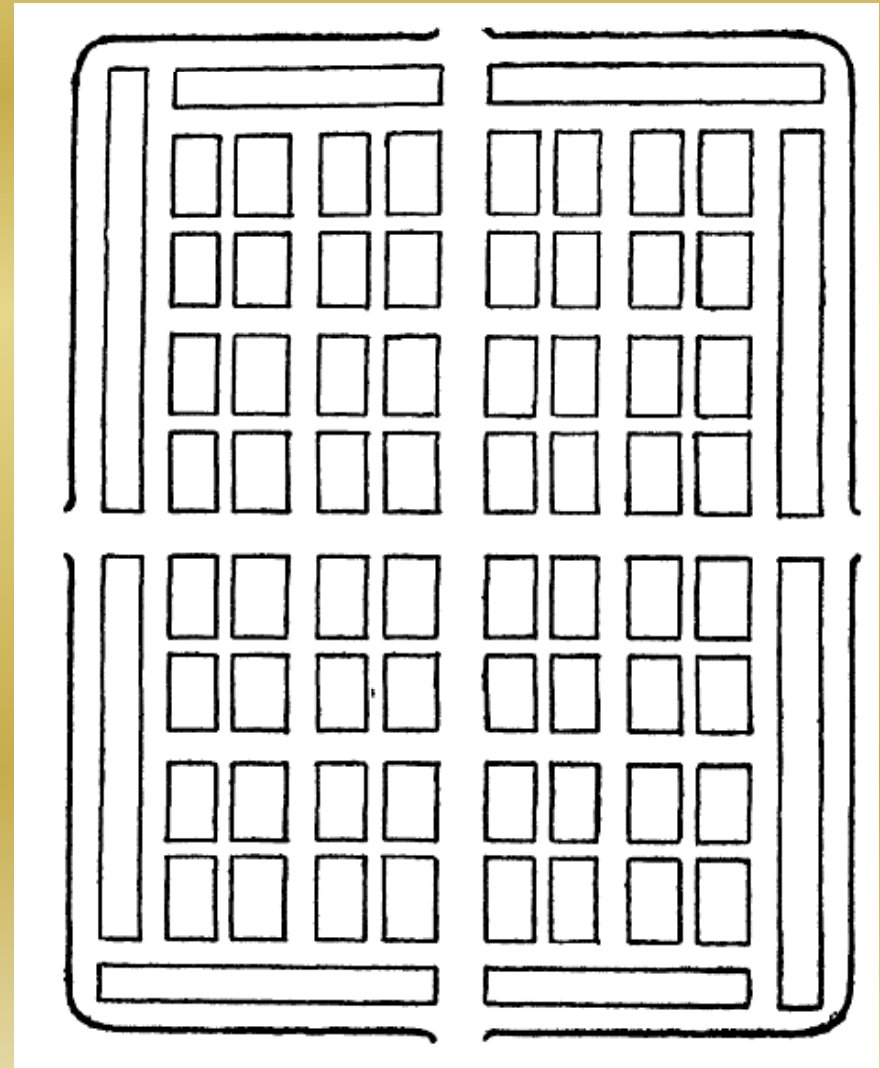
FATEHPUR SIKRI
Introduction

- Founded by Akbar, this city has a long story, which says that Akbar built this city in the honour of the saint, Shaikh Salim Chishti. It is believed that, Akbar didn't had heir till the age of 26. Regarding this, he visited the saint, whose blessing gave Akbar 3 sons.

- Henceforth, the city of Red Sandstone buildings was established - the Fatehpur Sikri.

- Unlike Agra that wasd a thriving centre of trade, Sikri was a little village which had first come to Mughal notice when Babur, triumphant after defeating Rana Sanga at Khanuwa in 1527, according to a popular belief, named the village Shukri, meaning thanksgiving

- Fatehpur Sikri is said to be the look-alike of the mosque in Mecca and has designs, taken from the Persian & Hindu architecture.

- It was planned as the cultural, commercial and administrative centre of mughal empire.

- Fatehpur Sikri is built in red sandstone, and is a beautiful blend of Hindu and Islamic architectural elements.

- The sandstone is richly ornamented with carving and fretwork.

- Fatehpur Sikri was abandoned 14 years after its creation.

- Today it is a ghost city, its architecture is in a perfect state of preservation, and wandering through the palaces it is easy to imagine that this was once a royal residence and a dynamic cultural centre.

FATEHPUR SIKHRI

CITY BUILT ON FLAT TERRAIN ON ROCKY SANDSTONE RIDGE
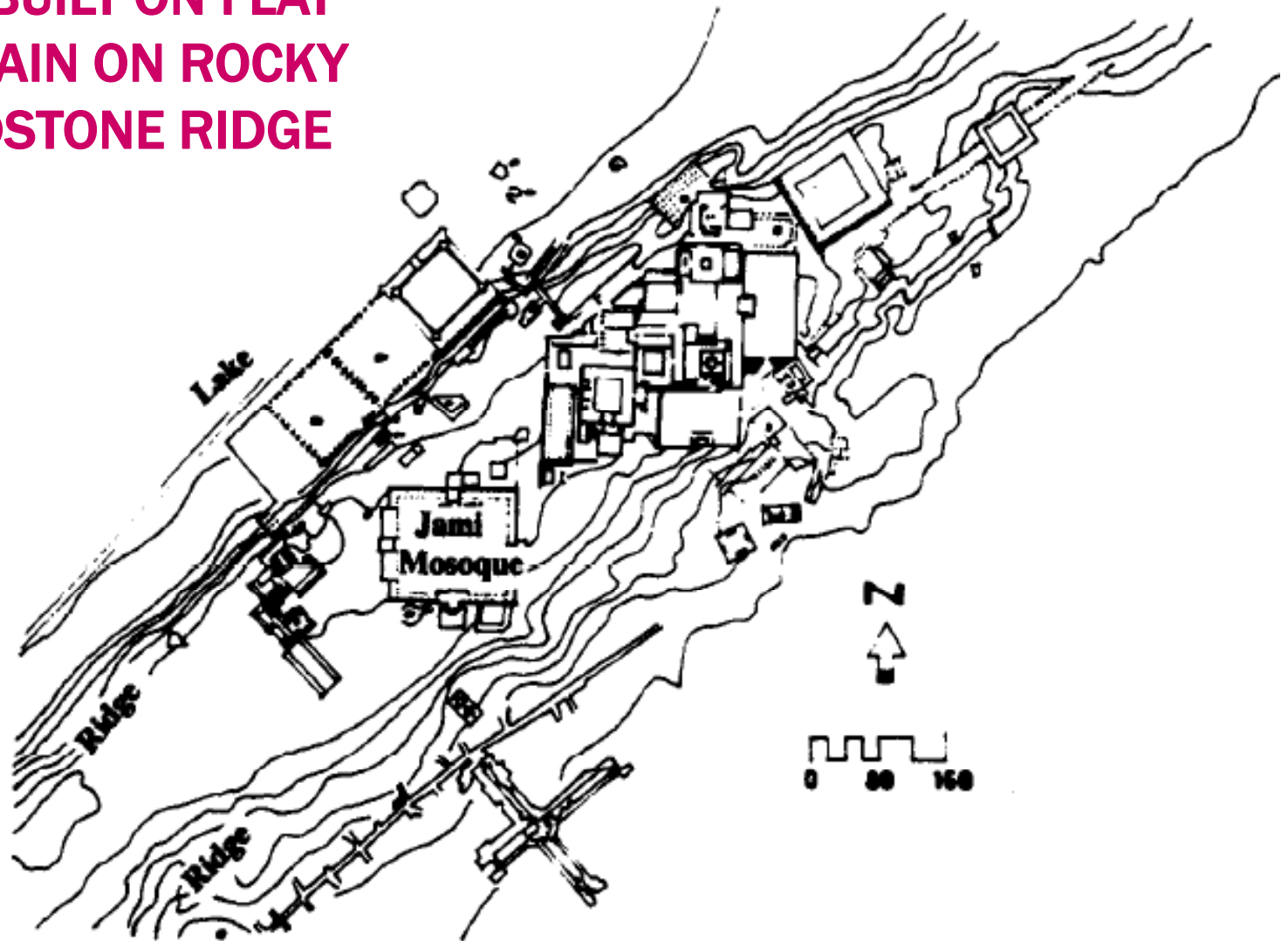
FATEHPUR SIKHRI

- **Naubat Khana (The Drum House) :** Near the entry point to the city. The road passes through this building. Probably this was the place that announced the arrival of the emperor.

CITY AND ITS WALLS
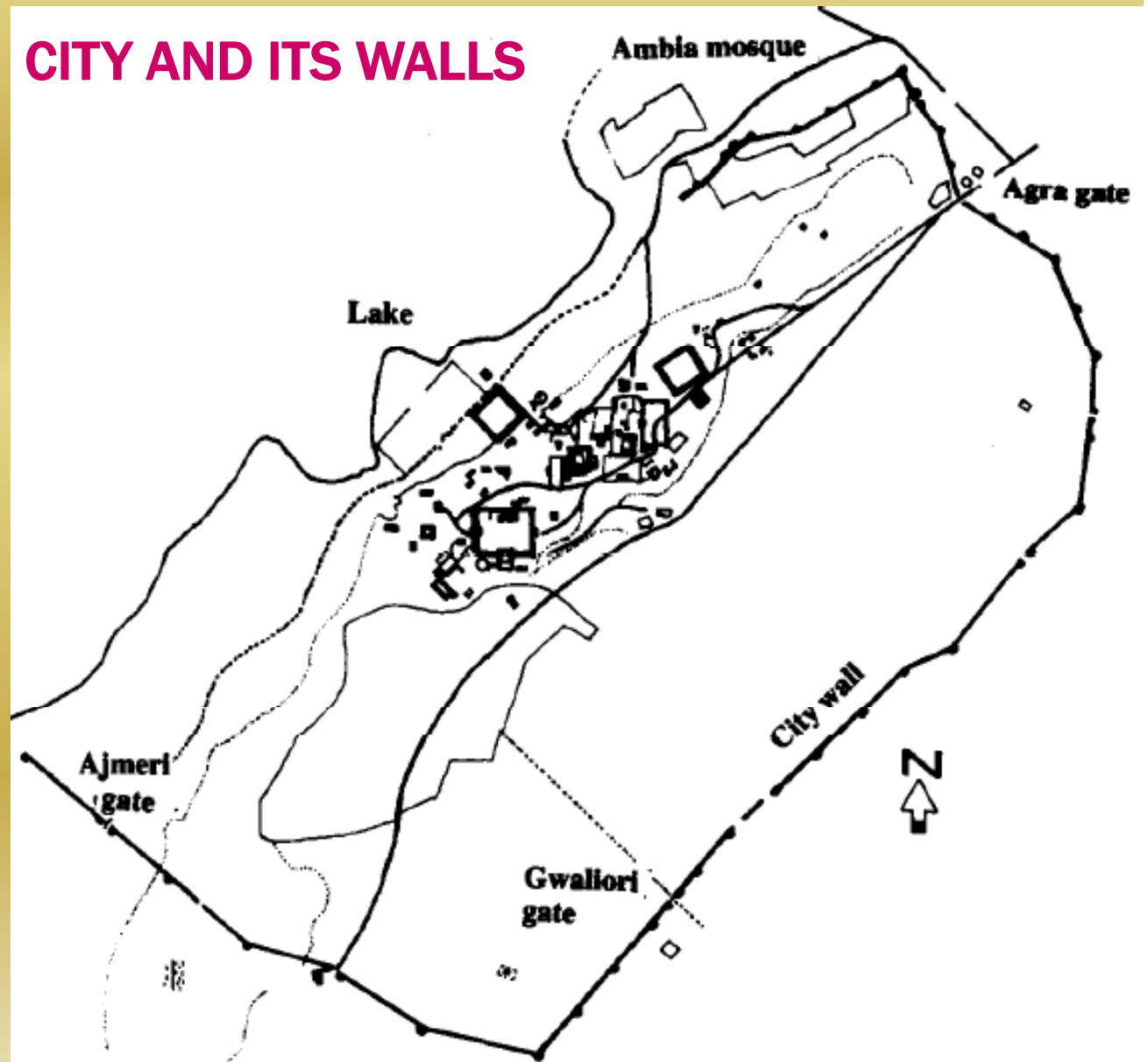
FATEHPUR SIKHRI

LAYOUT PLAN
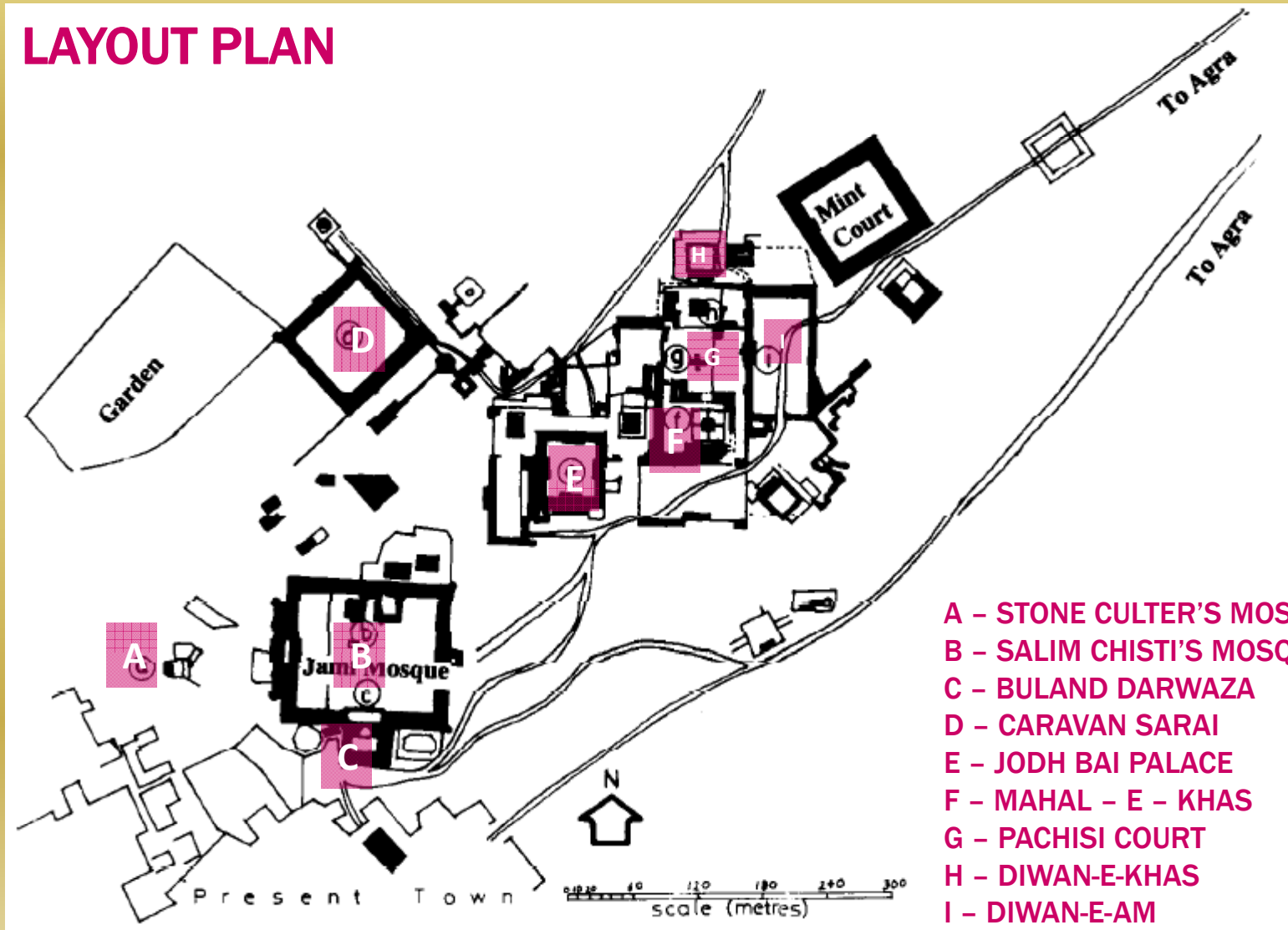
A – STONE CULTER'S MOSQUE
B – SALIM CHISTI'S MOSQUE
C – BULAND DARWAZA
D – CARAVAN SARAI
E – JODH BAI PALACE
F – MAHAL – E – KHAS
G – PACHISI COURT
H – DIWAN-E-KHAS
I – DIWAN-E-AM

IMPERIAL COMPLEX

- The imperial palace complex, consisting of the treasury, the offices, Daulat Khana, the Haram sara or ladies palace, now appears irregular and disjointed; but in Akbar's time is was part of a well connected and highly planned complex.

FATEHPUR SIKHRI
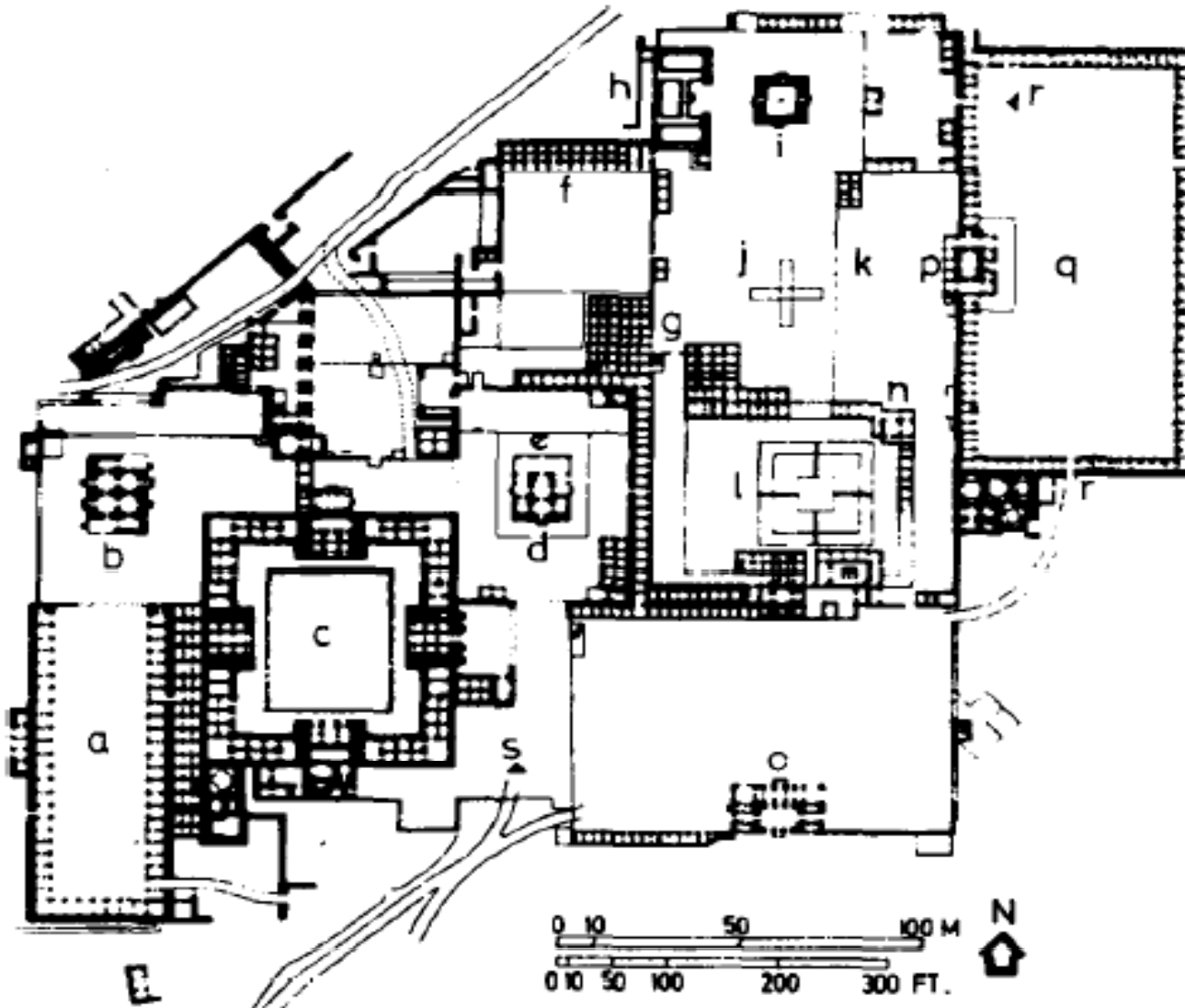
A - STABLES FOR CAMELS & HORSES
B - RAJA BIRBAL'S HOUSE
C - JODH BAI'S HOUSE
D - MARYAM'S GARDEN
E - MARYAM'S HOUSE
F - HOSPITAL AND GARDEN
G - PANCH MAHAL
H - EMPEROR'S STUDY
I - DIWAN-E-KHAS
J - PACHISI COURT
K - GARDEN
L - EMPEROR'S PRIVATE APTS
M - EMPEROR'S SLEEPING QTZ
N - HOUSE OF THE TURKISH SULTANA
O - ADMINISTRATION AND ARCHIVES
P - DIWAN-E-AM PAVILION
Q - DIWAN-E-AM
R - ENTRANCES FOR PUBLIC
S - RESERVED ENTRANCE FOR IMPERIAL
    FAMILY

Diwan-i-Am

- **Diwan-i-Am (Hall of Public Audience) :** The place where the ruler meets the general public. Diwan-i-Am is a typical feature of all the Mughal palaces. At one end of the court is an elevated pavilion. The pierced stone screens are most noteworthy. Now the open court is converted into a garden with lawn, where once stood the courtiers in humility.

Daulat Khana

- Comprises the pillared structure known as Diwan-i-Khass, Khana-i-Khass, the Khwabgah, the Anup Talao, the Turkish Sultana's pavilion and other minor structures

Diwan-i-Khass (Jewel House)
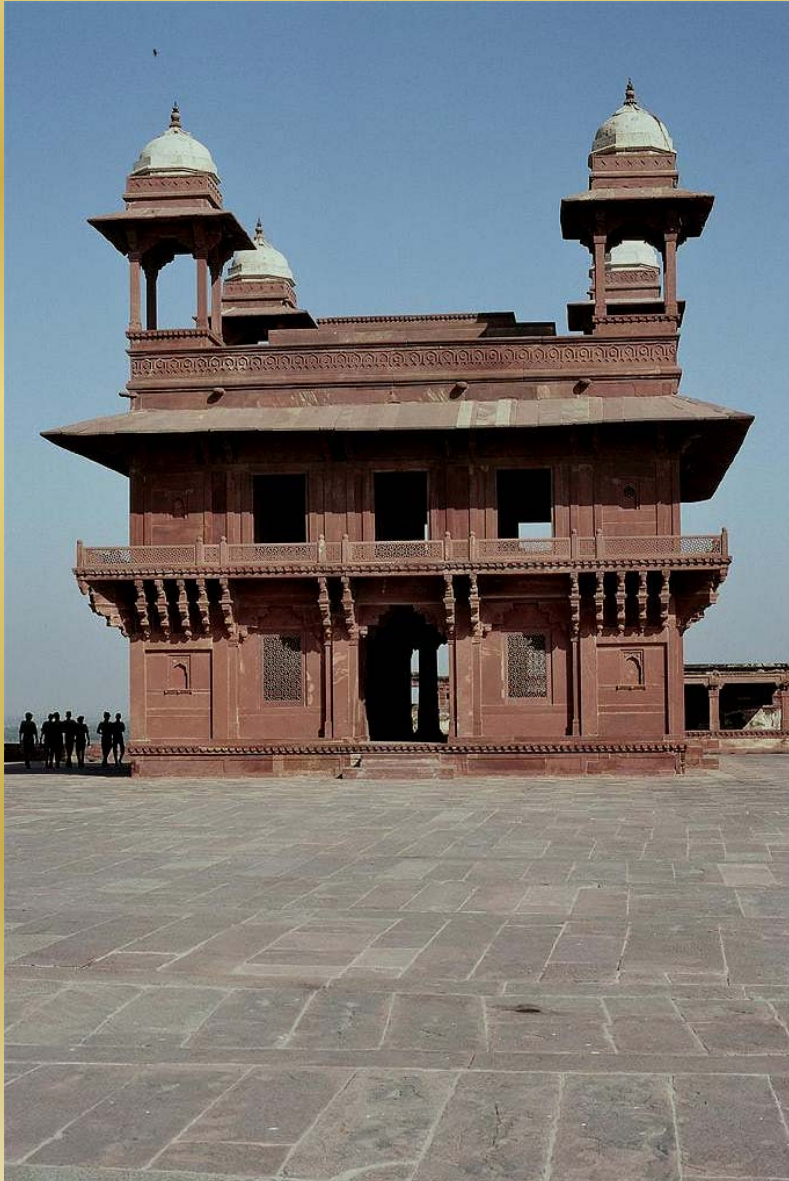
- Diwan-i-Khas
  (Hall of Private Audience) : This is where Akbar met his ministers, scholars and generals to discuss religious and courtly matters.

Pillar detail from Diwan-i-Khas interior

- A problem faced while identifying many monuments in Fathehpur is that they were constructed in such a way that a variety of uses could be assigned to them.

Ankh Michauli

- people often attribute this building the game of hide and seek. And even extended that to the level that Akbar played the hide and seek game with the women of the harem! Most likely this is the vault house of the palace where valuables were kept in the safe custody.

