

# Elements of Practical **GEOGRAPHY**

**R.L. Singh**

**Rana P. B. Singh**



912  
— c —

## CONTENTS

### Chapter 1

#### MAPS

Meaning and Definition, History of Maps. Types of Maps : Cadastral Maps, Topographical Maps, Walls Maps, Chorographical or Atlas Maps. Importance and Uses of Maps. Map Drawing Equipment : Drawing Table, Papers, Inks and Colours, Pencils and Pens. Tints and Patterns.

1-9

### Chapter 2

#### SCALES

Definition, Representation, Converting Scales, Design and Division of Scales, Use of Graphic Scale. Constructing Plain Scales. Comparative Scales, Different Units, Time Scales, Pace Scales, Revolution Scales, Special Types : Square Root Scales, Cube Root Scales, Scales of Verticals, Perspective Scales, Diagonal Scales, Vernier Scales, Enlargement or Reduction of Scales, Square Method, Similar Triangle Method, Instrumental Method, Pantograph, Eidograph Camera Lucida, Photostat and Photographic Methods, Combining Scales. Scales from the Length of a Degree of Latitude, Measurement of Distance, Measurement of Arcs : Square Method, Other Methods, Planimeter.

10-32

### Chapter 3

#### RELIEF DEPICTION

Elevation and Relief. Methods of Representation; Pictorial Methods—Hachures, Hill Shading, Mathematical Method—Spot Heights, Bench Marks, Trigonometrical Stations, Contours, Combination of Several Methods. Contour Features : Mountain, Hill, Massif, Knoll, Spur, Reentrant, Ridge, Plateau, Escarpment, Valley, George, Waterfall, V-shaped Valley, U-shaped Valley, Hanging Valley, Cirque, River Plain, Incised Meanders, Cliffs, Fiord coast, Ria coast, Sand dunes, Slope and Gradients. Conversion of Gradient into Angle of Slope and vice versa. Finding Slope from Contours. Profiles. Exaggeration in the Vertical Scale. Profiles along Curved Lines. Road Section. Marking routes. Intervisibility. Interpolation of Contour. Contour Representation.

33-48

### Chapter 4

#### REPRESENTING LAND-FORMS AND GEOLOGICAL STRUCTURE

Relief and Slope Analysis. Profiles. Serial Profiles. Superimposed Profiles. Projected Profiles. Composite Profiles. Slope Analysis. Smith's Relative Relief Method. Perspective Block Diagrams. One-Point Perspective. Transfer of Geological Cross-section. Trimming of the Block. Two-Point Perspective. Geological Maps; Bedding Plane Dip. Strike. Determination of Dip. Outcrop. Completion of an Outcrop on a Map. Vertical-thickness

49-82

of a bed Unconformity. Overlap. Drift Deposits. Folds. Faults. Outliers and Inliers. Method of drawing Sections. Hints for drawing the Section. Description of the Map. Representation of igneous activity on Geological Maps. Form of Rock Outputs, Width of Rock Outputs. Structure of Drainage.

### Chapter 5

#### INTERPRETATION OF TOPOGRAPHICAL MAPS

Topographical Maps of India. Conventional Signs. Hints for the scientific study of Topographical Maps : Preliminary information. Observation of the Topography. Picturing the sheet as a whole. Observing the Relief, Observing the Drainage and its Pattern. Observing the Coastal Region. Vegetation. Observing Human Settlements. Observing Means of Communication and Irrigation Study of some Selected Sheets : Mirzapur and Adjoining Regions : Introduction. Physical Feature. The Vindhyan Plateau Vegetation. Settlements. Means of Communication. Means of Irrigation and water supply. Nature of Occupation. Dun Valley, Almora and Adjoining Region. Nainital and Adjoining Region. The Skardu and the Adjoining Region. Ranchi District. Hazaribagh District. Badland Topography of the Rewa State. Gorakhpur District. Plains of West Bengal. East Bengal Plains. Orissa Coastal Region. Masulipatam and the Adjoining Region in the Kistna District. East Godavari District. Mangalore Coastal Region in the South Kanara District.