Ankh Michauli

Astrologers seat

- Luxuriously extravagant stone brackets placed on each of the kiosks four openings. The emperor would sit here and watch the distribution of the copper coins which contemporary european travellers say usually heaped in the courtyard to pay subordinate officers
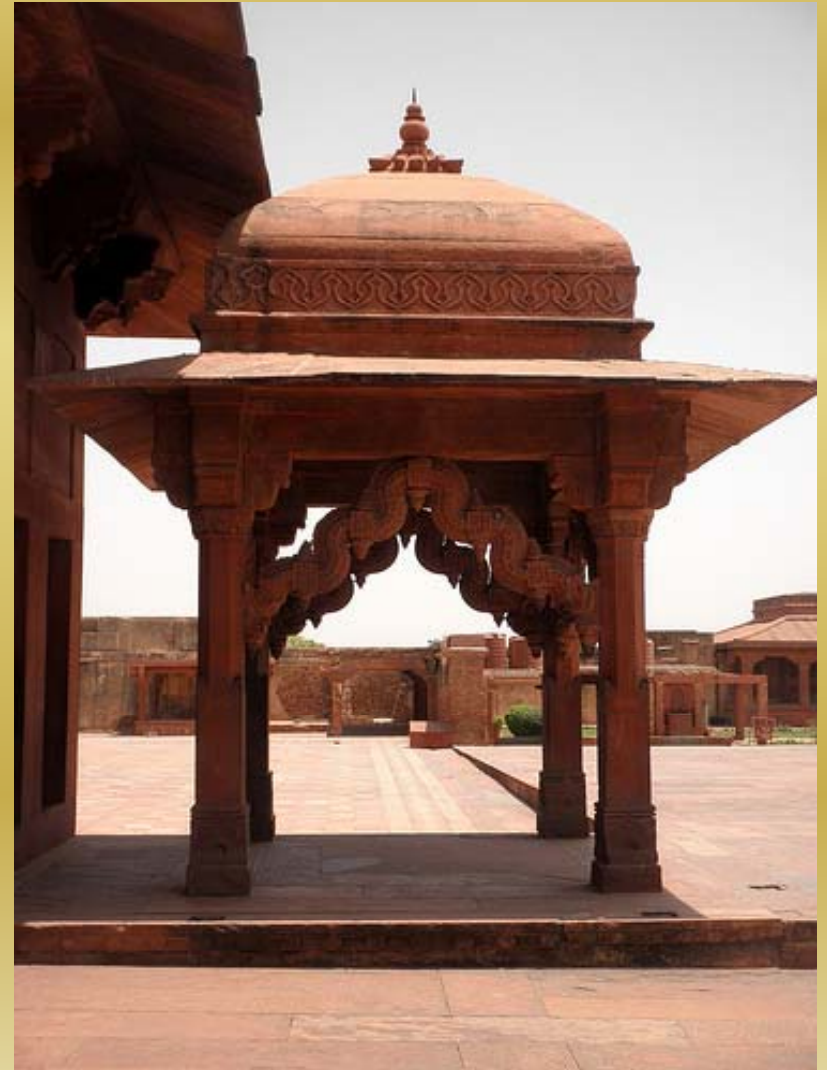
Diwan Khana-i-Khass

- Diwan Khana-i-Khass : Akbar is believed to have sat, discussing various issues with close advisors.

Khwabgah

- On the first floor of the Diwan Khana-i-Khasswas the emperor's private room, known as khwabgah or sleeping chamber. After sitting in Diwan Khana-i-Khass for several hours Akbar probably used to retire here for relaxation.

Anup Talao

- Anup Talao or the peerless pool 29m square tank, now dry most of the year. Anup Talao has a central island linked by four bridges to its sides.

Turkish Sultana's House

- **The Turkish Sultana's House :** The most elaborately carved building in Fatehpur Sikri. It's often attributed to the Turkish wife of Akbar.
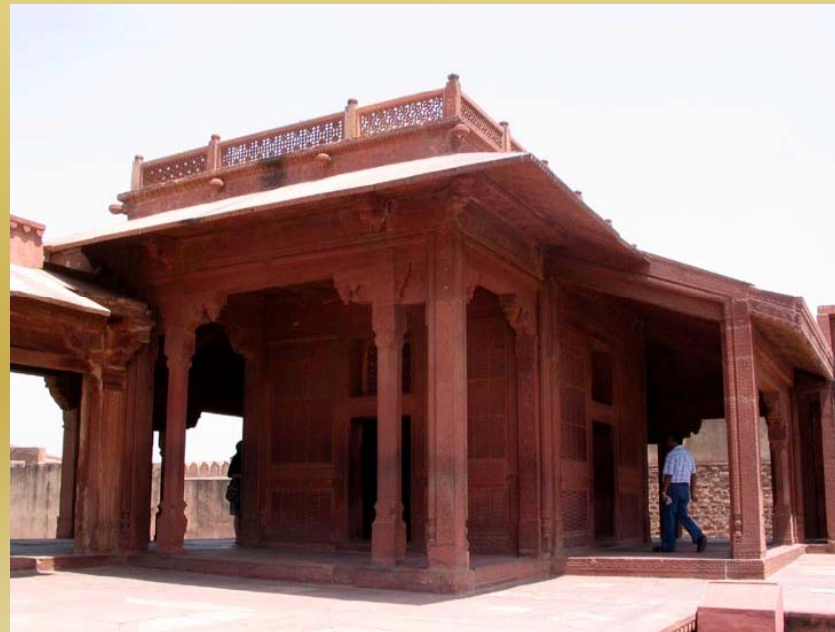
- It is more probably the 'Hujra-I-Anup Talao', mentioned by Badauni, a pleasure pavilion attached to the pond and might have been used by the Turkish queens for this purpose.

- Intricately carved like wood, this building is also known as 'superb jewel casket'and each of its stone slab has a different design such as arabesque designs on the pillars of verandah and bell shaped, floral and herring-bone carvings on the brackets supporting the roof.
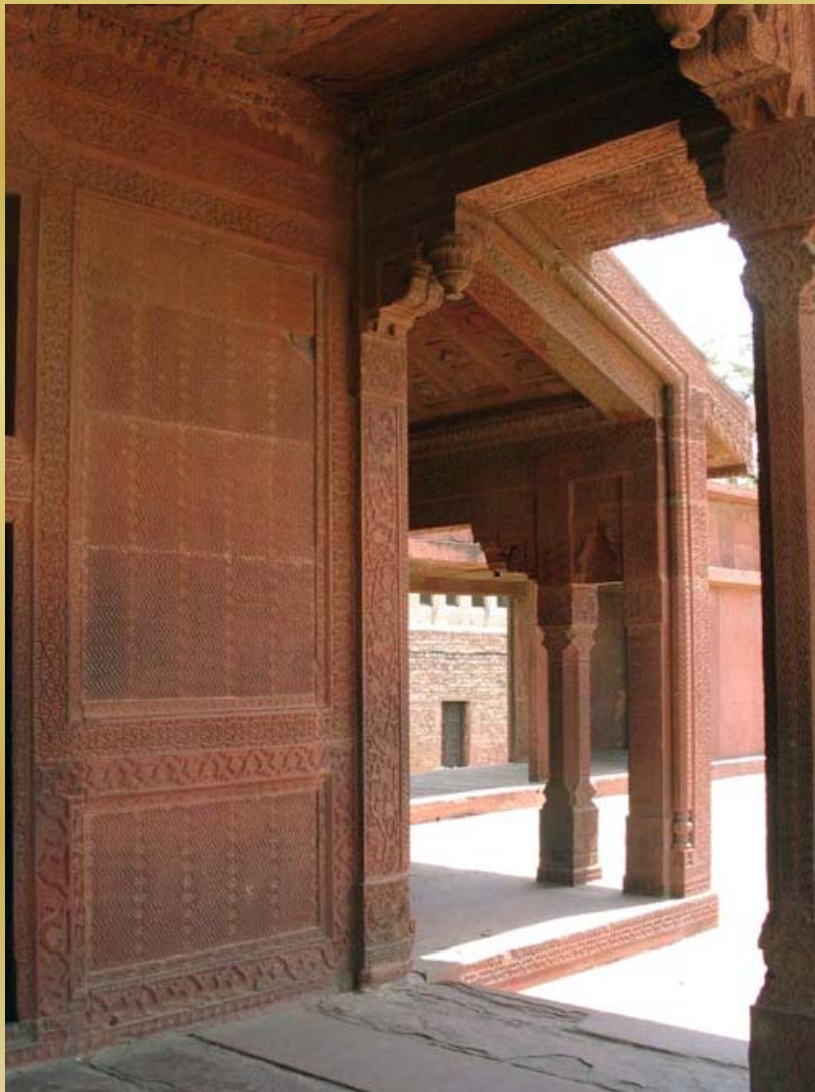
Pachisi Court

- **Pachisi Court :** This is located at the very center of the main palace complex. On the open floor are the markings of a board game called Pachisi , hence the name.

- An enclosure where women of the royal household lived in protected environs. It included the panch mahal, Jodh Bai's palace, Maryam's house and birbal's house. Each was connected with other by covered passages, and screened off to the east from the Daulat khana

Panch Mahal

- Panch Mahal is an extraordinary structure, entirely columnar, consisting of four storeys of decreasing size with a kiosk, disposed asymmetrically upon a ground floor that contains 84 columns. The first storey contains 56 columns; the second 20; the third 12; and the top storey is a single domed kiosk supported on four pillars.

Panch Mahal, Fatehpur Sikri
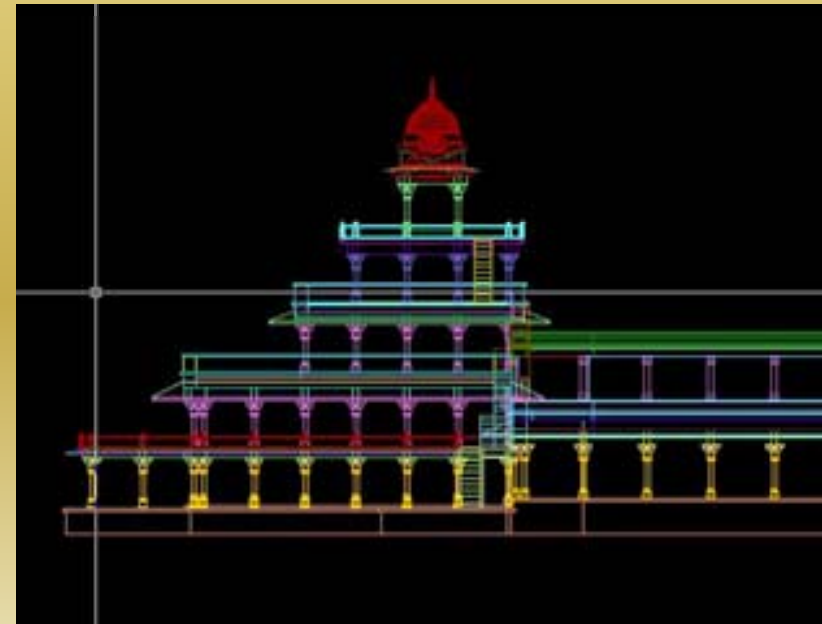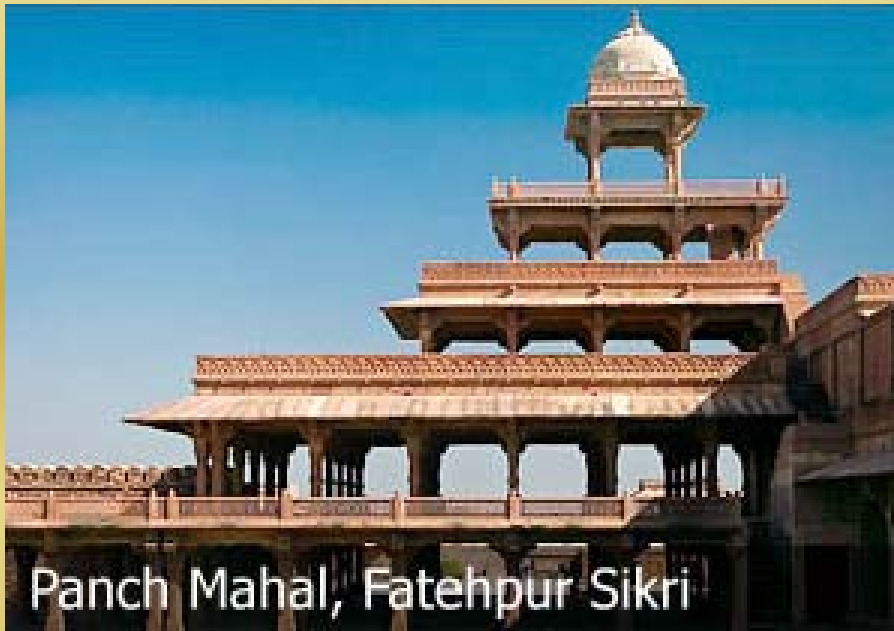
- Panch mahal is modelled on the persian badgir or wind-catcher and meant to mitigate the intense summer heat. Yet it was unlike the persian original that it was not tower but built in diminishing stages. Also it had five storeys, not the usual three and was screened on all but the ground floor

Jodh Baí's Palace and Maryams house

- **Jodh Baí's Palace :** This is a large harem were the women of the palace lived.
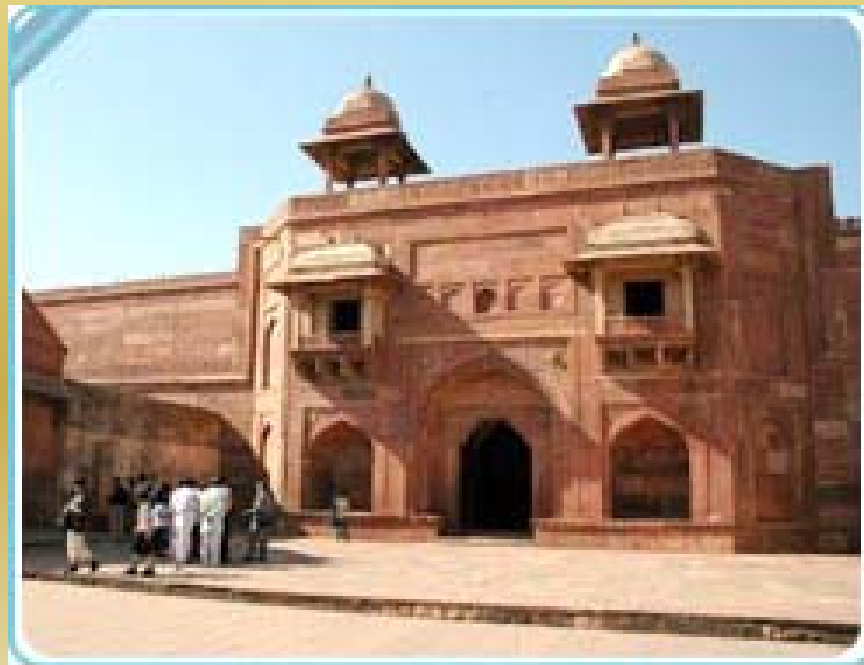
- **Maryam's house:** Two maryams in Akbar's court. Maryam Makani (equal in rank to mary) was Akbar's mother Hamida Banu Begum and Maryam Zamani (mary of the age) was his first Rajput queen. It is believed that this building within a large court was used by Akbar's mother and queen. It's built in Hindu style with many themes taken from the Hindu mythology painted on the walls.

Nagina Masjid

- **Nagina Masjid** : The private mosque for the ladies of the Harem.

Birbal's house

- Birbal's House: Though it is named so, chances are unlikely that this was used by this famous minister of Akbar. This is one of the most beautiful buildings within the palace complex.

Lower Haram Sara

- At the rear of the principal Haram sara, is a large colonnaded enclosure. It has been variously called the imperial stables for camels, elephants or the emperor's choicest horses.

- The place must have been allotted to the serving maids of the ladies palaces. The sanitary needs of the staff were met with a hammam at the eastern end of the block.
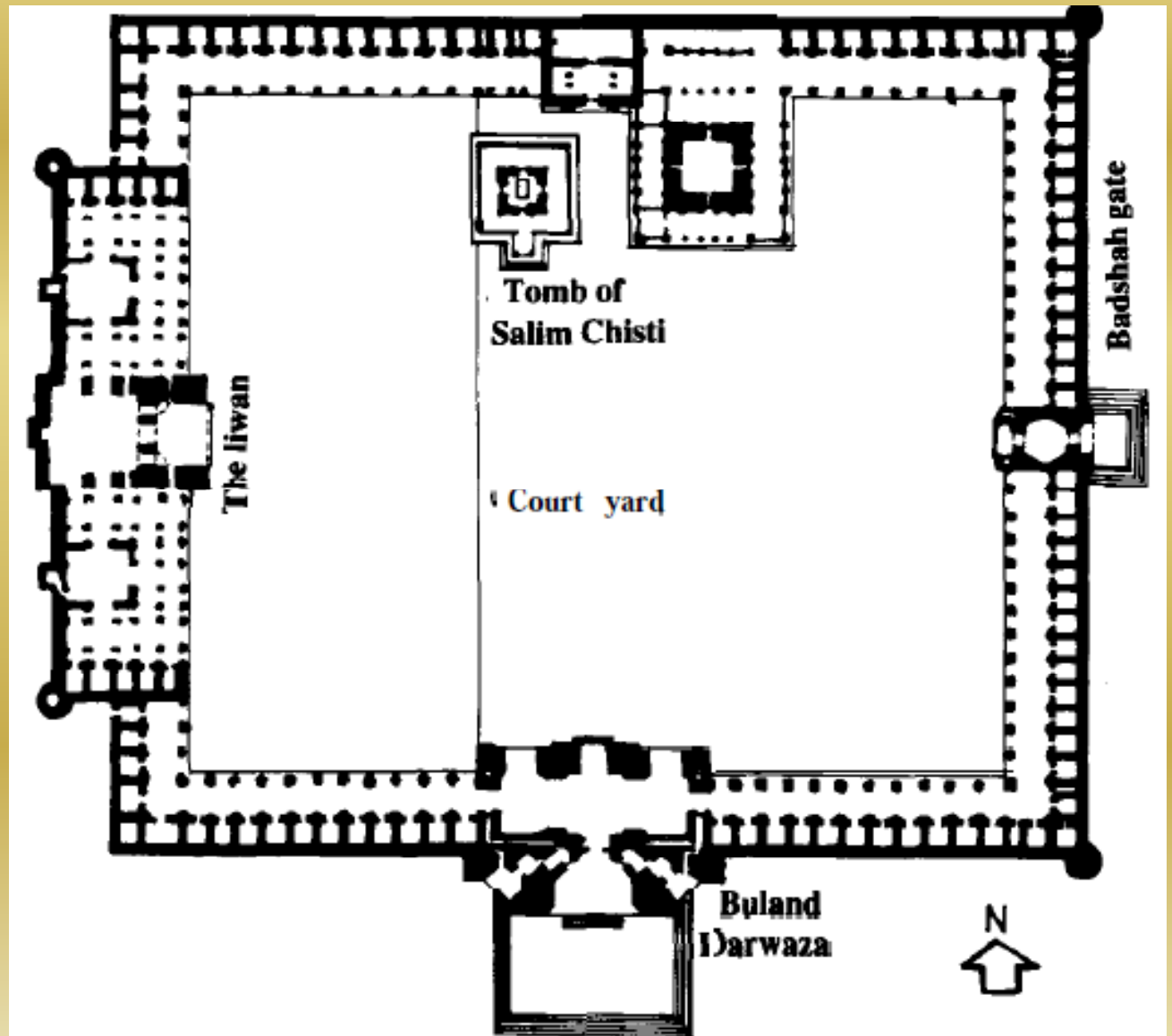
FATEHPUR SIKHRI

1. MEETING PLACE WITH THE COMMON PEOPLE AND THE SOLDIERS – DIWAN–E–AM
2. MEETING PLACE WITH THE MINISTERS, PRIVELEGED NOBLEMEN & HIGH OFFICIALS – DIWAN-E-KHAS
3. KING'S DAY PALACE AND SLEEPING QUARTERS – KHWABAGH
4. ENCLOSURE FOR IMPERIAL LADIES [PRIVATE AND STRICTLY GUARDED] – MARYAM & JODH BAI PALACE

Monuments

- Situated on the spot where Sheikh Salim Chisti lived, the sacred complex is situated at the highest point of the ridge.

- Jami Masjid or the main congregational mosque of the town is the most important building here and houses two monumental gateways known as Buland Darwaja commemorating Akbar's victory over Deccan and Badshahi Darwaja, the reserved entrance for the emperor to the mosque.

- It also houses a big and beautiful courtyard with the splendid architectural masterpiece known as the Tomb of Salim Chishti, which is one of the most sought-after buildings in Fatehpur Sikri.

FATEHPUR SIKHRI

Jami Masjid Fatehpur Sikri

- Jami Masjid or the Friday Mosque is one of the most beautiful and largest mosques of the world. This elegant building is the most sacred building and the principal mosque of the town and thus situated on the highest point of the ridge
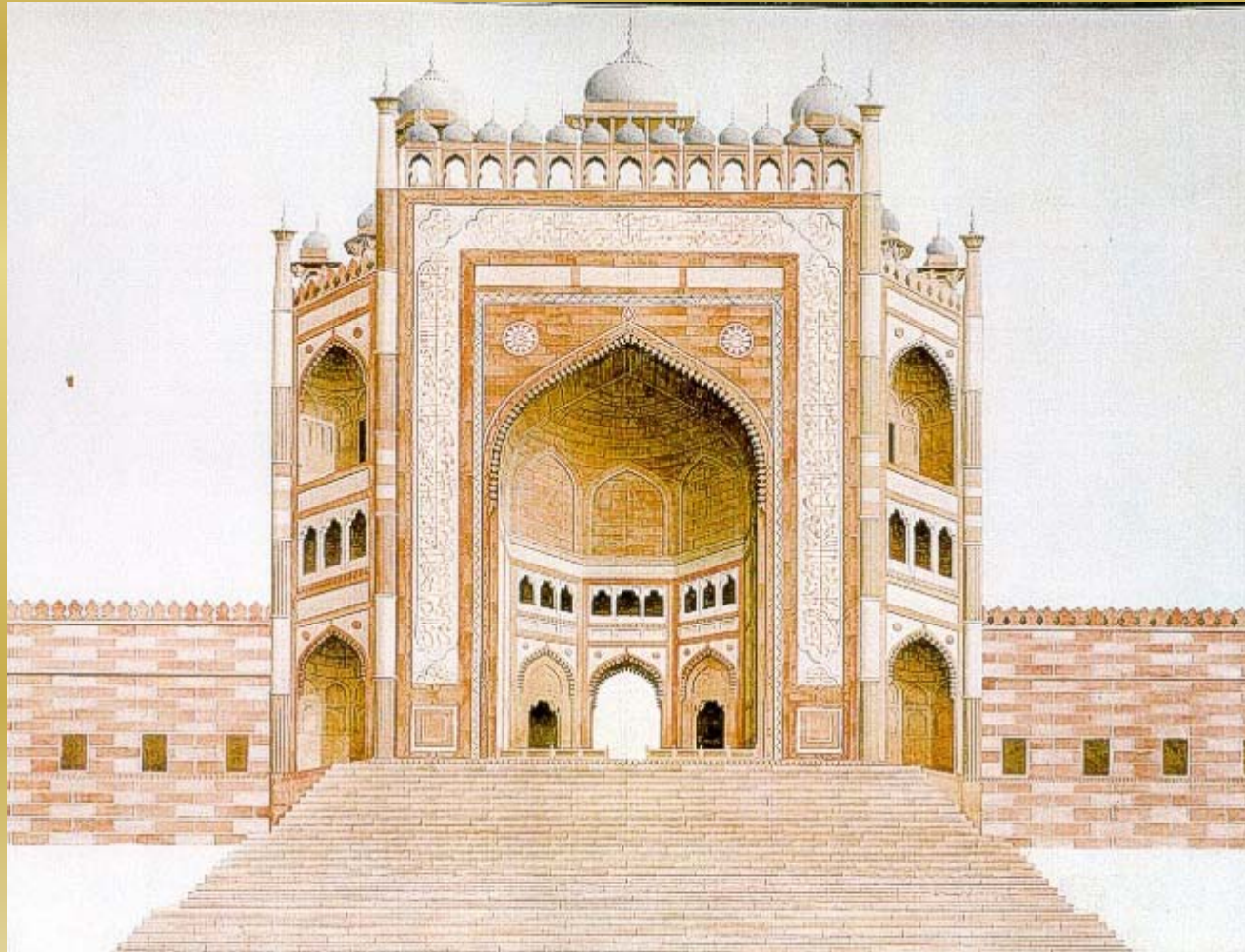
Badshahi Darwaja

- Badshahi Darwaza or the Royal Door was reserved for emperor to join the congregational prayer. It was situated on the eastern side of the mosque facing Agra and was the main entrance to the mosque. Projecting out in the form of a half hexagonal porch
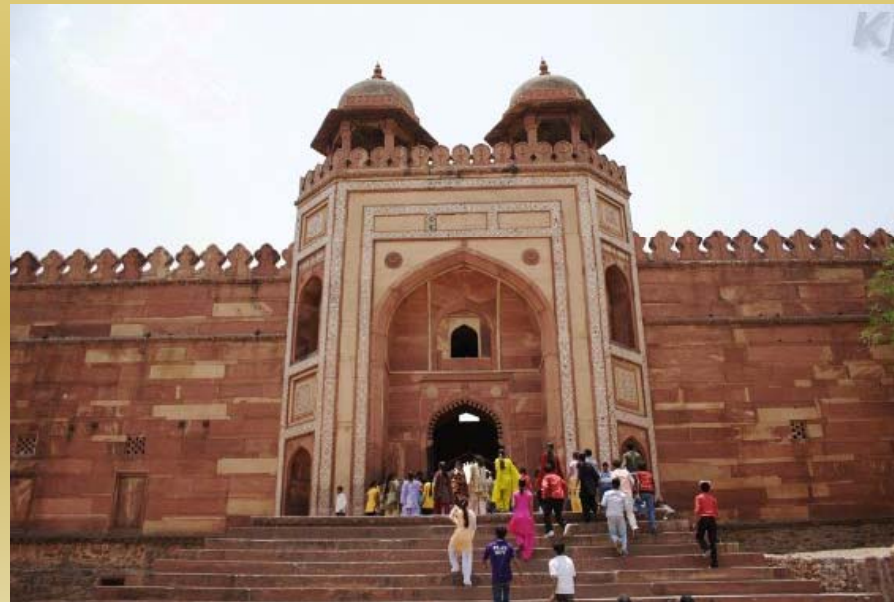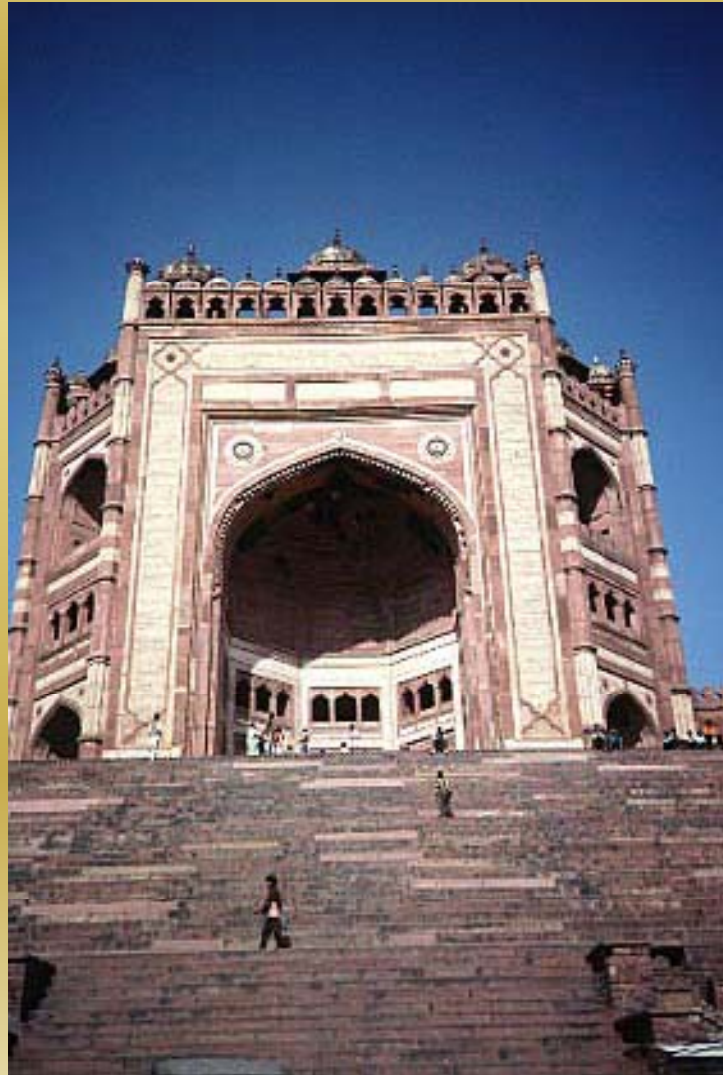
Buland Darwaja

- Buland Darwaza is the highest and grandest gateway in India and ranks among the biggest in the world. It can be approached by a 13-metre flight of steps from outside, which adds to its splendour. The gate was raised in 1602 AD to commemorate Akbar's victory over Deccan.

Buland gate, entrance to Masjid

- The mausoleum was built by Akbar as a mark of his respect and reverence for the saint and it was completed in the year 1580-81.
- Raised on about a meter high platform, there is flight of five steps to reach its entrance porch.
- Elegant marble screens enclose the main tomb building on all sides while the tomb is places in the centre of the main hall with a single semicircular dome.
- The serpentine brackets emerging from the pillars carved with stylized peacock tail pattern and sloping eaves add to the magnificence of the porch. The door of the main chamber is carved elaborately with arabesque patterns and boasts of Quranic inscriptions.
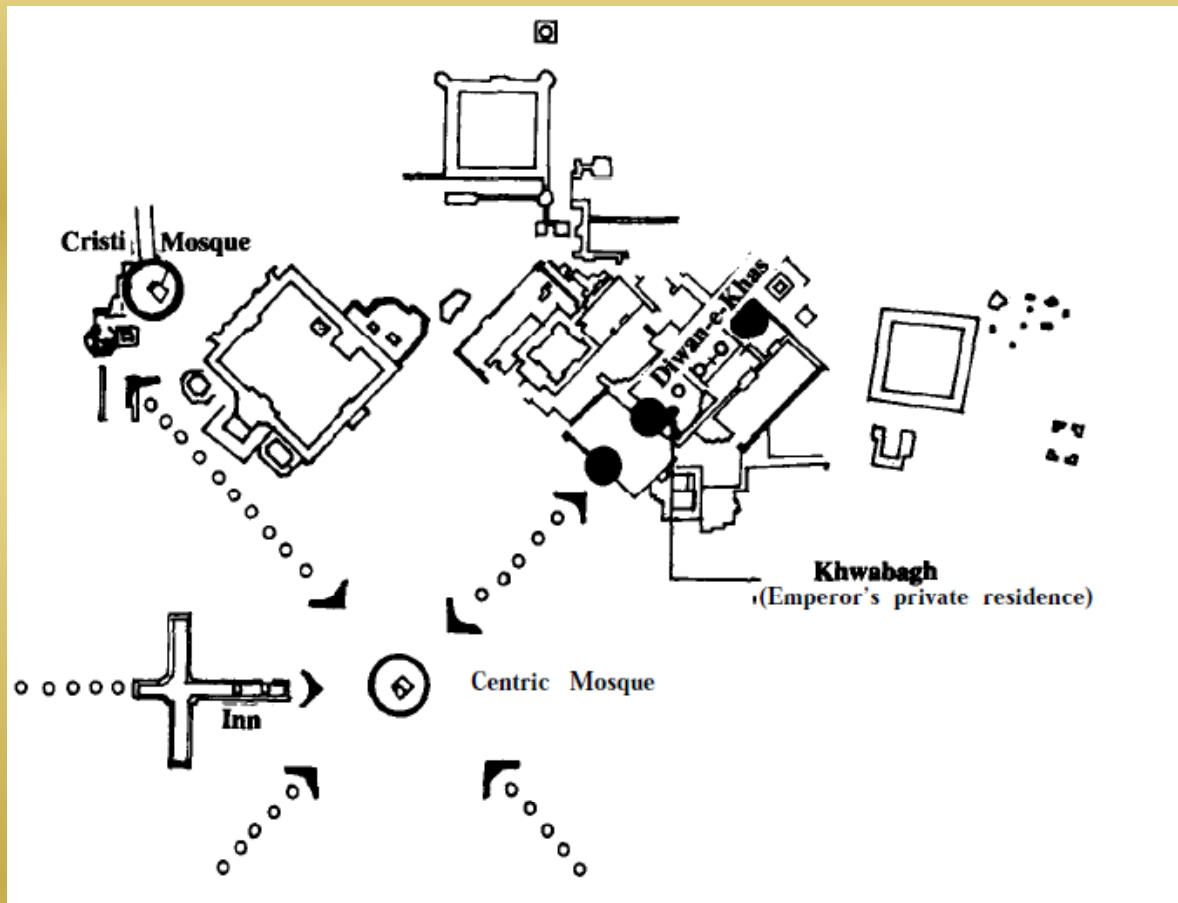
Fatehpur Sikri: Salim Chisti's Tomb

FATEHPUR SIKHRI

Actual E-W axis
Axis of the mosque
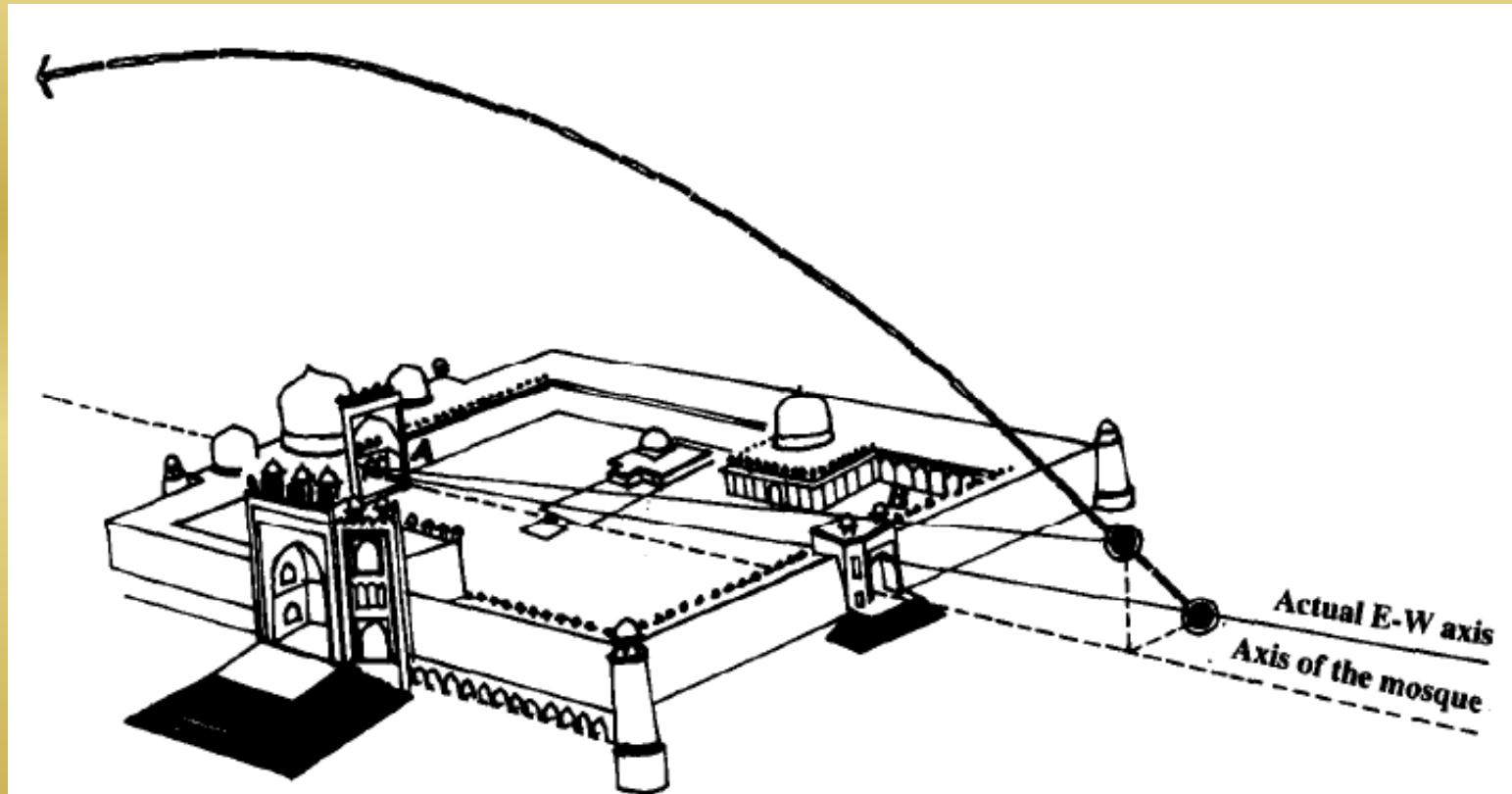
ACTUAL EAST WEST ORIENTATION IS A FEW DEGREES NORTH TO THE AXIS OF THE MOSQUE.AS A RESULT OF THIS AT SUNRISE AND DURING SPECIFIC PERIOD OF THE YEAR, THE SUN MOVES INTO A PARTICULAR POSITION OVER THE AXIS OF THE MOSQUE. IT REACHES THE REQUIRED ALTITUDE AND STRIKES THE CENTRAL MIHRAB

19; The centric **mosque also** provided **a** visual **focus** and guided the **location of** several **important** buildings. For example, **Diwan-e-Khas** and **Khwabagh** (Emperor's private **residence**) and centric mosque are **all** in **one** axis
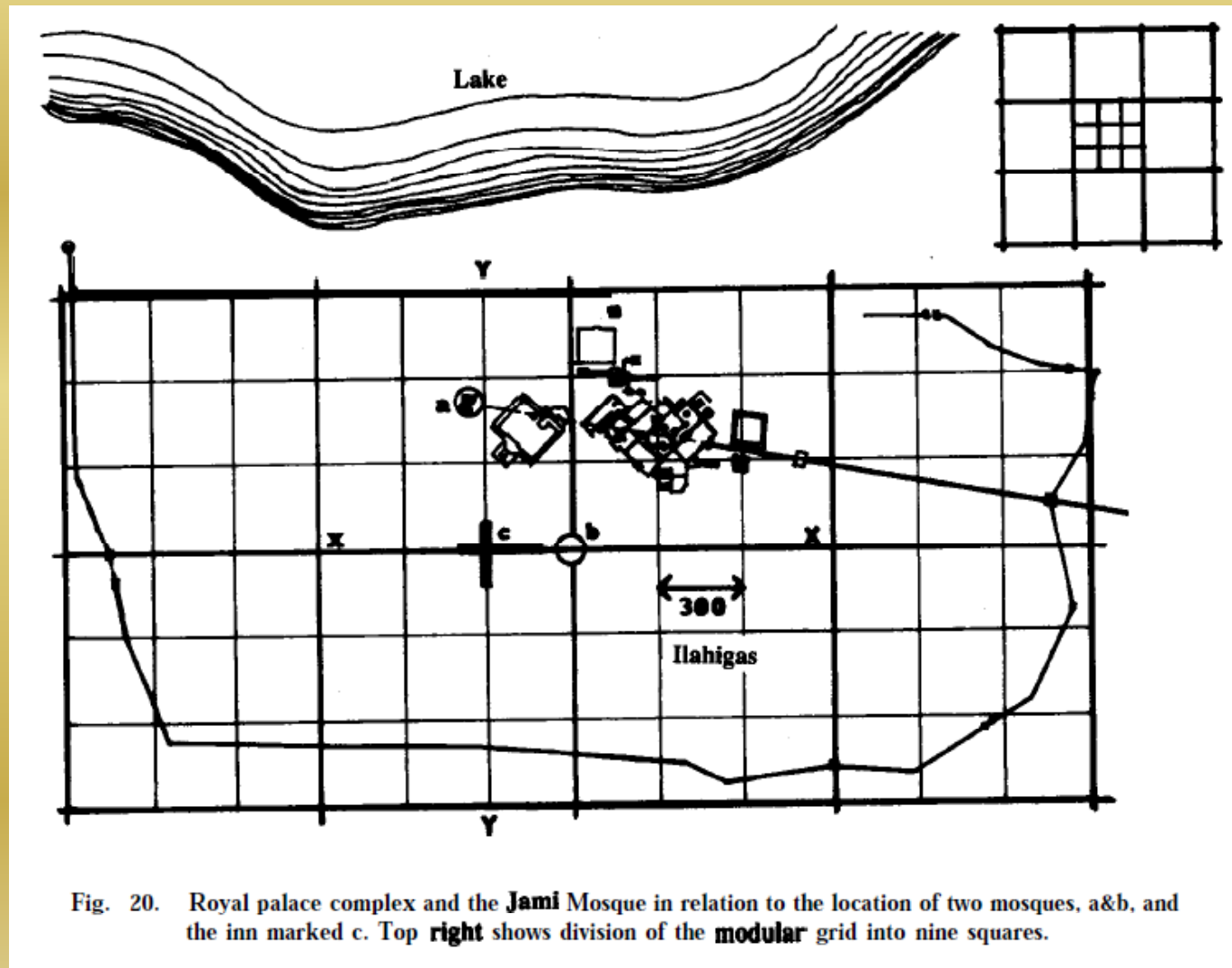
Fig. 20. Royal palace complex and the **Jami** Mosque in relation to the location of two mosques, a&b, and the inn marked c. Top **right** shows division of the **modular** grid into nine squares.

Hiran Minar

- Akbar had a penchant for elephants and loved to break and control wild elephants. It is possible that it was his way to emphasize his skill at controlling the elephants.

- Another theory says that the emperor used to watch from this tower the combat or killed the animals, driven together for his diversion.

- Yet another theory says that the royal ladies used to watch from this tower Akbar's antics with the elephants.
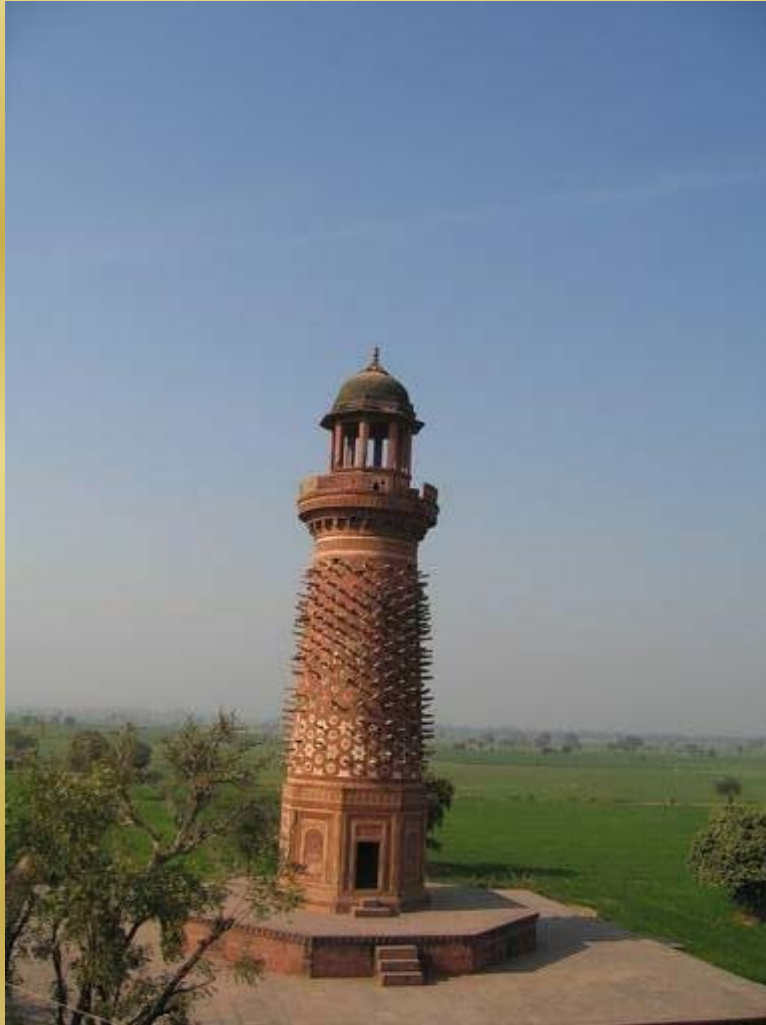
- The local guides say that the tower is the tomb of Akbar's favourite Elephant named '*Hiran*' (meaning: antelope/deer) on whose back Akbar had fought and won many battles and the marble spokes represents the studded armour of his elephant.

SHAHJAHANABAD   Introduction

- By the time the emperor Shah Jahan (1928-58) came to the throne, the Mughal empire had ruled continuously over northern India for almost a century and the artistic tradition of Mughals had reached a stage of maturity and refinement. During Shah Jahan's rein the architectural development was remarkable due to his interest and patronage of architecture. His buildings were characterized by sensitivity and delicateness.
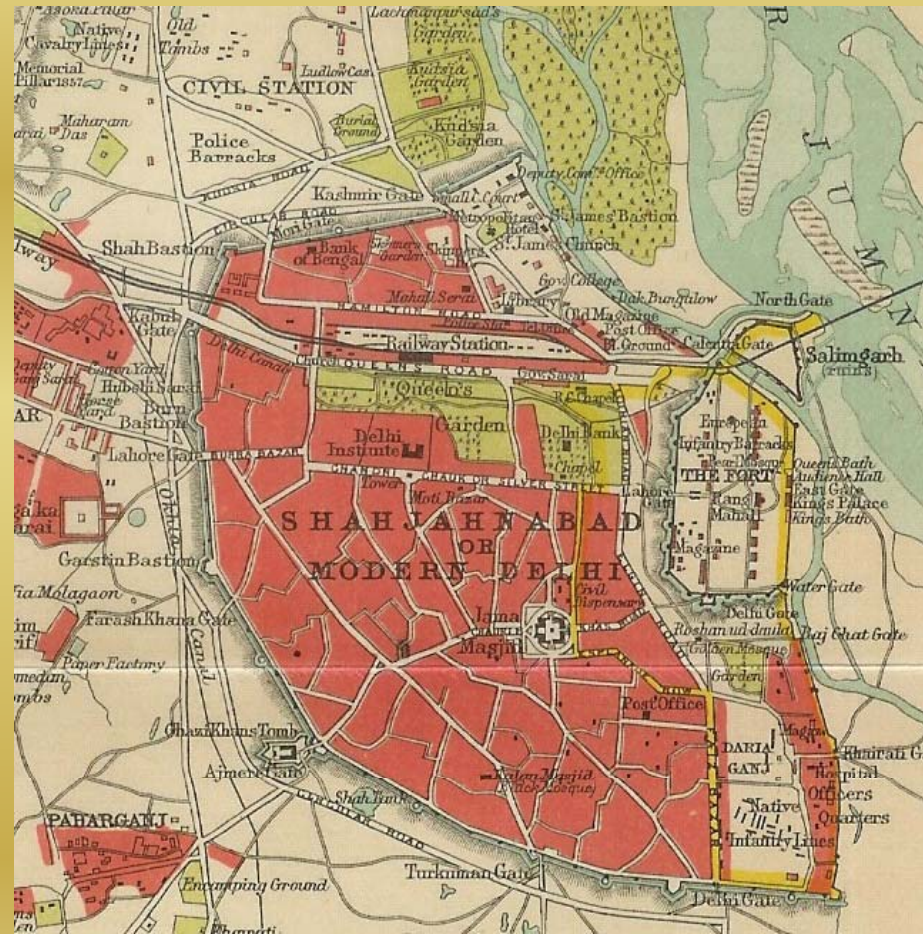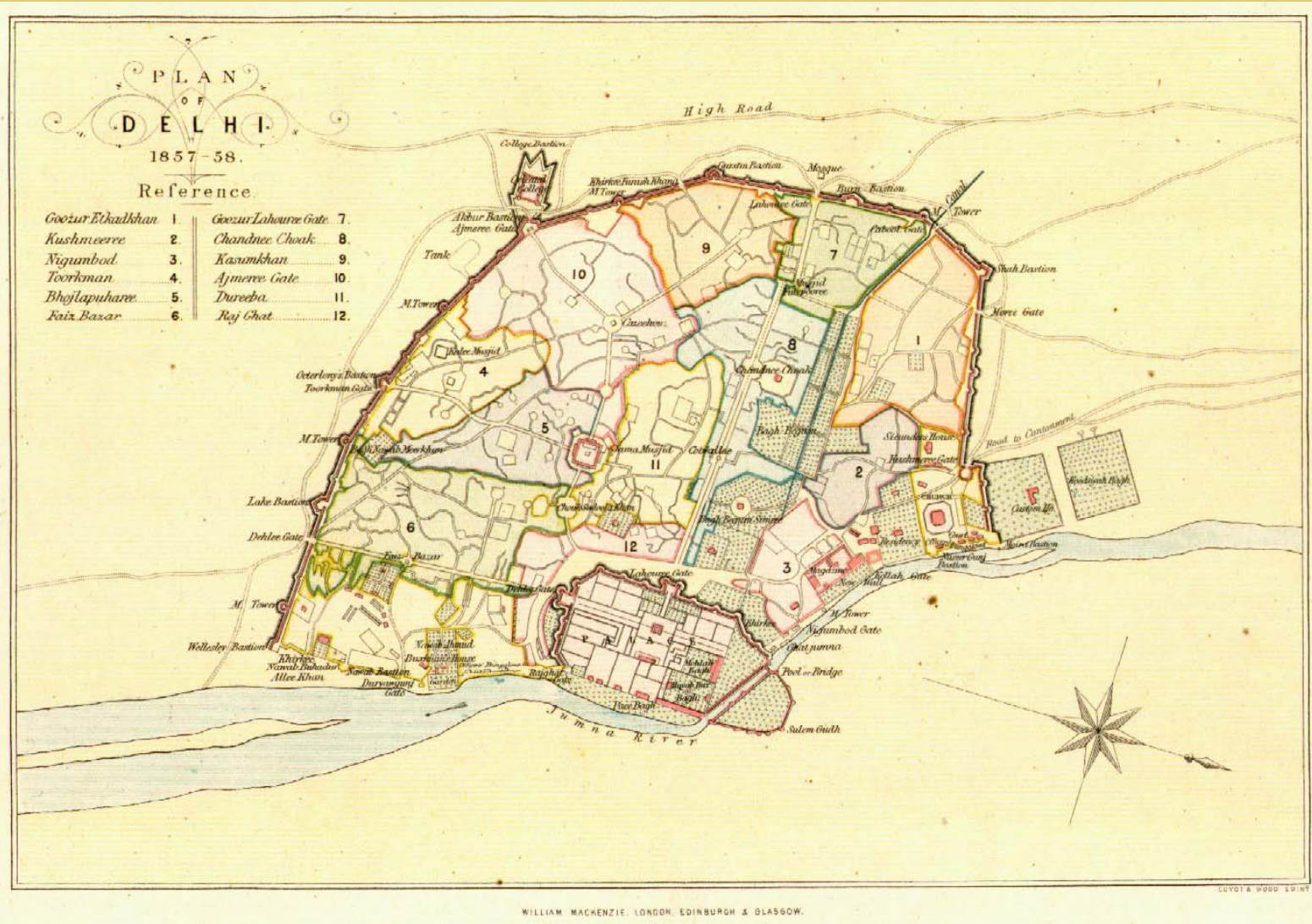
Background

- The Mughal period from Akbar (1566-1605) to Shah Jahan was comparatively long and peaceful; it was marked by the development of cities. Shah Jahan established residences in Lahore, Agra and Delhi. In 1638, he laid the foundations of new capital, centered around Lal Qila or Red Fort. This was an improvement on the citadel in Agra, because of the experienced gained by Shah Jahan, where limited space and narrow streets made it difficult for the processions of his troupes.

- The site for the new capital in Delhi was ideally suited as a convergence point of land routes, being centrally located geographical. The site was situated on the western bank of river Yamuna where a natural projection formed a triangle with the land and the river.

Muslim Urban Life

- By Shah Jahan's time, the Muslims in India had partially Indianized.

- Under the Mughals, they were mainly an urban community, and they disliked village. Muslim life was closely linked to religious event, as well as to ceremonies and festivals or ritual events.

- Shah Jahan was a religious person and was very particular about observing ceremonies. On the morning of the most important Muslim festival Eid-i-Qurba (the fest of the sacrificed), Muslims go to Id-gah, or place of prayer, generally situated outside the city or village in an open space. The Id-gah of Shahjahanabad is located on the crest of the ridge, west of the city.

Spatial Structure

- Urban spatial structure of Shahjahanabad was different from that of the other Mughal Capitals, because it was planned and built by one concentrated planning effort.

- Creation of architectural expression of what has often been called the patrimonial system in its climax.

- The shurafaur ignited from the qasbah garrison posts & admn. settlements in which Islamic scholars also met their clients & where an integrative or even syncretists cultured prevailed – usually established around a tomb or a waqf .

- The shurafa usually were situated to the west of the place, along one of the two boulevards at Chandni Chowk, & originated from the employer's palace, thus furnishing the city with an unequivocal structure.

- Those professional groups delivering fresh agrarian products to the city must have settled along the southern and south-south-western rim of the city walls (Delhi gate & Turkman gate): this is where institutions , such as Masjid gadarion (shephered's mosque), Masjid kasai (butcher's mosque) were located. They all represent "low ranking traders".

- The closer to the core of the city the more socially recognized are the professional settled there: weavers, producers of wool, traders of saddle- horses, oil- extractors & manufacturers of straw goods, each of them represented by their respective mosques.

- Further, in the direction of Chandni Chowk, mostly representative of the trading professions, e.g. traders of fabrics, fish, meats and luxury goods, but also some of the professional groups processing goods, e.g. producers of water pipes can be found, all of them are characterized by the spatial proximity to the imperial house.

Planning of Shahjahanabad

- The city was planned according to hindu planning principles of shilpashastra from vastushastra.

- The site was placed on a high land as in the shastra and was karmukha or bow shaped, for this ensured its prosperity.

- The arm of the archer was Chandni Chowk.

- The string was Yamuna river.

- The junction of the two main axes is the most auspicious point in the whole region and was therefore the red fort.

THE CITY OF DELHI BEFORE

Delhi und seine Umgebungen.

Gefängniß. 30. Straße nach Kotub. 33. Signalthurm. 36. Kantonnement und Wasserleitung. 40. Arm der Dschamna. 43. Dschanani Dschol. 46. Sikunder's Haus. 49. Aschmirthor. 52. Bagh Nabab Mirkhan. 55. Türkenthor. 58. Durpawgunj-Thor.
Redoute. 31. Gorgaonstraße. 34. Metcalfe-Haus. englisches Lager. 38. Mohitta KhanSeria. 41. Magpur. 44. Musdschid Futtepur. 47. Residenz. 50. Kirki-Furaschthor. 53. Delhithor. 56. Octerlonysbastion. 59. Buz Khans-Haus.
Straße nach Agra. 32. Kikaf Gurj. 35. Englische Batterie. 37. Ajufgbur Thil. 39. Kudsia Bagh. 42. Dschamna Musdschid. 45. Dschol Saddula Khan. 48. Collegsbastion. 51. Kali-Musdschid. 54. Wellesley-Bastion. 57. Rawathor. 60. Wasserleitung.

The city form- morphology elements

- The urban infrastructure was laid out in a geometric pattern.
- Shows traces of both Persian and Hindu traditions of town planning and architecture with the Persian influence largely accounting for the formalism and symmetry of the palaces gardens and boulevards.

The designed infrastructure of Shahjahanabad comprised-

- The fort
- The Friday mosque.
- The other major mosques, including the corresponding waqf properties.
- The two main boulevards.
- The bazaars around the Friday mosque.
- The elaborate system of water channels.
- The major gardens and the city wall.
- The arrangement of these planned elements was influenced by certain site features, which precluded absolute geometry.

The Fort & The Mosque

- The Red Fort and Jama Masjid were thorough fares that framed the city.

- From Lahore Gate ran a broad avenue with a covered arcade designed and paid for by Jahan Ara- that housed over 1500 shops. Today known as Chatta Bazaar.

- The remainder of Shahjahanabad took shape within the city walls with its havelis mansions, mosques, temples, Sikh shrines and the gardens of the nobility.

- The walled and guarded establishments of these grandees included private living quarters for the nobles and their harem.
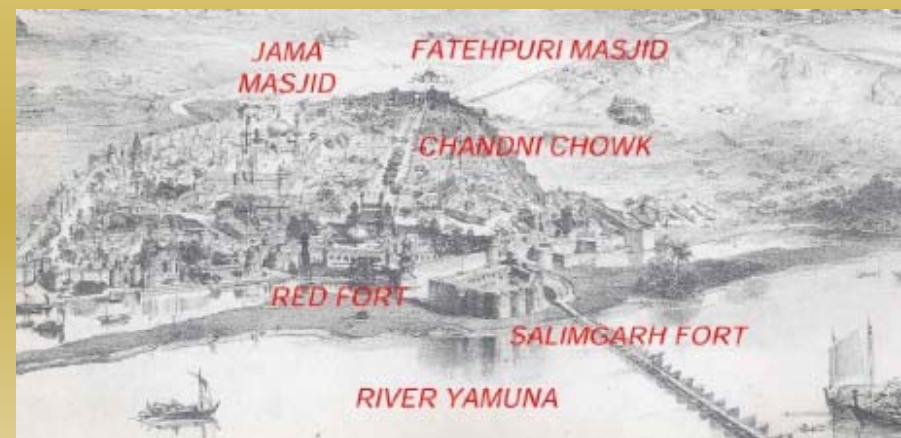
138 Juma Musjid. A. D. 1629—1658.

The Red Fort (Palace Complex)

- The plan of the fort was made by Shah Jahan and two Muslim architects. The foundation stone of the fortified place was laid in 1638. Construction work began in 1639 and was complete in just nine year. The palace complex, located along the western river front was built as an ideal residence for the emperor, it was conceived and designed as a paradise on Earth. The layout of the fort was drawn on a formal geometrical plan actually an irregular octagon with two long sides on east and west. It had two gates, that on the west was called the Lahori Darwaza, while that on the south was the Delhi Darwaza. Bearing on the cardinal points, the elements of the fort were arranged in the geometrical pattern that reflected the life and customs of Mughal court.

Jami Masjid

- The Jami Masjid was the principal mosque of the capital, the congregational centre and one of the most important institutions for the Muslims in Shahjahanabad. Shah Jahan commenced building the mosque in 1650, and completed it 6years later. It was located at the central part of the city and on a raised foundation at the top of a hill 9mts above the street level.

- The mosque dominated the walled city as a visual as well as a spiritual symbol of supreme god. Its architectural design followed by traditional style, but improvements were made here as well. Te courtyard was large and was enclosed by pillared corridors. Its layouts, having a main entrance on the east, was geometric and the whole mosque faced west towards Mecca. Muslim urban life was closely evolved around the Jami Masjid.
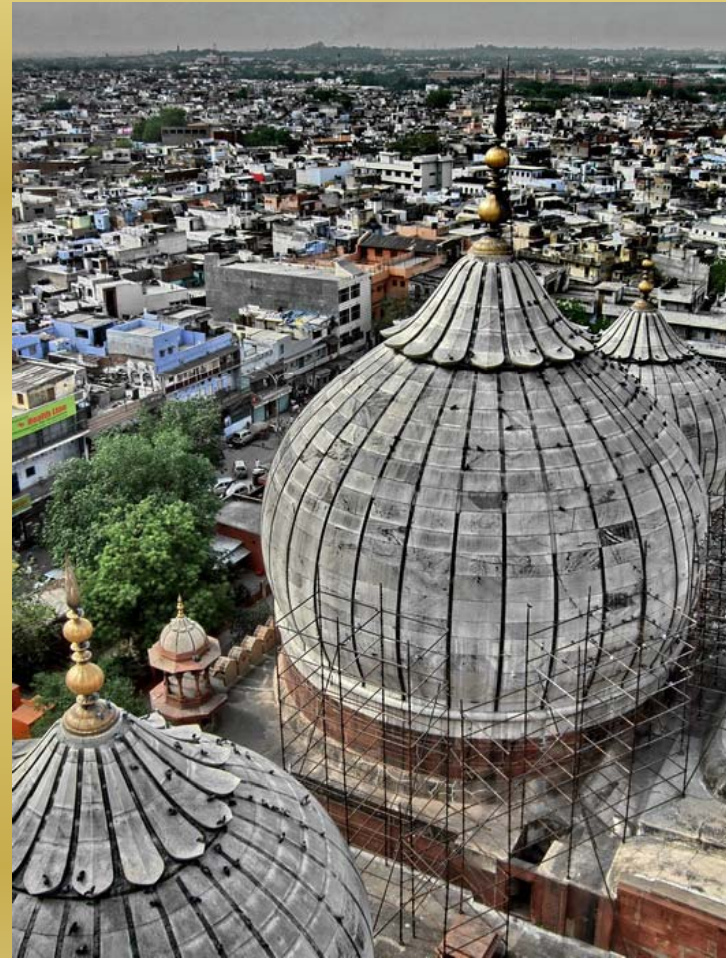
Major Streets

- The streets in Mughal capital were usually narrow and crooked. However, the major streets in the new capital were designed as wide and straight. The east-west street called Chandni Chowk connected the Lahori Darwaza of the fort to the Lahori Darwaza of the city wall. It ran in a straight line forming a wide boulevard with broad vista. The Fort was visible from any place on the street. This perspective view marked a new concept of town planning for the Mughal capital. Chandni Chowk is 1.4km in length and jogged right at the Fatehpuri Begum Mosque. It was built as the central axis of the city. Karawan Sarai and begum ki Sarai were also located in this area.

- Another main street the Faiz Bazaar or Akkarabadi Bazaar, was also wide and straight. It had a north-south axis and connected Delhi gate of the fort with the city walls Delhi gate and is about 1km in length. These major two streets developed as processional routes, as well as commercial arteries. The streets also assumed importance for ritual events.

Five Main Streets

- The basic network of the five main streets extended from Chandni Chowk and Faiz Bazaar to other gates and to different part of the walled city. The streets were built as the spines of major activities and developed as commercial thorough affairs. They connected the Ajmeri Darwaza with the Jami Masjid and Turkman and Lahori Darwazas. Their intersections formed a landmark. Important buildings were located on these arteries. The other streets were less significant and were mainly built as access roads to the residential areas.

MAHALLA / KATRA

- There was a tendency of the cities' population to settle by ethnic affiliations and to live in the same neighborhoods. The urban community and the Mughal capital was formed by such districts or wards, known as mahallas and katras. These homogeneous units also define cultural as well as socio-economic activities. There were 36 mahallas in the walled city. Each katra had an enclosed space created between residential and commercial buildings having entry to a katra made through a gate.

- These courtyards were environmentally sound and acted as main ventilation shafts in a hot and arid climate. Communal open space was conspicuously absent as it is so today. There was not much need for communal open space, other than for worship which is why the Jami Masjid was provided with a spacious courtyard.

- Thus, it is clear that planning of a residential area in the Mughal capital did not provide for social units.

Streets, Bazaars, Chowks

⭕ The city was separated from the surrounding land by a wall and a moat. Passing through the city's gates marked the passage from one domination to another. The main thoroughfares , the secondary roads and the bazaars were public space.

Havellis

⭕ The members of the imperial household whio lived outside the fort/ palace built large mansions (havellis) on the model of the imperial design of the red fort. As a rule these city palaces accommodated not only the owner and his family, but also their numerous followers, servants, and craftsmen with their workshops. The internal organisation of the space within the havellis was therefore also based on the strict distinction between the public, semi private and private spaces.

Interior courtyard of a Havelli in the walled city

⭕ Notice the spill out of day to day activities in the courtyard- thus the typology was not only suited climatically but also enhanced the living.

Streetscapes

- There emerges a hierarchy of streets in the layout of the city.

- The secondary streets were the ones which entered the south of the city from Chandni Chowk. (thus they were perpendicular for some distance and then assumed an organic form once deep in the city).

- The secondary street structure also includes the streets that are parallel to the city walls- forming a concentric ring so to say, in the southern part of the city. They then intermingle at chowks with the third layering of streets, which derive their character from the fact that they are perpendicular to the main mosque, Jama Masjid.

Shahjahanabad (Old Delhi)
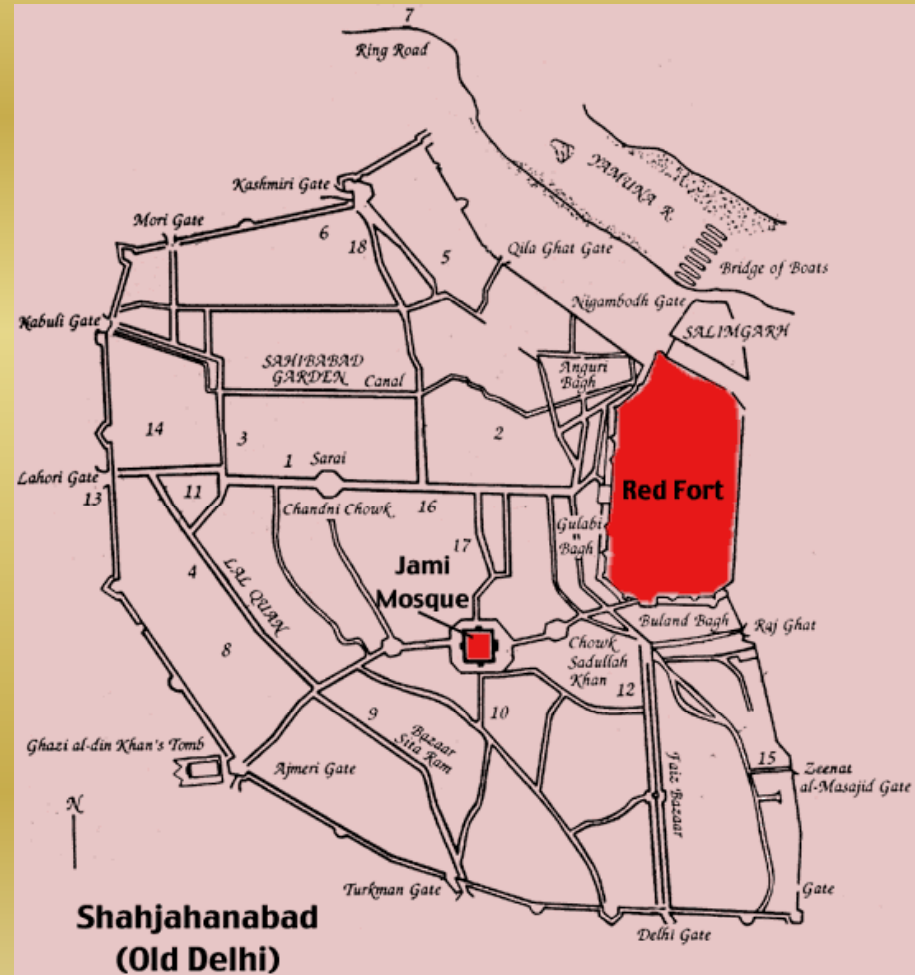
Bagh

- The north area of Chandni Chowk was occupied by a bagh called the Jahanara Begumi's Garden. It was laid out in a planned fashion, in addition to the road planning of Chandni Chowk.

CITY WALLS

○ The layout o the city walls was based on a geometrical planning; i.e. to say, a polygonal plan with gateways. The four main gates were Delhi Darwaza on south, the Ajmeri Darwaza on the south-west, the Lahori Darwaza on the west and the Kashmiri Darwaza on the north. These important gates were positioned according to the basic network of the city, being laced on the cardinal points. The graphic representation of the city was indicated geometric planning and the geometric placement of the main gates.

Conclusion

- The new Mughal capital and the fort were designed as an ideal city and a paradise on Earth.

- The design and planning methods were geometric and provided for green areas (gardens) and water facilities.

- Principal elements in the town planning were the fort, the Jami Masjid, two major streets, city wall and gates, the Bagh, the Id-gah and the Karawan Sarai.

- The Red fort was designed as a symbol of Muslim power and as an ideal living space on a formal geometrical plan.

- The Jami Masjid was designed as a symbol of Muslim power and of the capital.

- Two major streets were developed as the central axis and as processional routes and they were new elements in the capital; the design and the planning method was a new concept in town planning in the Mughal capital.

- Planning in the capital did not provide planning of residential areas.

- The city wall and gateways were drawn on a geometrical plan.

- Urban forms and patterns developed on there own in response to the emperor's basic need and idea and little attention was paid to the social planning.

Jaipur

Reasons for Maharaja Sawai Jai Singh to change his capital from Amber to Jaipur
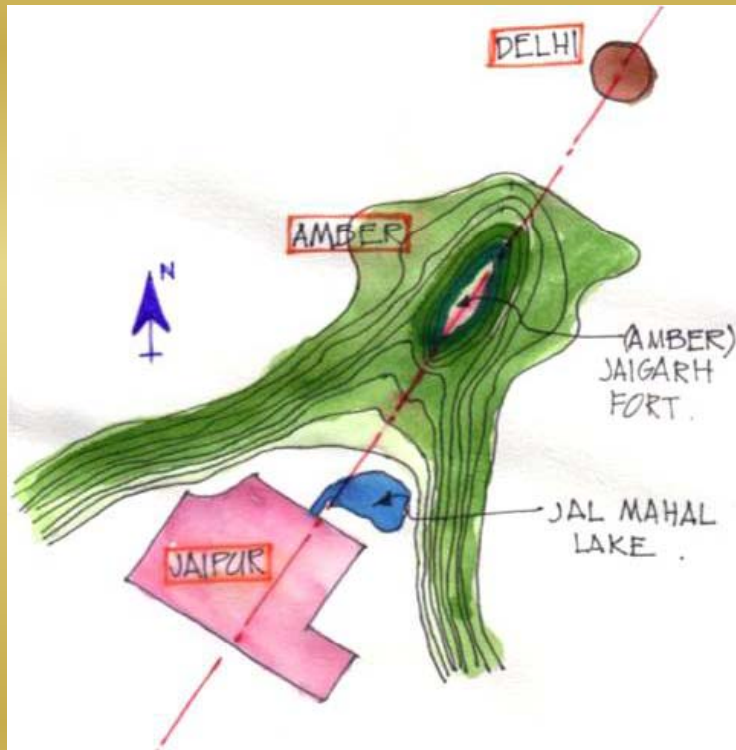
- **Military Reasons**
- **Geographical Reasons**
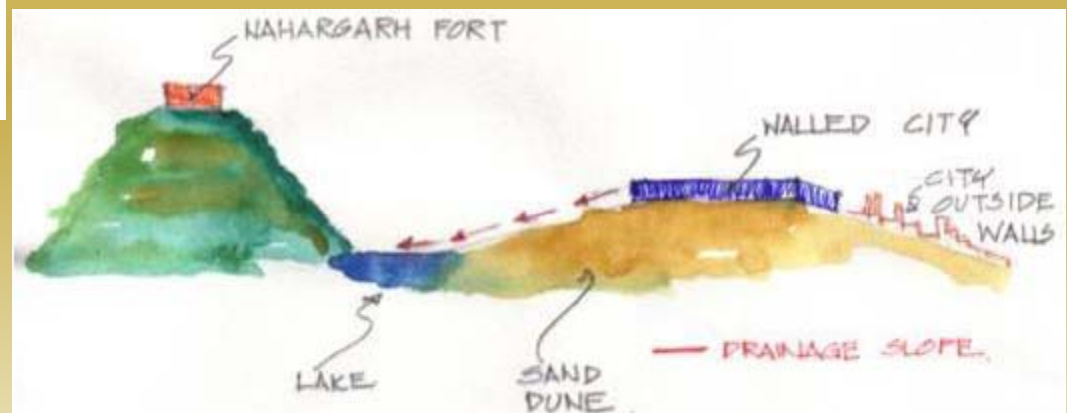
Two significant facts responsible for the origin of the city and its subsequent layout
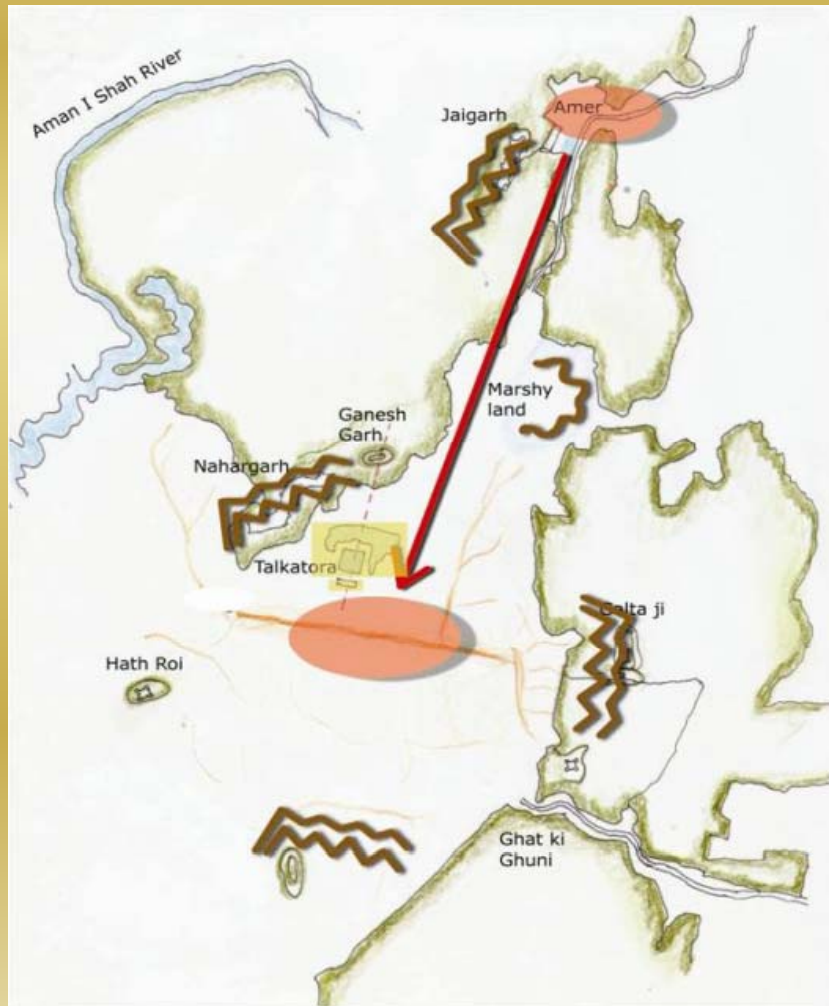
- The need of a new capital for 18th century Dhoondhar as the earlier one of Amber built on a hill was getting congested.

- Sawai Raja Jai Singh's vision of the new capital as a strong political statement at par with Mughal cities and as a thriving trade and commerce hub for the region.

- The layout of the city of Jaipur wonderfully links the concept of a Shastric city with the practicalities of the chosen site.

- First, the straight line of the ridge suggested itself as the route for one of the main east-west thorough fares and building a road along its crest makes best possible use of the topography for the purpose of drainage.

- What followed then was to regularize the Amber-Sanganer road as a north-south route at right angles to it.

- The point of intersection would be one of the city's main cross-roads (chaupar)

- The southern boundary of the city had to lie within the line of the Agra-Ajmer road. So by extending the NS road as far as possible southwards gives the first fixed dimension, the length of a side of a square and so establishes the size of the unit or module of the city.

- A road cutting the plain from N to S linking Amber,the capital to Sanganer, the principal trading town. This road had to be preserved and controlled and therefore had to fall within the city's boundaries

- A second road ran E to W between the Mughal cities of Agra and Ajmer and placing the new city on this already established communication line would help secure its economic success. However since this was an imperial road that could not be encroached on, thus the city had to be contained to the north of this line.

27 Conjectural reconstruction of the site for Jaipur.

28 Establishing the city's axes on the site.

29 Developing the site as a *mandala*.

30 Accommodating the western and eastern adjustments.

33 Base 3 vastu purusha mandala.

Prastara.
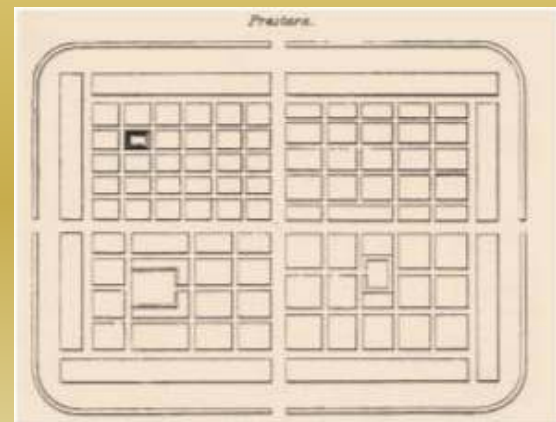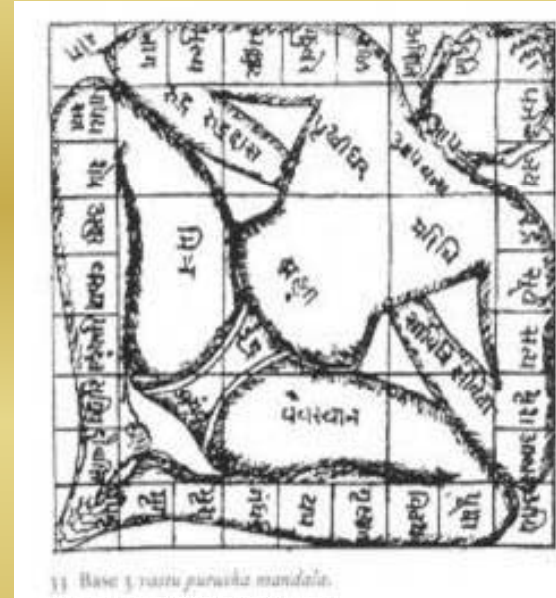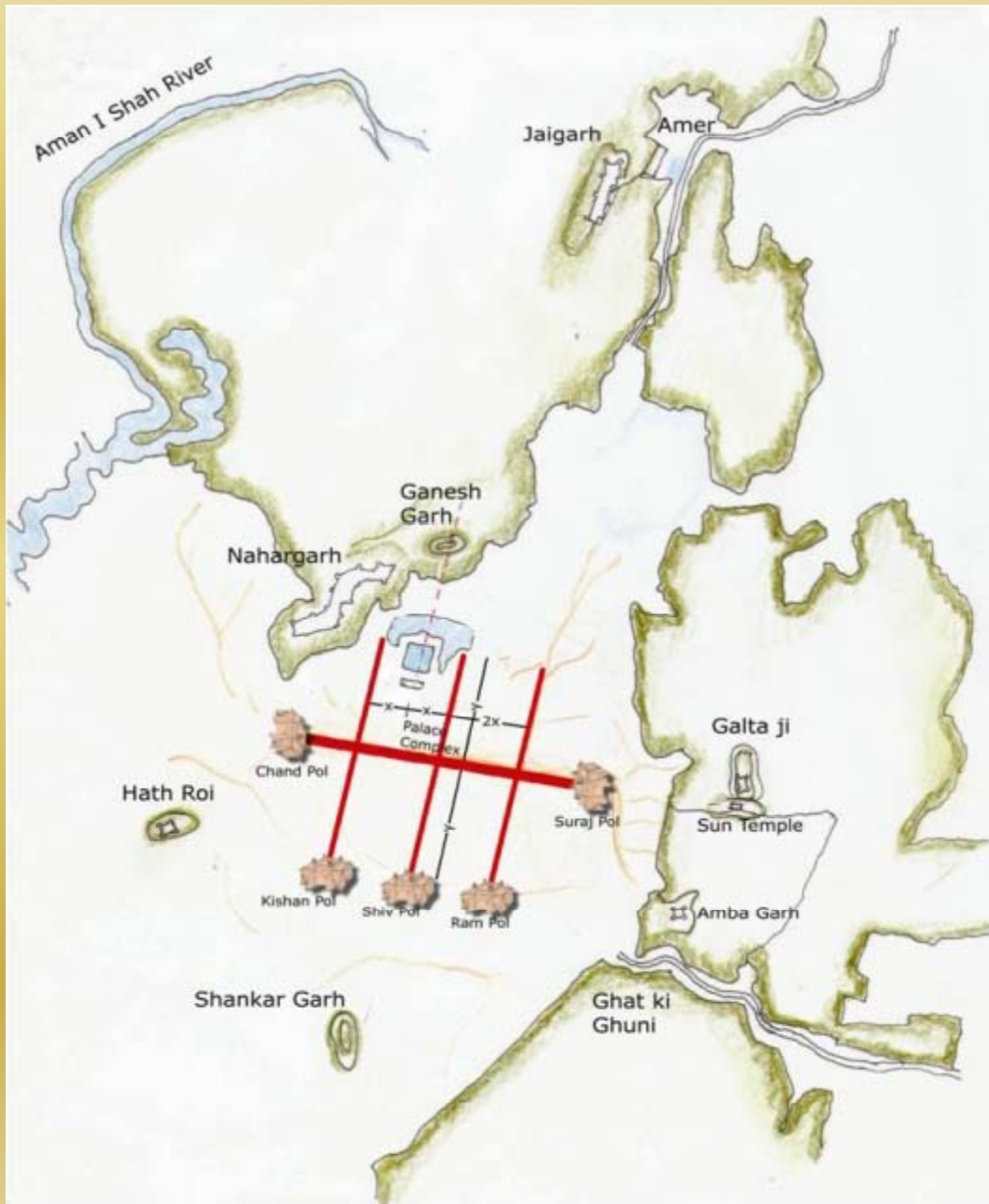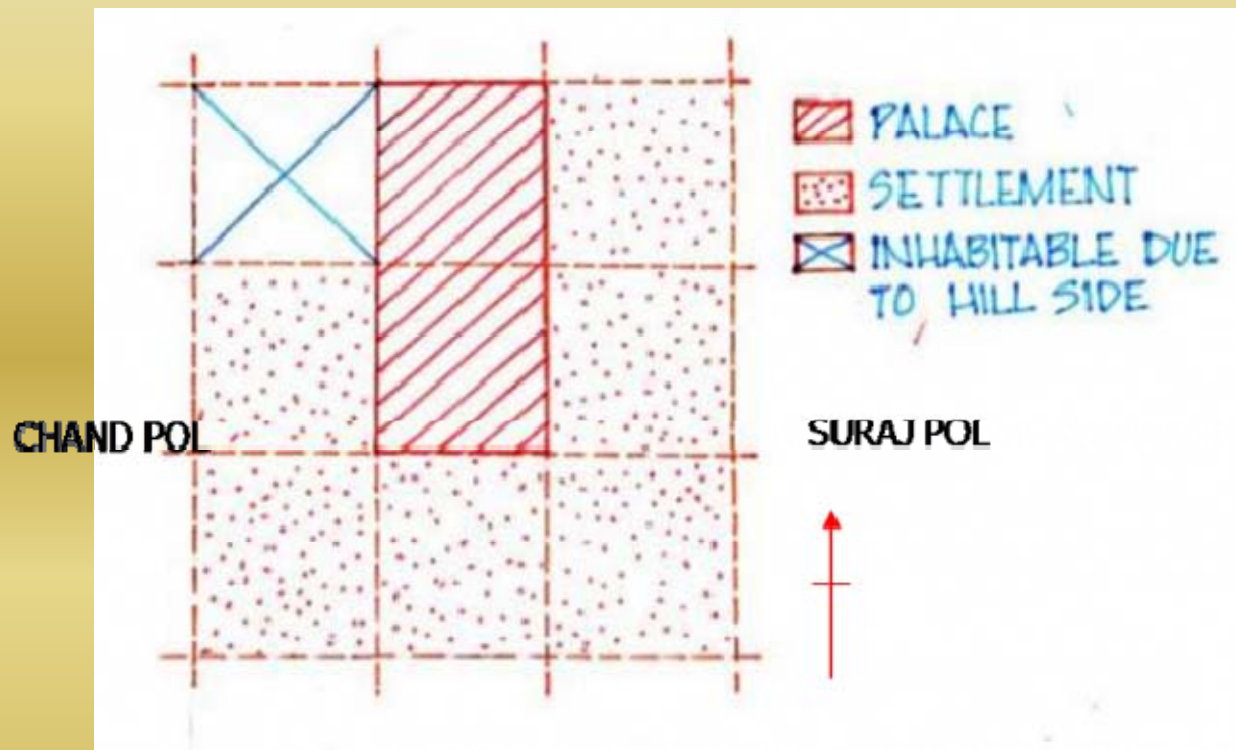
- The central axis of the town was laid from East to West between the gates of the Sun(Suraj pol) and the moon(Chandpol)
- This was crossed by two roads at right angles dividing the town into nine almost square, almost equally sized blocks, which were further sub divided by lanes and alleys all at right angles.

- The palace building covered two blocks, the town six and the remaining ninth block was not usable on account of steep hills.

- So this North-West ward was transferred to the South-East corner of the city, making the shape of the plan as a whole asymmetrical rather than square.

- The city's division into nine wards was also in conformity with the Hindu caste system, which necessitated the segregation of people belonging to different communities and ranks.

- Following the directions of the Hindu Shilpa shastra, width of the main streets & other lanes were fixed. Thus the main streets of the city were 111ft. wide, secondary streets 55 ft. wide & the smaller ones 27ft. wide.

- South of the main road were four almost equal rectangles.

- The rectangle opposite the palace has been broken up into two equal and smaller rectangles by the Chaura Rasta. Thus altogether there are now five rectangles on the south of the main road called Chowkris.

- On the North of the main road from West to East are the Purani Basti, the Palace and Ramchandraji

- Jaipur is known as the Pink City, a rather idealized description of the terra-cotta-colored lime plaster that coats the old part of the city's walls, buildings, and temples.

- The reasons for painting the town pink are unknown, but various theories have been tossed about, from using pink to cut down glare, to Jai Singh II's apparent devotion to Lord Shiva (whose favorite color is reputedly terra cotta).

- Others believe Singh wanted to imitate the color of the sandstone used in the forts and palaces of his Mughal emperor-friends.

- The most popular reason (spread no doubt by "Britishers" during the Raj era) is that pink is the traditional color of hospitality, and the city was freshly painted and paved with pink gravel to warmly welcome Edward VII for his visit here in 1876

CONCEPTUAL PLAN - CHAUPAR
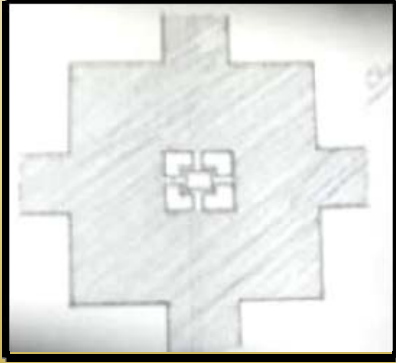
- CHAUPAR – It's a square that occurs at the intersection of east west roads with three north south roads. Each chaupar is around 100m x 100m. Were used for public gathering on festive occasions. The distance between two chaupars is about 700m which is ideal for pedestrian movement. It has controlled façade treatment enveloping it
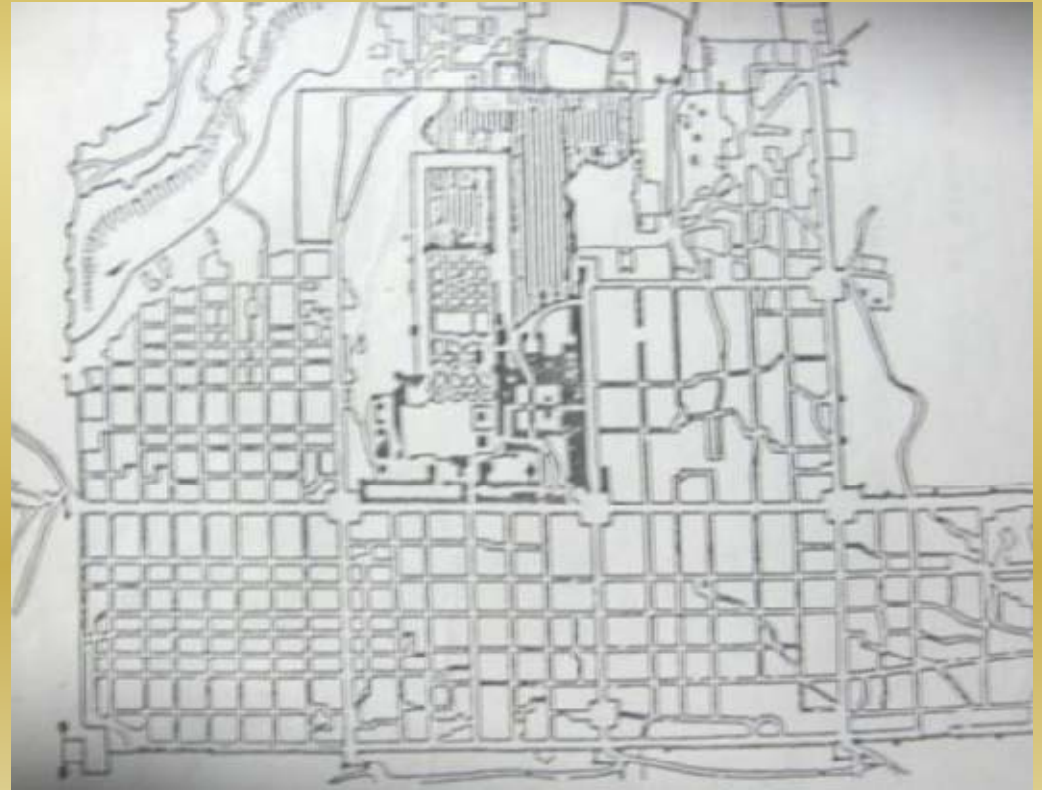
BAZAARS

- Originally only four bazaars were planned for the city. These were later named as Johri bazaar, Sireh Deori Bazaar, Kishan pole Bazaar & Gangori Bazaar

- On the main streets strict control was exercised on the street façade, along which were located shops and arcades- one storey high, but beyond the frontage the buildings could be of any height or any shape, some built with flat roofs & others with traditional chattris

SECTION THROUGH RAMGANJ BAZAAR
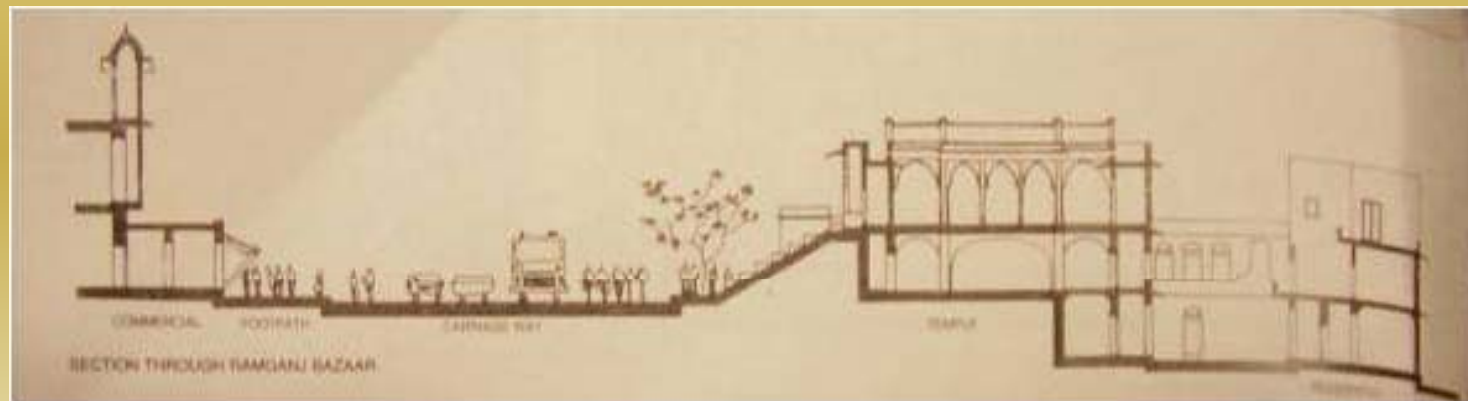
Planning of New Delhi   Introduction

- Delhi remains one of the oldest surviving cities in world today.

- It is an amalgam of eight cities, each built in a diferent era on a different site –each era leaving its mark, and adding charcter to it – and each ruler leaving a personal layer of architectural identity.

Lutyens Delhi

- He's a one-man brand for New Delhi's heritage but does he deserve all the credit?

- Lutyens' Delhi" is used indiscriminately to include the work of all the other brilliant architects who worked to build New Delhi in the 1930s.

- The only four bungalow-residences designed by Edwin Lutyens, for the private secretary, surgeon general, military secretary, and comptroller, lie hidden within the security zone of the President's Estate.

- He is the architect of Viceroy's House (Rashtrapati Bhavan) and the estate's bungalows for staff and bodyguards, as well as of the two Hyderabad and Baroda palaces at India Gate

- He was hero-worshipped by his charmed circle who cast as villains and persecutors all those who opposed him. These villains included Herbert Baker, his associate architect on whose strength he had won the contract; the viceroy, Lord Hardinge, the city's founder-patron; and a host of other collaborators-cum-antagonists.
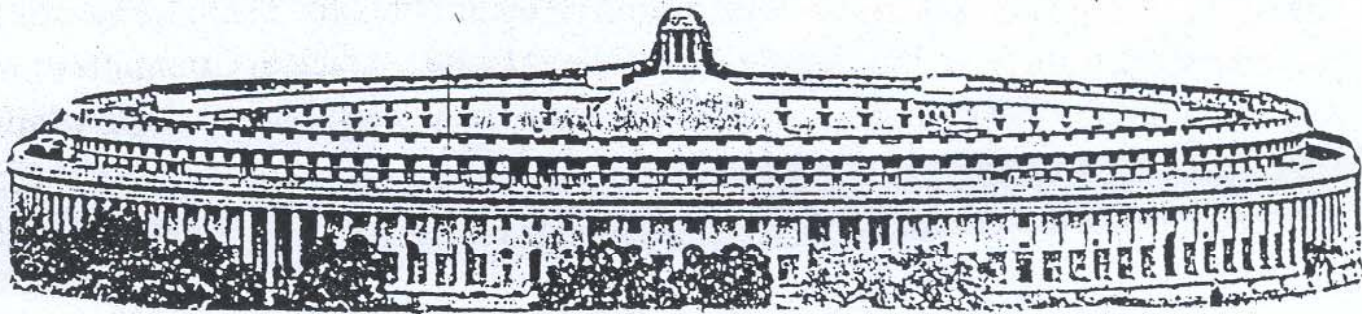
Parliament Building, Architect Herbert Baker

- **Herbert Baker** made seven bungalows and the North and South Blocks.

- **Lord Hardinge** insisted on roundabouts (Lutyens had initially designed the streets at right angles), hedges and trees (Lutyens said the trees wouldn't survive) and demanded the Raisina Hill site for the Viceroy's House (Lutyens preferred a more southern setting closer to Malcha). Hardinge also insisted on a Mughal-style garden for Viceroy's House (Lutyens was keen on an English garden with 'artless' natural planting).

- **Robert Tor Russell** built Connaught Place, the Eastern and Western Courts, Teen Murti House, Safdarjung Airport, National Stadium and over 4,000 government houses.

- **E. Montague Thomas** designed and built the first secretariat building of New Delhi which set a style for the bungalows.

- The other bungalows of New Delhi are the work of architects like **W.H. Nicholls, C.G. and F.B. Blomfield, Walter Sykes George, Arthur Gordon Shoosmith and Henry Medd.**

City plan

- Even Lutyens' layout plan cannot be considered original.

- He had initially designed a city with all the streets crossing at right angles, much like New York.

- But Hardinge told him of the dust storms that sweep the landscape in these parts, insisting on roundabouts, hedges and trees to break their force, giving him the plans of Paris and Washington to study and apply to Delhi
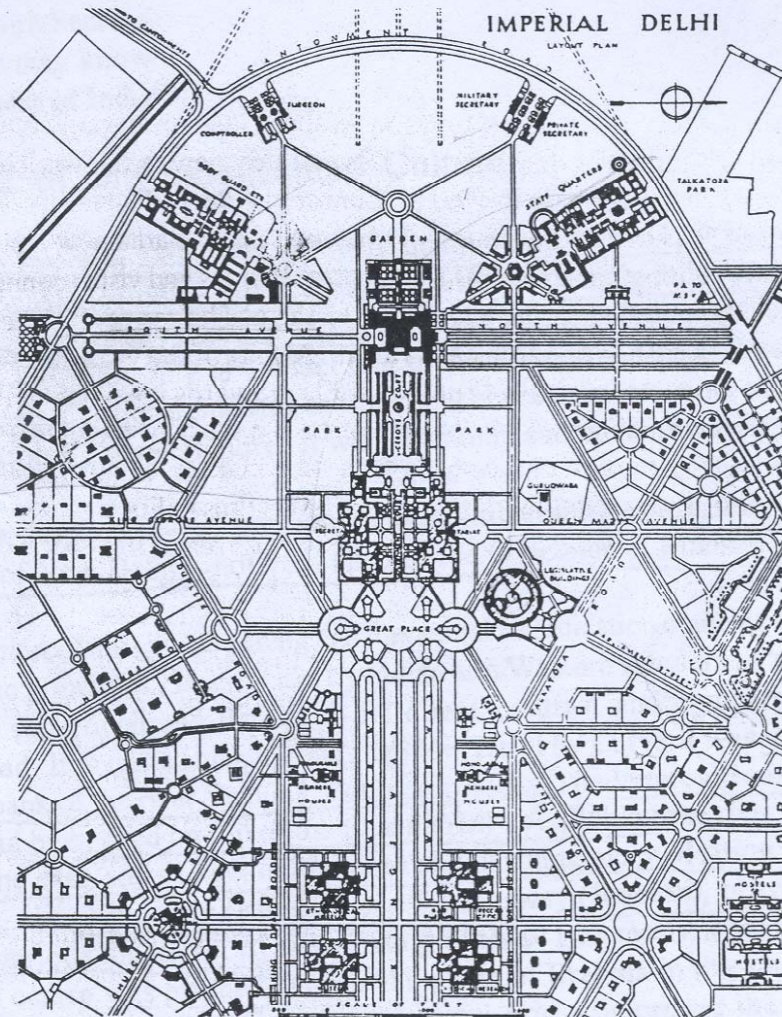
Detail of the layout of Capital Complex at Raisina, including the
Viceregal Estate, E. L. Lutyens, Architect
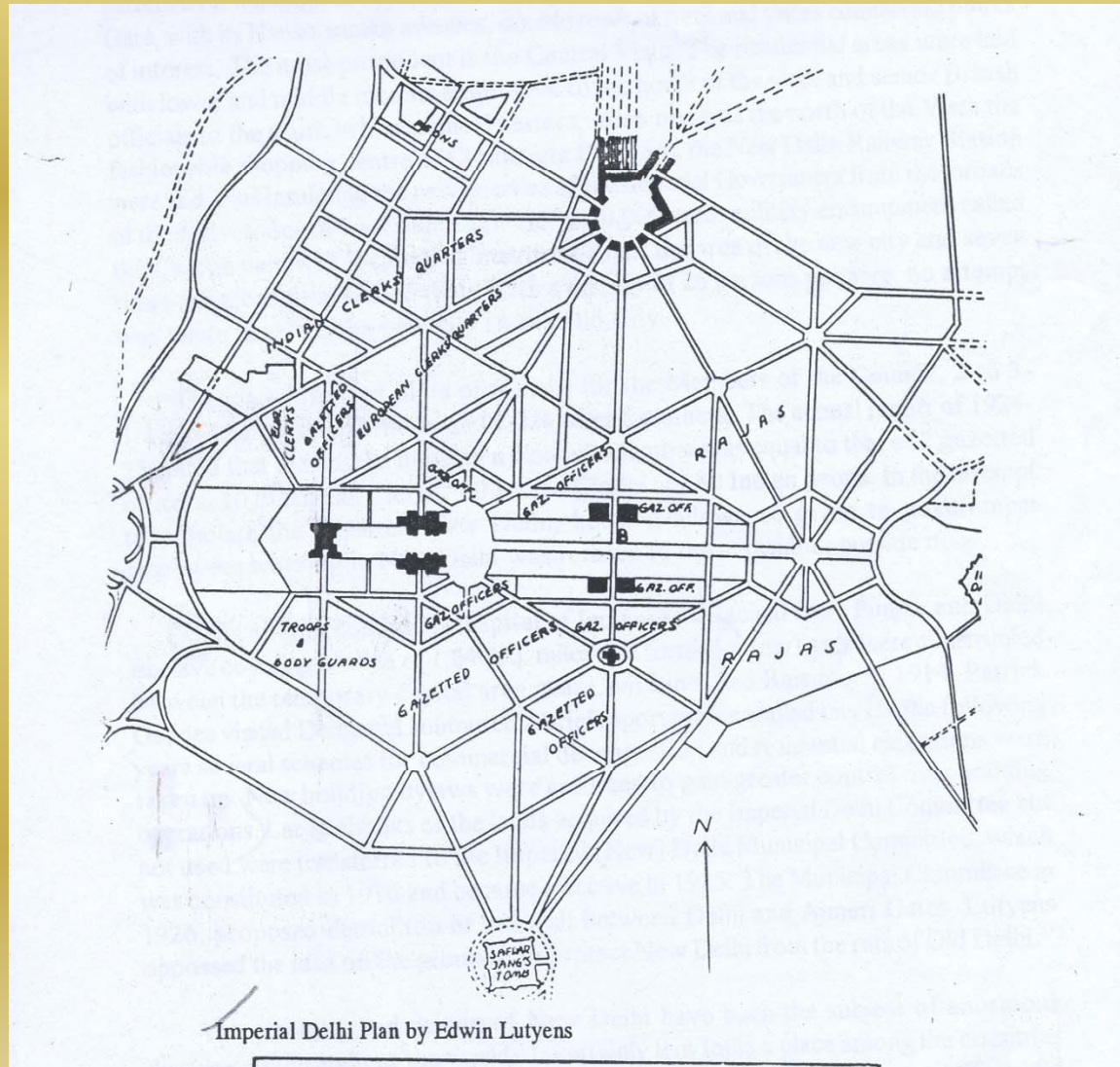
Imperial Delhi Plan by Edwin Lutyens

Choice of Site

- Lord Hardinge had suggested that the Imperial Delhi Committee consider Raisina, a dramatic rocky outcrop abutting the Ridge, as a site for Government House, but Lutyens was in favour of Malcha

- On 4 November, 1912, the viceroy, accompanied by three engineers, visited all the proposed sites and concluded that "Raisina was the best for Government House". The engineers agreed unanimously with this view.

- So the site was not chosen by Lutyens

Commanding Stature

- It was Swinton Jacob, advisor on Indian materials and ornaments, who suggested raising the ground level of Government House (or Viceroy's House), on a carefully studied contour plan—not Lutyens

Materials

- The use of the superb rhubarb-red and beige-pink sandstones for Rashtrapati Bhavan is also credited to Lutyens.

- But, he had actually opposed it in favour of white marble as used in the Taj Mahal.

- He could hardly have been aware that in white he too would have built a mausoleum.

- In fact, sandstone was suggested by the geological department, which got no credit

Trees

- It was P.H. Clutterbuck who compiled a list of 72 species of trees that would green the area successfully and reported on 18 August, 1912 that the afforestation of the Ridge was "decidedly possible". T.R.J. Ward, though an engineer, also supported this proposal.

- Lutyens, however, did not agree. He wrote 'privately' to the viceroy: "Will trees really grow on the Ridge? I could imagine them doing well for 10 or 15 years, but after that they may die off." Ward had said the reverse, that there would be a fine growth in 10 or 15 years.

- Today, Lutyens is credited for the greening of the Ridge where the trees have lasted almost a century, not just 10 or 15 years as he had warned.

The Mughal Garden

- Lutyens was keen on doing an English garden

- Hardinge forced him to travel and see the Mughal gardens of Agra, Lahore, and Srinagar.

- It was Mustoe and Walter Sykes George who landscaped and planted Lutyens' Mughal Garden where there were 17 miles of hedges to maintain

Lutyens' Loathing For Things Indian

- Is it to honour an imperialist architect who took every occasion to denounce all that was *India*—its architecture, its people, their food and their mindset.

- In fact, after he had built all there was to be built, Lutyens was even ungrateful enough to say that Indian craftsmen had broken thumbs.

- Lutyens had been unperceptive enough to pass a sweeping judgement on all of India's standing architectural heritage when he wrote: "They are just spurts by various mushroom dynasties with as much intellect in them as any other art nouveau."

- He may have immodestly imagined that the Delhi Order which he created for the capitals of his pillars would match and last with the five classical orders—the Doric, Corinthian, Ionic, Tuscan and Composite.

- They are 'dark and ill-smelling', their food is 'very strange and frightening' and they 'do not improve with acquaintance'. The helpers in his architect's office he describes as 'odd people with odd names who do those things that bore the white man'

- Lutyens came to the conclusion that it was not possible for Indians and whites to mix freely as "They are very, very different and I cannot admit them on the same plane as myself."

Lutyens Bows To Hardinge—At Last

- Eleven years before Sir Edwin Lutyens died, it seems that in a final moment of honest self-appraisal and a reckoning, he finally acknowledged the viceroy's contribution with a pricking conscience:

"This new city owes its being to Lord Hardinge...His patience and courage in times of great stress, personal and political, his even temper in the midst of diverse discussion remain in my memory as being parallel only with the greatness of his conception."

- It is a great pity that the statue of Lord Hardinge, New Delhi's founder, was removed from beneath the Jaipur Column—for this city would not have seen the light of day without him—and that Lutyens' still remains within Rashtrapati Bhavan

UNIT III

LE CORBUSIER'S CONTRIBUTION TO TOWN PLANNING

CT.Lakshmanan B.Arch., M.C.P.
AP(SG)/Architecture

TOPICS TO BE COVERED

- CIAM
- LA VILLE CONTEMPORAINE (CONCENTRIC CITY)
  - PLAN VOISIN
- LINEAR INDUSTRIAL CITY
- LA VILLE RADIUSE (RADIANT CITY)
- CHANDIGARH

Le Corbusier

(C) FLC

originally Charles-Edouard Jeanneret

1887-1965

founding father of the modernist movement

CIAM 1928

(*Congrès Internationaux d'Architecture Moderne*). At the request of a rich patron of architects, Madame Hélène de Mandrot(1867–1948), in 1928, Sigfried Giedion organized a meeting of leading Modern architects including Berlage , Le Corbusier , El Lissitzky , Rietveld , and Stam

The organization was hugely influential. It was not only engaged in formalizing the architectural principles of the Modern Movement, but also saw *architecture as an economic and political tool that could be used to improve the world through the design of buildings and through urban planning*.

- It affirmed that town planning is the organization of functions of collective life – this applies to both rural and urban settlements

- four functions of any settlement
  - dwelling
  - work
  - recreation
  - transportation, which connects the first three with one another.

- Le Corbusier organized in CIAM, Assembly of Constructors for an Architectural Renewal (ASCORAL) which systematically studied the problems of construction, architecture and city planning.

- It resulted in the publication of '***The Three Human Establishments***'. The examination of working conditions in a mechanistic society led to the recognition of the utility and necessity of three unit establishments indispensable for human activity :

- The Farming unit – the cooperative village : a unit for agricultural production
- The linear industrial city
- The radio concentric city - same as Radiant city (Ville Radieuse) for the exchange of goods and services. (modifications of la ville contemporaine)

Background of ville contemporaine : philosophy of Le corbusier

- No matter how open and green, cities should be frankly urban, urban surroundings are to be definitely contrasting with rural surroundings

- Densities are in themselves not a problem. Congestion and slum conditions in the cities are due to excessive coverage, persistence of old street patterns and unrestricted land speculation

- Slums exist because of the failure to provide the proper surrounding for high density living

- He protests against strict functionalism : "Human creations that survive are those which produce emotions, and not those which are only useful"

LA VILLE CONTEMPORAINE (CONCENTRIC CITY) 1922

City for 3 million people was proposed by Le corbusier in 1922, which was based on four principles :

- *Decongestion of the centre of the cities*

- *Augmentation of the density*

- *Enlargement of the means of circulation*

- *Increase in the number of parks and open spaces*

Plan de la ville de 3 millions d'habitants
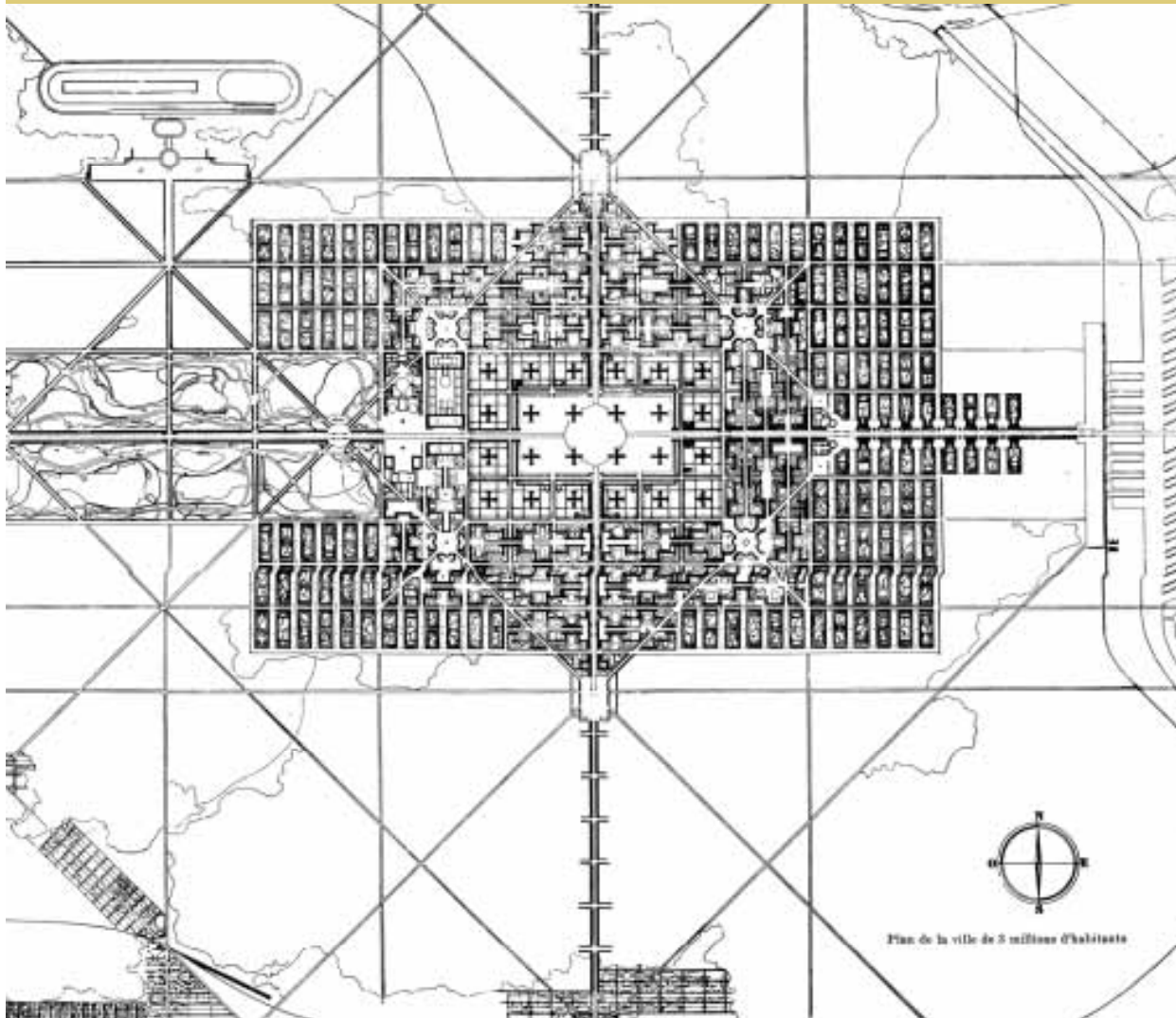
THREE ZONES
- CENTRAL CITY
- PROTECTED GREEN BELT
- FACTORIES & SATELLITE TOWNS

CENTRAL CITY

- Rectangle containing two cross axial highways

- At its heart was a six-level transport interchange – centre for motor, rail lines (underground and main-line railways) and roof of which is air-field

- 24 cruciform skyscrapers - 60 storeyed office building with density 1200 ppa and covers 5% of the ground

- Surrounding skyscrapers was apartment district – 8 storey buildings arranged in zigzag rows with broad openspaces with density of 120 ppa
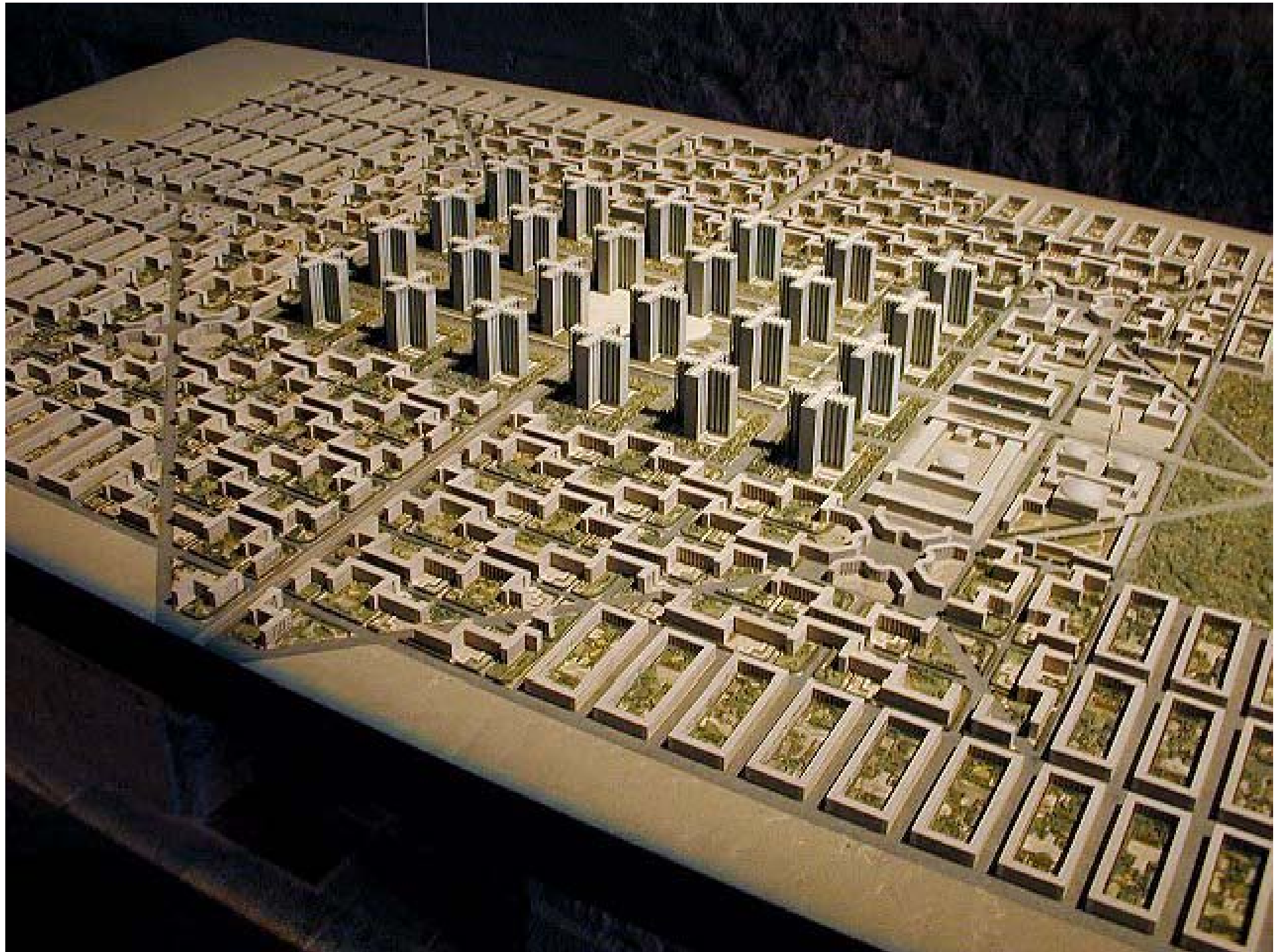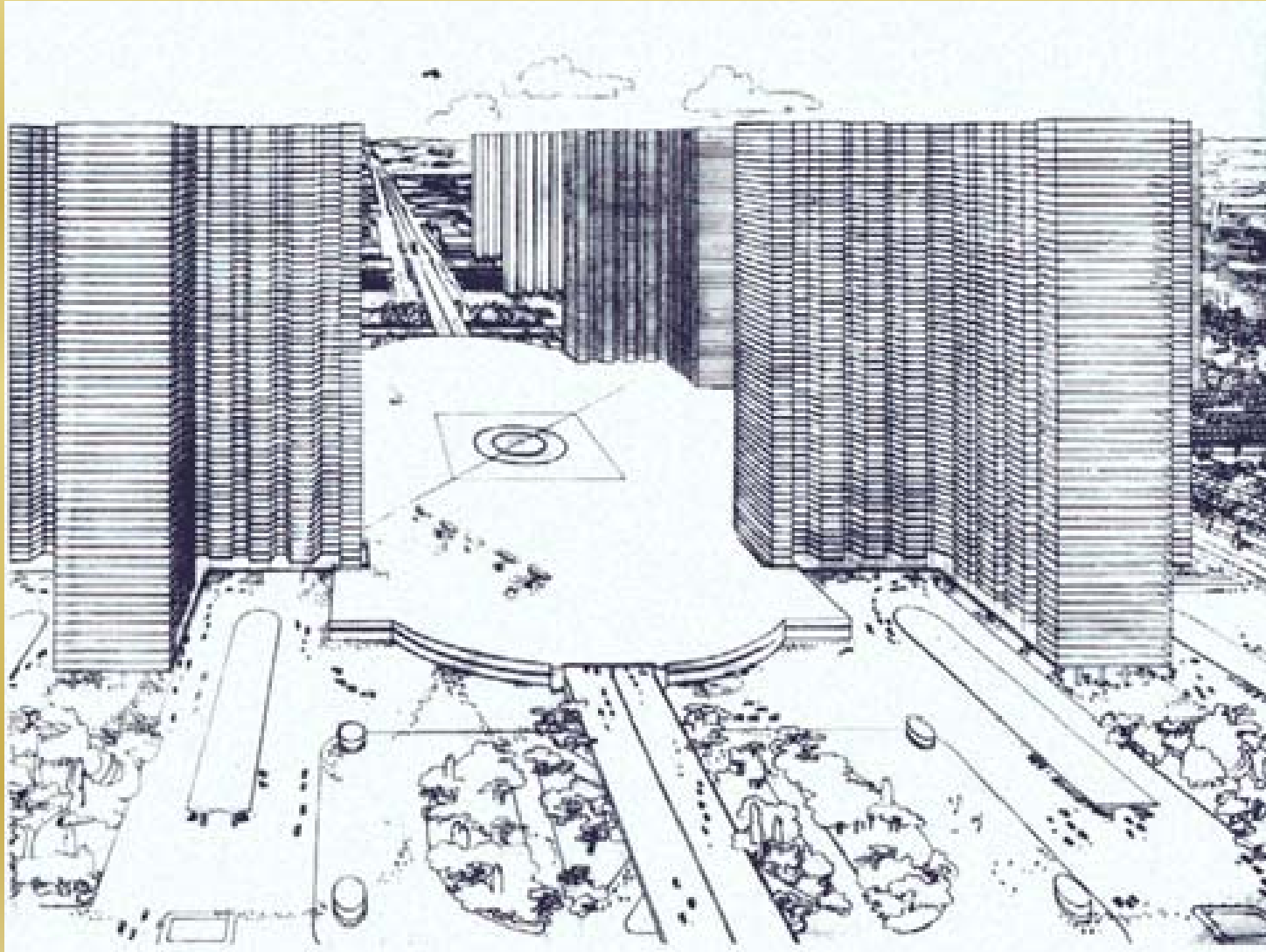
- The buildings in the central area were raised on stilts (pilotis) so as to leave panoramas of unbroken greenery at ground level

- The general impression was more of a city in a park than of a parkland in the city

- The city espoused space, speed, mass production and efficient organisation, but also offered combination of natural and urban environments

criticism

- Class based conception of life – different classes being separately housed
- Doubts were expressed about the scale and degree of centralisation

PLAN VOISIN 1925

- 18 double cruciform 60 – storey skyscrapers, placed in an orthogonal street grid and park-like green space

- Le corbusier reworked certain elements of the Ville Contemporaine & applied to a section of paris

- three clusters of luxury apartments

Street system

- Heavy traffic would proceed at basement level
- lighter traffic at ground level
- fast traffic should flow along limited-access arterial roads that supplied rapid and unobstructed cross-city movement
- pedestrianised streets, wholly separate from vehicular traffic and placed at a raised level.
- The number of existing streets would be diminished by two-thirds due to the new arrangements of housing, leisure facilities and workplaces, with same-level crossing points eliminated wherever possible.

- Critics attacked its focus on the central city, where land values were highest and dislocations most difficult

- the creation of vast empty spaces in place of close-knit streets with their varied civic life

LINEAR INDUSTRIAL CITY

- Leaving the 'evils of the sprawling town', the new industrial communities are located along the main arteries of transportation – water, rail and highway connecting the existing cities.

- Factories are placed along the main arteries, separated from the residential section by the highway and a green strip

- The residential areas include the 'horizontal garden town' of single houses and vertical apartment buildings with civic center. Sports, entertainments, shopping and office facilities are distributed in this district and all community facilities are placed within ample open space.

LA VILLE RADIUSE
(RADIANT CITY)

- Le corbusier rearranged the key features of the Ville Contemporaine.

- The basic ideas of free circulation and greenery were still present, but the juxtaposition of different land-uses had changed. For example, the central area was now residential instead of a skyscraper office core.
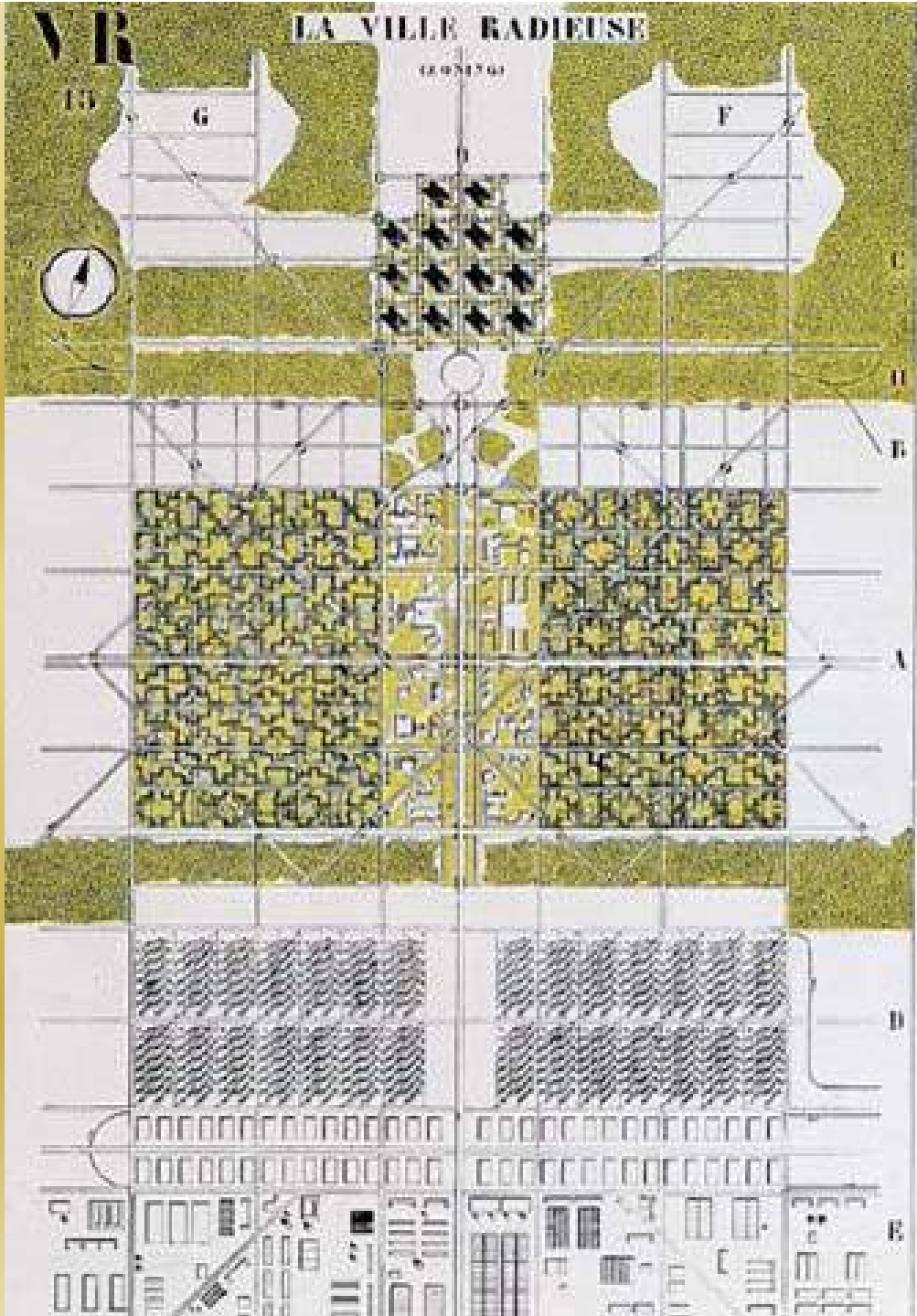
Elements of Le Corbusier's Plan

- very high density
  - 1,200 people per acre in skyscrapers
    - overcrowded sectors of Paris & London ranged from 169-213 pers./acre at the time
    - Manhattan has only 81 pers./acre
  - 120 people per acre in luxury houses
    - 6 to 10 times denser than current luxury housing in the U.S.
- multi-level traffic system to manage the intensity of traffic

Analogy of the city with the abstract image of a man

- The skyscrapers (business area) of the Ville Contemporaine were rearranged away from the city center at the 'head'…[The] 'body' was made up of acres of housing strips laid out in a stepping plan to generate semi-courts and harbours of greenery containing tennis courts, playing fields and paths.

- Traffic pattern – an orthogonal system with super imposed diagonals & the civic center is on the main axis

- Light manufacturing, freight yards and heavy industries at the bottom

Elements of Le Corbusier's Plan

- access to greenspace
  - between 48% and 95% of the surface area is reserved for greenspace
    - gardens
    - squares
    - sports fields
    - restaurants
    - theaters
  - with no sprawl, access to the "protected zone" (greenbelt/open space) is quick and easy
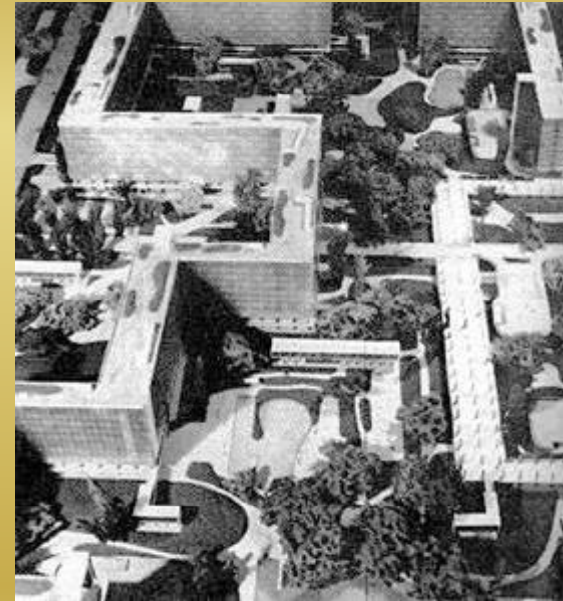
The logic of increasing urban density

- "The more dense the population of a city is the less are the distances that have to be covered."

- traffic is increased by:
  - the number of people in a city
  - the degree to which private transportation is more appealing (clean, fast, convenient, cheap) than public transportation
  - the average distance people travel per trip
  - the number of trips people must make each week

- "The moral, therefore, is that we must increase the density of the centres of our cities, where business affairs are carried on."

CHANDIGARH

SRM UNIVERSITY

Le Corbusie and Pandit Nehru

- Since punjab was divided into two parts, the capital was left in pakistan there fore punjab in india required new capital

- The first masterplan for the new capital was assigned to American engineer and planner Albert Mayer, who was a friend of Clarence Stein of Radburn fame in New Jersey.

- He worked on the masterplan with his closest assistant, Matthew Nowicki, until the latter died in a plane crash in 1950. His duties were to take the form of architectural control.

- Mayer wasn't new to India. In December, 1949, when the Punjab government approached him for the Chandigarh project, he was already associated with a rural development project at Etawah (Uttar Pradesh), and preparation of master plans for Greater Bombay and Kanpur.

- Mayer was thrilled with the prospect of planning a brand-new city, and he accepted the assignment although it offered him a modest fee of $30,000 for the entire project.

- His brief was to prepare a master plan for a city of half a million people, showing the location of major roads and areas for residence, business, industry, recreation and allied uses.

- He was also to prepare detailed building plans for the Capitol Complex, City Centre, and important government facilities and architectural controls for other areas.

- The master plan which albert mayer produced for chandigarh assumes a fan-shaped outline,spreading gently to fill the site between the two river beds.

- At the head of the plan was the Capitol , the seat of the state government, and the City Centre was located in the heart of the city.

- Two linear parklands could also be noticed running continuously from the northeast head of the plain to its southwestern tip. A curving network of main roads surrounded the neighborhood units called Super blocks.

- first phase of the city was to be developed on the north-eastern side to accommodate 1,50,000 residents and the second phase on the South-western side for another 350,000 people.

2
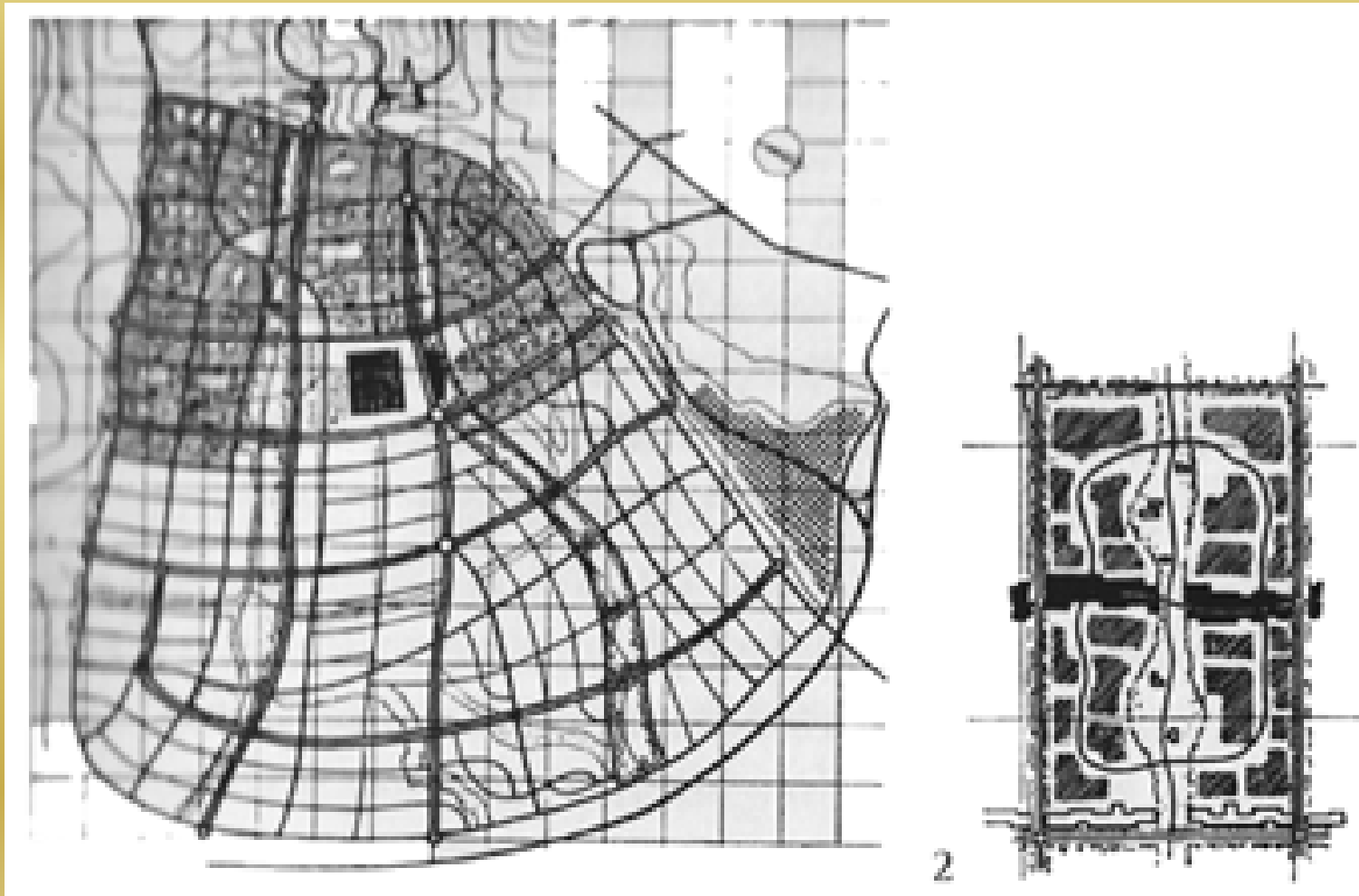
- Mayer liked "*the variation of [Indian] streets, offsetting and breaking from narrow into wider and back*" and thought that they were appropriate to a land of strong sunlight, at the narrow points, his house design involved an inner courtyard for ventilation with small openings on the street side to protect privacy.

- "*We loved this little inner courtyard,*" Mayer wrote, "*for it seemed to us to bring the advantages of coolness and dignity into a quite small house.*"

- Another element in planning was "t*o place a group of houses around a not very large court, with the ends somewhat narrowing, which could serve as a social unit—i.e. a group of relatives or friends or people from the same locality might live there, with the central area for play, gossip, etc.*"

- The neighbourhood units were to contain schools and local shopping centres.

- The flatness of the site allowed almost complete freedom in creating street layout and it is of interest to note hat the overall pattern deliberately avoids a geometric grid in favour of a loosely curving system.

- The death of nowicki necessitated the selection of a new architect for chandigarh. When mayer resigned, the indian authorities put together a new, european planning team. The two appointed administrators, verma and thapar, decided on the renowned swiss architect, le corbusier, whose name was suggested by the british architects maxwell fry and his wife jane drew.

- At first, le corbusier was not keen to take the assignment, but was persuaded by verma. Le corbusier's lofty visions and ideals were in harmony with nehru's aspirations.

- Le Corbusier requested the assistance of his cousin Pierre Jeanneret. Jeanneret eventually agreed to live on the site as his representative and chief architect.

- Le Corbusier could then visit India twice a year for a month at a time (he came to the site 22 times). Thus, Jeanneret, together with Fry and Drew, as senior architects working in India for a period of three years and assisted by a team of 20 idealistic young Indian architects, would detail the plan and Le Corbusier could concentrate on major buildings.

- All four of the protagonists were members of the Congres Internationaux d'Architecture Moderne (CIAM).

THREE DISCIPLINES

- **The discipline of money**

  Le corbuiser once remarked that "india has the treasures of a proud culture,but her coffers are empty." And throughout the project the desire for grandness was hampered by the need for strict economy. In working up his designs,le corbuiser consulted the program for each building as given in the budget and then prepared the initial project.

- **The discipline of technology**

  Available in quantity, however, was good clay stone and sand,and,above all' human labour. The materials of which chandigarh has been constructed are rough concrete in the capitol complex and the central business district and for most of the city, especially in housing,locally produced brick.

- **The discipline of climate**

  Besides the administrative and financial regulatons there was a law of the sun in india. The architectural problem consists;first to make shade,second to make a current of air[to ventilate], third to control hydraulics.

- As the most economical and readily available material for building at chandigarh was locally made brick.

- The flat roof was employed through out in chandigarh housing because of its usefulness as a sleeping area

- 70% of the building would be private in all the sectors.

- Residential plots ranging in dimensions from 75 sq. Yards to 5000 sq yards.

- Le-corbuiser was responsible for the general outlines of the master plan and the creation of the monumental buildlings,while pierre jeanneret,maxwell fry and jane drew were charged with the task of developing the neighbourhood sectors with their schools,shopping bazaars,and the tracts of government housing.

- In the program presented to the architects,13 categories of houses were specified, each corresponding to a level of government employment.

- Small windows openings have been consistently employed

- The city of Chandigarh was the culmination of Le corbusier's life.

- This city is like the man. It is not gentle. It is hard and assertive. It is not practical; it is riddled with mistakes made not in error but in arrogance.

- It is disliked by small minds, but not by big ones. It is unforgettable. The man who adored the Mediterranean has here found fulfillment, in the scorching heat of India.

GEOGRAPHICAL LOCATION

- It was bound by two seasonal choes, or rivulets, the patiali Rao and the Sukhna in the northwest and the south east respectively. It extends in the northeast right up to the foothills of the shivaliks.

- The region experiences extremes in the climate. The temperature could rise to 45 degrees in summer and drop to freezing point in winter.

- The direction of the prevalent winds is southeast to the northwest in summer and northwest to the southeast in winter.

- the basic framework of the master plan and its components the Capitol, City Centre, university, industrial area, and a linear parkland - as conceived by Mayer and Nowicki were retained by Le Corbusier.

- The restructured master plan almost covered the same site and the neighbourhood unit was retained as the main module of the plan.

- The Super block was replaced by now what is called the Sector covering an area of 91 hectares, approximately that of the three-block neighbourhood unit planned by Mayer.

- The City Centre, the railway station and the industrial areas by and large retained their original locations.

- However, the Capitol , though still sited at the prime location of the northeastern tip of the plan, was shifted slightly to the northwest.

THE BIOLOGICAL ANALOGY

Le Corbusier liked to compare the city he planned to a biological entity:

- **the head was the Capitol,**

- **the City Centre was the heart and**

- **the institutional area and the university was limbs.**

- Le Corbusier identified four basic functions of a city: living, working, circulation and care of the body and spirit

- Each sector was provided with its own shopping and community facilities, schools and places of worship. **"Circulation"** was of great importance to Le Corbusier and determined the other three basic functions.

- By creating a hierarchy of roads, Le Corbusier sought to make every place in the city swiftly and easily accessible and at the same time ensure tranquility and safety of living spaces.

THE PERIPHERY CONTROL ACT

- The Periphery Control Act of 1952 created a wide green belt around the entire union territory.

- It regulated all development within 16 kilometers of the city limit, prohibited the establishment of any other town or village and forbade commercial or industrial development.

- The idea was to guarantee that Chandigarh would always be surrounded by countryside.

INDUSTRY

- Despite his bias against industry, Le Corbusier was persuaded to set aside 235 hectares for non-Polluting, light industry on the extreme southeastern side near the railway line as far away from the Educational Sector and Capitol as possible. Of this, 136 hectares were to be developed during the first phase.

- In the event of the city expanding southward, Le Corbusier suggested the creation of an additional industrial area in the southern part of the city where a second railway station could be established.

SECTOR

- Le Corbusier and his team replaced superblocks with a geometric matrix of generic neighbourhood units, "sectors".

- The new city plan represented a general city that could, like a roman military settlement, be placed on any flat piece of land. Le Corbusier claimed that"the first phase of existence is to occupy space" and the new plan allowed for such an expansion.

- However, the city was planned to house a number of 1,50,000 inhabitants in its first phase, realized between 1951-66, and 500 000 in its" final stage".

- The neighbourhood itself is surrounded by the fast-traffic road called V3 intersecting at the junctions of the neighbourhood unit called sector with a dimension of 800 meters by 1200 meters.

- The entrance of cars into the sectors of 800 meters by 1200m, which are exclusively reserved to family life, can take place on four points only; in the middle of the 1200 m. in the middle of the 800 meters.

- All stoppage of circulation shall be prohibited at the four circuses, at the angles of the Sectors.

- The bus stops are provided each time at 200 meters from the circus so as to serve the four pedestrian entrances into a sector.

- Thus, the transit traffic takes place out of the sectors: the sectors being surrounded by four wall-bound car roads without openings (the V3s).

- And this (a novelty in town-planning and decisive) was applied at Chandigarh: no house (or building) door opens on the thoroughfare of rapid traffic.

- Taking chandigarh as an example,we may see at once the democratic idea which allows us to devote an equal care to housing all classes of society to seek new social groupings

- Each sector is designated by number,the capital complex being number 1,with the remaining sectors numbered consecutively beginning at the north corner of the city.

- There are 30 sectors in chandigarh,of which 24 are residential. The sectors at the upper edge of the city are of abbreviated size.

OPEN SPACES

- Some 800 hectares of green open space are spread over the approximately 114 square kilometers of the Capital Project area.

- Major open areas include the Leisure Valley, Sukhna Lake, Rock Garden and many other special gardens.

- In addition, the sectors are vertically integrated by green space oriented in the direction of the mountains.

LANDSCAPING

- Landscaping proceeded side by side with the construction of the city from the very inception. Three spaces were identified for special plantation: the roadsides, spaces around important buildings, parks and special features such as Sukhna Lake.

- Le Corbusier's contribution to landscaping was of categorising tree forms. He made a simple analysis of the functional needs and aesthetic suitability for the various areas, devoting special attention to specific roads.

- prominent flowering trees are gulmohar *(Delonix regia)*, amaltas *(Cassia fistula)*, kachnar *(Bauhinea variegata)*, pink cassia *(Cassia Javanica)* and silver oak *(Grevillea robusta)*.

- Among the conspicuous non-flowering trees one finds kusum *(Schleicheta trijuga)* and pilkhan *(Ficus infectoria)* along V3 roadsides.

- These trees, noted for their vast, thick spreading canopies form great vaulting shelters over many of the city's roads.

- In all, more than 100 different tree species have been planted in (Fieus religosa) Chandigarh .

HOUSING

- Lower category residential buildings are governed by a mechanism known as "**frame control**" to control their facades.

- This fixes the building line and height and the use of building materials.

- Certain standard sizes of doors and windows are specified and all the gates and boundary walls must conform to standard design.

- This particularly applies to houses built on small plots of 250 square metres or less.

7 V's

- The 7Vs establishes a hierarchy of traffic circulation ranging from: arterial roads (V1), major boulevards (V2) sector definers (V3), shopping streets (V4), neighbourhood streets (V5), access lanes (V6) and pedestrian paths and cycle tracks (V7s and V8s).

- V1 CONNECTS CHANDIGARH TO OTHER CITIES
- V2 ARE THE MAJOR AVENUES OF THE CITY E.G MADHYA MARG ETC
- V3 ARE THE CORRIDORS STREETS FOR VEHICULAR TRAFFIC ONLY
- V4…..V7 ARE THE ROADS WITHIN THE SECTORS

PLAN OF THE CITY
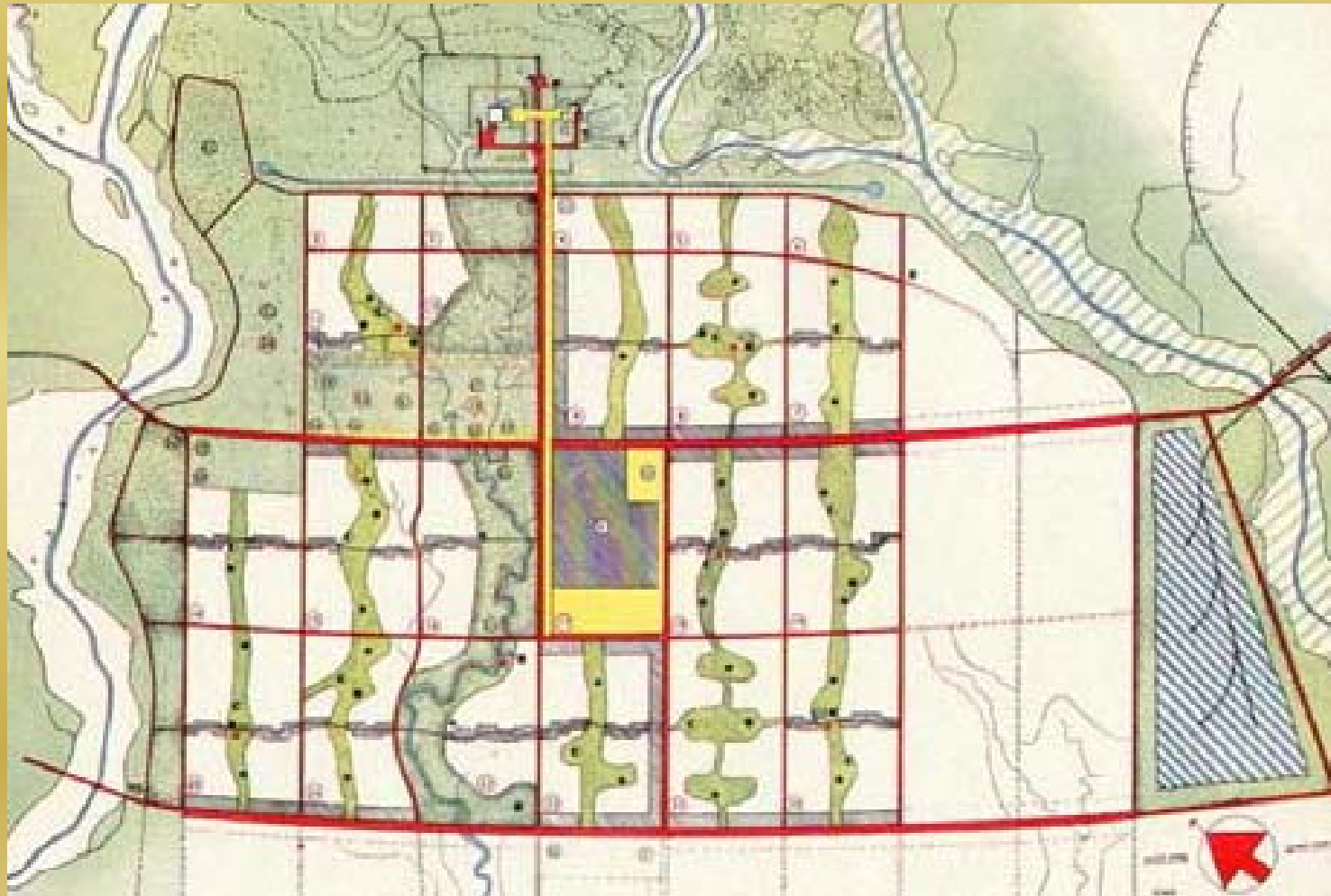
THE CAPITOL COMPLEX

- The area of the greatest symbolic significance in chandigarh was the capitol complex , which in its final form was based on the design of a graet cross axis

- The most important group of the buildings constituting the capitol- right, the parliament – left and in the background, the secretariat

- In the foreground, the pool of the palace of justice

- The artificial hills in the front of the secretariat have not been created and laid out in accordance with coebusiers conceptions

- Although the scene is harmonius in effect, there are still missing the buildings that belong here, such as , for instance, the towers of shadows

SITE PLAN

OPEN HAND

GOVERNOR,S PALACE

HIGH COURT

ASSEMBLY

SECRETARIAT

CHAND LC
CAPITOL
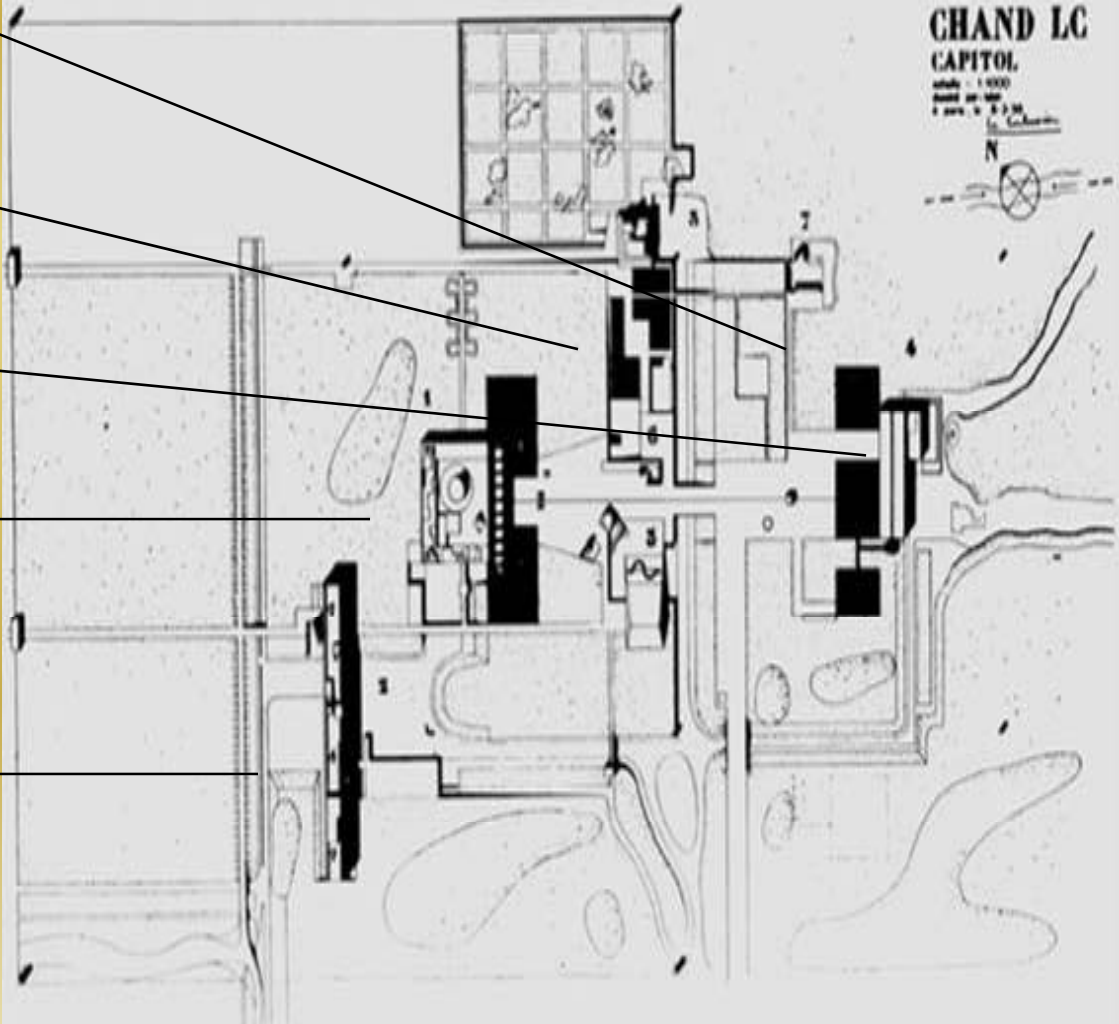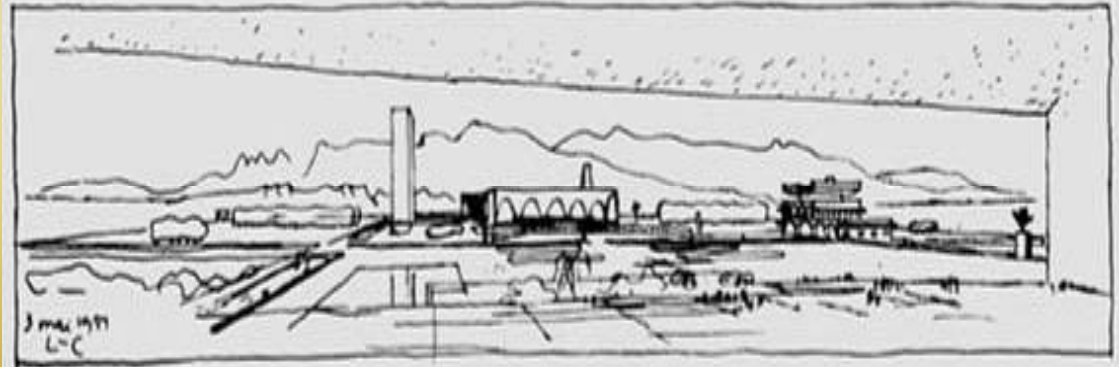
ARCHITECTURAL FEATURES

PARASOL ROOF
FORMING ARCHES

DOUBLE ROOF

GAP LEFT BETWEEN

TWO ROOFS

COLOURED MASSIVE PILLARS

FULL HT ENTRANCE

The Open Hand. This monumental sculpture (which is also seen by Le Corbusier as the outline of a bird, the sign for peace) is prominent in the landscape and is part of a sunken court for public assembly, named 'the Pit of Consideration'.
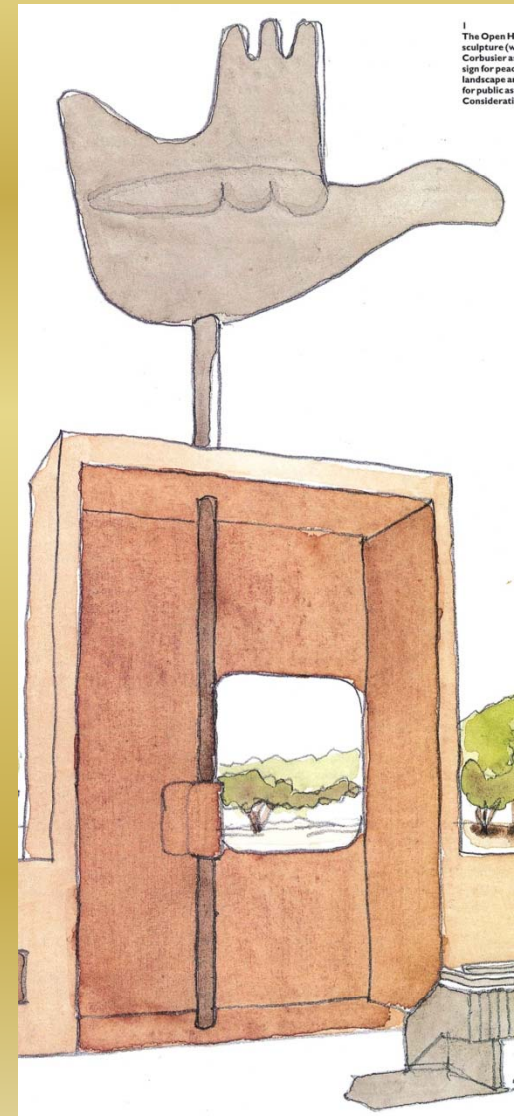
AR 0416, Town Planning & Human Settlements,

UNIT IV

ZONING AND DEVELOPMENT CONTROL

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AP(SG)/Architecture

TOPICS TO BE COVERED

- **REGIONAL PLANNING**
  - CENTRAL PLACE THEORY
- **SUBDIVISION REGULATION**
- **ZONING**

What is a "Region" ?

- **an area with certain characteristics**, often-mere size, by virtue of which it is adopted as a suitable unit for some particular purpose of business and administration.

- It is also **an area which is homogeneous in respect of some particular set of associated conditions**, whether of the land or of the people, such as industry, farming, distribution of population, commerce, or the general sphere of influence of a city.

- A region in general terms is envisaged as a natural unit, in contrast to the artificial unit created for administrative purposes.

Central Place theory

- discovered that there is some ordering principle governing the distribution of towns and cities, that is, settlements concerned with the provision of goods and services

- developed a theory regarding the gradation of towns and the degree of centralized services

WALTER CHRISTALLER
1893–1969
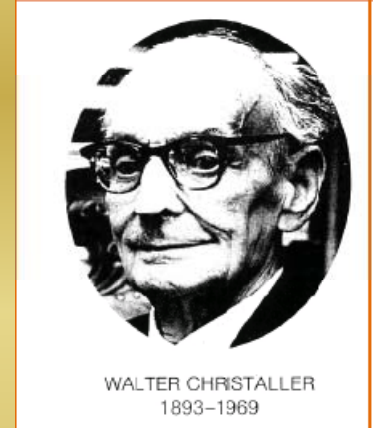
central place

- central place is defined as a settlement providing services for the population of its hinter land (known as complementary region), supplying it with central goods and services (educational, leisure and cultural facilities) as well as those of retail and wholesale trade.

Basic elements of Christaller theory are

- A central good
- A central place
- A complimentary region

- In the Central Place Theory (CPT) of Christaller, **centrality means importance. It is manifested by the quantity and quality of different services and functions provided by the settlement.**

- It is defined as the functional importance of settlement of the central place. Functions determine the centrality of the centre and not the location.

- One of the most important characteristics of a central function is that it generates spatial interactions, through the movement of men, materials and ideas between the center place and the complimentary region surrounding it. Rare the function, the higher the range of the interaction.

- Each center has its complimentary area and from the center emanates the **centrifugal or distributive functions and from the complimentary areas to the center gravitate centripetal activities or activities of collection.**

Assumptions of Central Place Theory

(1) The Landscape is even with an even distribution of natural resources and an even spread of population – invariably assumed to be farmers. "People do the marketing in a circular area".

(2) The radius of the circle of the marketing i.e. 'the extent of the market' is the function of transport cost. The circles so overlap that the common areas of overlap provide hexagonal shapes, and all consumers and area are served by various centers.

(3) Population is evenly distributed in all the directions and the movement of people in all the directions is unimpeded and involves equal unit transport cost.

(4) All people are rational: they want to minimize cost (transport cost and the time cost of traveling in particular) and maximize gains.

(5) All the consumers have the same purchasing power

(6) Lower order functions are available at lower order places and higher order functions at higher order places, though higher order settlements have many lower order functions also.

(7) The relationship between settlement nodes is orderly and not disorderly. There is a hierarchy of functions related to the hierarchy of settlements. In every field there are facilities ranging from the lowest to the highest order. (Primary school to institutes to specialize learning and research; village dispensary to specialized institutes of surgery / medical treatment; one counter bank to big banks).

(8) Each lower or higher order service requires threshold population. A cinema hall will require a minimum film–viewing public to (say) 500 members per show. A threshold population and efficiency of transport system (Low transport cost) will sustain a facility.
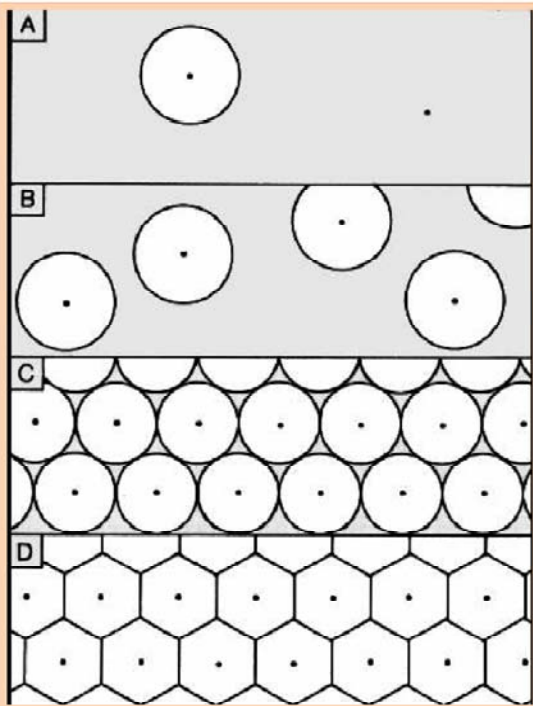
- Now let us assume a farmer selling his produce at point A as in the diagram. Other farmers are willing to travel distance 'a' to purchase from this farmer.

- Since we have assumed that travel is equally easy in all directions, the market area for the farmer at A is given by the circle with radius 'a'.

- In time more producers may develop their own separate market areas as shown in the diagram.

- With the development of transportation and communications the market areas will expand and there will be an attempt to cover the maximum possible space.

- With circular market areas we can have a situation as in the diagram

- While in the diagram there are several unserved areas (the shaded region in the figure), in the diagram there is considerable overlapping. Neither of these instances gives a stable result.

- While in the former case the unserved areas will have to be split equally between neighboring areas, in the latter consumers in the shaded region will tend to choose the nearest centre.

- Ultimately hexagonal market areas will emerge as given in the diagram. It is only this hexagonal arrangement that ensures an efficient division of space between a number of central places.

Delineation of formal regions:

- Grouping together of local units with similar characteristics according to certain clearly defined criteria, but which differ significantly from units outside the region on the basis of chosen criteria

Delineation of functional region:

- Involving grouping together of local units that display a considerable degree of interdependence.

Regional planning

- Regional planning is a category of planning and development that deals with designing and placing infrastructure and other elements across a large area.

- Regional planning zones may encompass several towns, cities or even parts of different states, each of which could have their own planning offices in the realm of "urban planning"

PLANNING REGIONS OF TAMILNADU

- Madras metropolitan region - Area covered by Chingleput District and palar basin in the north arcot district
- Vellore Region i.e. the remaining parts of the north arcot district
- South arcot region including cuddalore – neyveli lignite are and ponniar basin
- Salem region
- Coimbatore region
- Nilgiris region
- Tiruchirapalli – Thanjavur region or cauveri delta region
- Madurai region
- Tirunelveli region including kanyakumari

subdivision regulation

- Earlier in every city much land is either vacant or inefficiently used – speculative prospect

- Various methods have been proposed to emphasize taxation on land

- Necessity for regulations over the subdivision of urban land was urgent, since use and development of land constitute a right bestowed by the community upon the individual, and this right may be withdrawn if he violates the conditions

Sub division and layout

- A piece of land divided into more than 8 parcels, each of which is to be sold separately is called *Layout* ,

  whereas less than or equal to 8 divisions is called a *subdivision of land*

Many interests involved …

- To the land developer the subdividing of land is primarily a matter of profit

- To the community, it is a matter of public concern –Activities determine quality of living

- Where such activities are uncontrolled , they place burden on public treasury – excessive cost of public improvements and maintenance, increase in cost of services

Transforming city plan to reality

- Many elements in the overall plan are realized at the time the land is developed

- Highways, streets and alleys, sewer and water lines , power lines, schools, transportation lines, police and fire protection …

- The city plan is either realized or it is lost in the subdivision of land

Subdivision procedure

- Land is surveyed
- Officials records consulted – proposed highway, special easements, right of way etc.
- Amenities, cultural and social facilities
- Refer Subdivision ordinances
- Planner or engineer to prepare preliminary plan – include size, shape no of lots, location of streets, radii, drainage, utilities etc.

Subdivision procedure

- Estimate is prepared – cost of development
- Tentative map is file with local agency – approval obtained else
- Incorporate suggestion made, if any and re-submit

Zoning

- **Zoning** is a device of land use regulation used by local governments in most developed countries.

- The word is derived from the practice of designating permitted uses of land, based on mapped zones which separate one set of land uses from another.

- Theoretically, the primary purpose of zoning is to segregate uses that are thought to be incompatible.

- In practice, zoning is used to prevent new development from interfereing with existing residents or businesses and to preserve the "character" of a community.

Zoning may include regulation of the

- kinds of activities which will be acceptable on particular lots (such as open space, residential, agricultural, commercial or industrial),

- the densities at which those activities can be performed (from low-density housing such as single family homes to high-density such as high-rise apartment buildings),

- the height of buildings,

- the amount of space structures may occupy,

- the location of a building on the lot (setbacks),

- the proportions of the types of space on a lot, such as how much landscaped space, impervious surface, traffic lanes, and parking must be provided.

- Most zoning systems have a procedure for granting variances (exceptions to the zoning rules), usually because of some perceived hardship caused by the particular nature of the property in question.

- Basically, urban zones fall into one of five major categories: residential, mixed residential-commercial, commercial, industrial and special (e. g. power plants, sports complexes, airports, shopping malls etc.).

Zoning types

- Zoning codes have evolved over the years as urban planning theory has changed, legal constraints have fluctuated, and political priorities have shifted.

- The various approaches to zoning can be divided into four broad categories: *Euclidean, Performance, Incentive, and Design-based*.

Standard Euclidean

- Also known as "Building Block" zoning

- characterized by the segregation of land uses into specified geographic districts and dimensional standards stipulating limitations on the magnitude of development activity that is allowed to take place on lots within each type of district

Standard Euclidean

- Uses within each district are usually heavily prescribed to exclude other types of uses (residential districts typically disallow commercial or industrial uses).

- Some "accessory" or "conditional" uses may be allowed in order to accommodate the needs of the primary uses.

Standard Euclidean

- Dimensional standards apply to any structures built on lots within each zoning district, and typically take the form of setbacks, height limits, minimum lot sizes, lot coverage limits, and other limitations on the "building envelope"

- Euclidean zoning is utilized by some municipalities because of its relative effectiveness, ease of implementation (one set of explicit, prescriptive rules), long-established legal precedent, and familiarity to planners and design professionals.

Euclidean II Zoning

- Euclidean II Zoning uses traditional Euclidean zoning classifications (industrial, commercial, multi-family, residential, etc.) but places them in a hierarchical order "nesting" one zoning class within another similar

Euclidean II Zoning

- For example, multi-family is not only permitted in "higher order" multi-family zoning districts, but also permitted in high order commercial and industrial zoning districts as well.

- Protection of land values is maintained by stratifying the zoning districts into levels according to their location in the urban society (neighborhood, community, municipality, and region).

Performance zoning

- Also known as "effects-based planning"

- performance zoning uses performance-based or goal-oriented criteria to establish review parameters for proposed development projects in any area of a municipality.

Performance zoning

- Performance zoning often utilizes a "points-based" system whereby a property developer can apply credits toward meeting established zoning goals through selecting from a 'menu' of compliance options (some examples include: mitigation of environmental impacts, providing public amenities, building affordable housing units, etc.).

Performance zoning

- The appeal of performance zoning lies in its high level of flexibility, rationality, transparency and accountability

- performance zoning can be extremely difficult to implement and can require a high level of discretionary activity on the part of the supervising authority

Incentive zoning

- incentive zoning is intended to provide a reward-based system to encourage development that meets established urban development goals

- Typically, a base level of prescriptive limitations on development will be established and an extensive list of incentive criteria will be established for developers to adopt or not at their discretion.

- A reward scale connected to the incentive criteria provides an enticement for developers to incorporate the desired development criteria into their projects.

Incentive zoning

- Common examples include FAR (floor area ratio) bonuses for affordable housing provided on-site, and height limit bonuses for the inclusion of public amenities on-site.

- Incentive zoning allows for a high degree of flexibility, but can be complex to administer. The more a proposed development takes advantage of incentive criteria, the more closely it has to be reviewed on a discretionary basis

Form based zoning

- Form based zoning regulates not the type of land use, but the form that that land use may take. For instance, form based zoning in a dense area may insist on low setbacks, high density, and pedestrian accessibility among other things.

- Form based zoning also may specify desirable design features, however when form-based codes do not contain appropriate illustrations and diagrams, they have been criticized as being difficult to interpret

Form based zoning

- As another example, in a largely suburban single family residential area, uses such as offices, retail, or even light industrial could be permitted so long as they conformed(setback, building size, lot coverage, height, and other factors) with other existing development in the area.

UNIT V

INTRODUCTION TO HUMAN SETTLEMENTS

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TOPICS TO BE COVERED

- growth and decay of human settlements
- influence of socio-economic factors in the development of human settlements

five major phases

- Primitive non-organised human settlements (started with the evolution of man.)

- Primitive organised settlements (the period of villages - eopolis - which lasted about 10,000 years.)

- Static urban settlements or cities (polis - which lasted about 5,000-6,000 years.)

- Dynamic urban settlements (dynapolis - which lasted 200 - 400 years.)

- The universal city (ecumenopolis - which is now beginning.)

Primitive non-organised human settlements

- The communities take up a smaller area where they are agricultural, and a larger one where they are hunting and cattle-breeding communities.

- on a macro scale, they consists of a nucleus which is the built up part of the human settlement, and several parts which lead out into the open, thinning out until they disappear

Grid 4 x 4 km
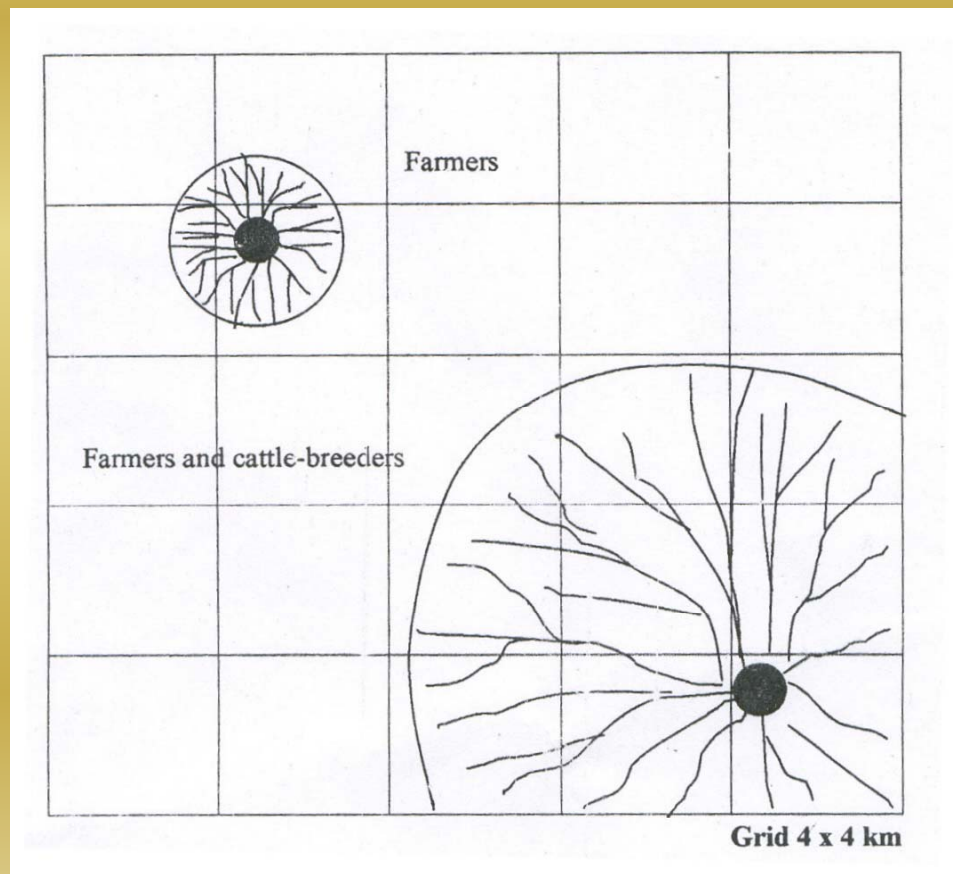
- There is no physical lines connecting this primitive settlement with others; there are no networks between settlements.

Primitive organised settlements

- era of organised agriculture, settlements also began to show some characteristics of organisation

- In initial the human had one-room dwelling in circular form, to organise the relationship of his community with other communities he expanded his dwelling by placing many round forms side by side

- Due to the loss of space between them, they developed more regular shapes with no space lost between them. The evolution reached the stage at which a rectilinear pattern develops into a regular grid - iron one.

the primitive and the grid-iron pattern
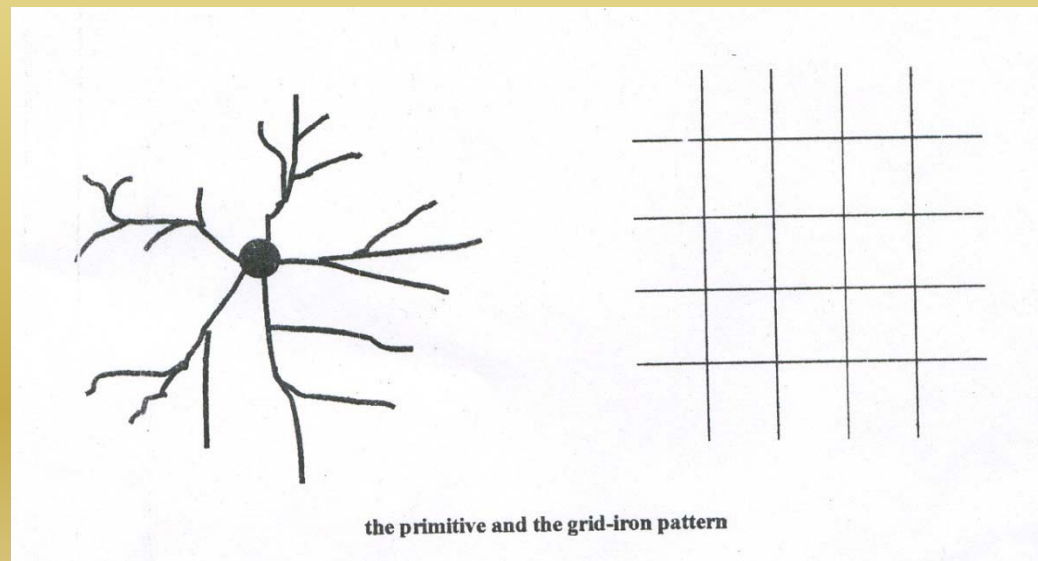
Static urban settlements

- As settlements grew in size, man came to realise that the principle of the single-nucleus was not always valid in the internal organisation of the total shells of the community, at this single nodal point, which was adequate for the village and for small cities, no longer sufficed.

- The first thing to happen was the expansion of the nucleus in one or more directions; it was no longer limited to the settlement's center of gravity.

Example: The small settlement of Priene, in ancient Greece, where the central nucleus expanded in two ways:

- first in a linear form along a main street which contained shops that would normally be clustered in the central agora
- secondly through the decentralisation of some functions, such as temples.
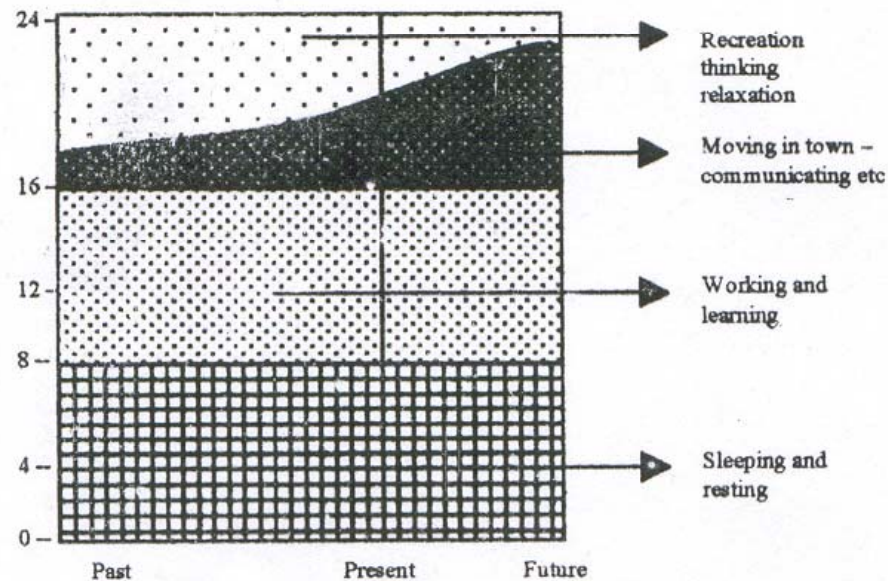
Dynamic urban settlement

- In the dynamic urban phase, settlements in space are characterised by continuous growth.

- Hence, all their problems are continuously intensified and new ones continuously created.

- Dynamic settlements, created as a result of an industrial technological revolution, multiplying in number and form, and now being created at an even higher rate.

- The evils described in them are the evils of yesterday which are being multiplied today in a very dangerous manner.

- This makes the dynamic settlement completely different from any other category of settlements and a real threat to humanity itself.

man's position is dangerous in the dynamic settlement

The use of time in a 24 hour week day by an average urban dweller

Early Dynapolis

- This is the phase when small independent human settlements with independent administrative units are beginning to grow beyond their initial boundaries.

- From the economic point of view this development is related to industrialisation, and from the technological point of view to the railroad era, which first made commuting from distance points possible.

Metropolis / Dynametropolis

- fate of the historical metropolises has been dynamic growth, a static phase, and then death

- static phase for a metropolis is the prelude of its decline and death

- dynamic metropolis, after losing its momentum for growth, becomes negatively dynamic.

Megalopolis / Dynamegalopolis

- A megalopolis has the same external characteristics as the metropolis, the only difference being that every phenomenon appears on a much larger scale.

- It is characteristic that all phenomenon of the development of human settlements up to the metropolis shown on a 100 sq.km. Scale, for megalopolis would be 1,000sq.km.

Ecumenopolis

- Regardless of whether dynamic settlements are simple (Dynapolis), or composite (metropolises and megalopolises), they have been growing continuously during the last centuries and this is apparent everywhere at present i.e. the whole Earth will be covered by one human settlement

INFLUENCE OF SOCIO-ECONOMIC FACTORS IN DEVELOPMENT OF A SETTLEMENT

Town planner needs data to base his proposals in respect of the type and number of dwelling units in a locality or a town

- population structure

- condition of existing housing

- future housing trends pertaining to various income groups

- realistic picture of the economic situation

- to think in terms of social and geographic grouping of the dwelling units while preparing the layouts, and place such amenities and services as schools, clubs, shops, places of amusement, etc., at the disposal of the community.

- The data for provision of these amenities and services on the right scale has to be supplied by the sociologist.

For a population of 1 lakh

- 15,000 telephone lines
- 1 lakh m^3 of water

It consumes per day

- 20,000 litres of milk
- 5,000 loaves of bread
- 60,000 bananas
- 10,000 kg of potato
- 7,000 kg of onion
- 12,000 kg of grain
- 3,000 kg of pulse
- 240 bars of chocolate
- 1400 bottles of cola (peak summer)

- population structure and trends is not available from the census reports. For instance, these reports do not give any idea of the accommodation in use by families, and whether the occupation of the same is voluntary or compulsory. i.e. dictated by circumstances. In the former case, people live together because they are members of a family. In the latter case they do so by force of circumstances such as economic difficulties or shortage of accommodation.

- Information on such matters is of vital importance to the planner to arrive at the volume of new housing required. If his proposals are not based on factual data, they are likely to be unrealistic and, as a rule, fall short of requirements

Demand of housing at a future date =

Existing demand + replacement need + future demand

Increase/diminution in the size of the family :

- Children grow up, get married and raise families of their own. Conversely, daughters get married and leave the parental households.

- It is difficult for the majority of households and only the affluent people can afford to find additional accommodation near their previous dwelling units. In many cases, such people shift to better but distant localities where the environment is pleasant and more congenial.

SRM

UNIVERSITY

- When towns are in the process of replanning or redevelopment, it is essential to ensure that services like schools, clinics, shops and cultural institutions are provided in proper relationship with residential accommodation.

- It is also desirable to keep the size of development within reasonable limits, because bigness lacks intimacy and social relationship among people.

- It is to avoid situations like these that the concept of the neighbourhood unit has come into existence.

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