83-118

### Chapter 6

#### WEATHER MAPS

Definition. The Observations : Pressure. Wind Direction. Wind Velocity. Deflection of Winds. Temperature. Humidity Visibility. Cloudiness. Cloudform. Rainfall. Weather Symbols. Beaufort Notation. Some Weather Phenomena Defined : Hail. Snow Sleet Frost. Rime. Mist and Haze. Squall. Line Squall. Corona and Halo. Aurora Borealis. Zodiacal Light. Mirage. Isobaric Systems. Depressions or Cyclones' : Tropical Cyclones. Anticyclones. Secondary Depressions. Trough of Low Pressure. Indian Wedge. Col. Weather. Indian Weather Maps. Cold Weather Season—A Wedge of High Pressure, A Trough of Low Pressure, Anticyclone over Peninsula, Cyclone over North India. Hot Weather Season, Season of General Rains. Season of the Retreating Monsoon. Reading a Weather Map. Some Notes on the Weather Maps of India. Metric Units for Weather Reports. Cyclonic Storms—Depressions—Thunder Storms. Examples I, Pressure, Wind, Sky Condition, Precipitation, Pressure Departure from Normal. Temperature Departure from Normal, Sea-condition. Example II, Pressure, Wind, Sky Condition, Precipitation, Departure of Pressure, Departure of Temperature, Sea Condition. Weather Forecasting. Summer Monsoon. Winter Monsoon. West European Weather : Cyclone or Depression. Anticyclone.

119-160

### Chapter 7

#### REPRESENTATION OF STATISTICAL DATA

Diagrams and Diagrammatic Maps. Methods of Drawing Diagrams : Bar or Pillar or Column. Blocks. Block Piling Method. Wheel Diagrams. Pictorial Diagrams. Star Diagrams. Importance of Diagrams. Graphical Representation. Climographs. Hythergraphs. Ergographs, Band Graphs, Compound Pyramids. Superimposed

161-200

Pyramids. Cartograms. Rectangular Cartograms. Traffic Flow Cartograms. Isochronic Cartograms. Distribution Maps. General Requirements for the Construction of Distribution Maps. Methods of Drawing Distribution Maps—Colour or Tint Method. Symbol or Choroschematic Method, Isopleth Method, Shading or Choropleth Method, Dot Method, Multiple Dot Method, Diagrammatic Method. Population Maps. Some Specific Problems and Techniques for Population Mapping. Stock Maps. Crop Maps. Climatic Maps. Industrial Maps. Mineral Maps. Advantages and Limitations of Distribution Maps.

*Chapter 8*

201-225

**STATISTICAL METHODS AND TECHNIQUES**

Definition. Types of Sampling. Types of Table. Frequency Distribution. Geographical Representations of Frequency Distributions. Histograms. Measures of Location or Central Tendency. Mean of a Grouped Data. Short Cut Method for Calculation of Mean, Median, Mode, Measures of Dispersion or Variability, Absolute Measures of Variation or Dispersion, Range, Mean Absolute Deviation or Mean Deviation. Quartile Deviation. Standard Deviation. Relative Measures of Dispersion. Comparative Assessment of the Two Scales. Interpretations of Semilog Charts. Skewness Kurtosis. Time Series. The Moving Average Method. Interpolation. Scatter Diagrams, Correlation and Linear Regression. Correlation Co-efficient for Grouped Data. Regression Lines. Regression Co-efficient. Rank Correlation. Test of Significance.

*Chapter 9*

226-251

**SYSTEM ANALYSIS, MODEL BUILDING AND COMPUTERIZATION**

System Analysis Nearest Neighbour Analysis. Use of NNA in Linear Situation. Spacing in Uniform Plane. Graph-Theoretic Measures. Matrix and Graph Connectivity. Degree of Connectivity Shape Analysis. Cell Model. Model Building. Set Theoretic Approach Towards Modelling. Gravity Model. Potential Surfaces. Computerization Program Making. Procedures. Input Description. Additional Assigned Names. Programs Analysis Data. Input Listing. Program. Conclusion.

*Chapter 10*

252-309

**MAP PROJECTION**

Meaning and Use. Brief Historical Aspect. Classification of Map Projections. The Construction of Map Projections. Simple Conical Projection with One Standard Parallel. Simple Conic Projection with Two Standard Parallels. Bonne's Conical Projection. Polyconic Projection. Conical Equal Area Projection with One Standard Parallel. Lambert's Conical Equal Area Projection with One Standard Parallel. Zenithal Projection. Stereographic Polar Zenithal Projection. Gnomonic Polar Zenithal Projection. Orthographic Polar Zenithal Projection. Polar Zenithal Equal Area Projection. Polar Zenithal Equidistant Projection. Stereographic Normal Zenithal Projection. Natural Cylindrical Projection. Simple Cylindrical Projection. Cylindrical Equal Area Projection. Mercator's Projection, Sinusoidal or Sanson-Flamsteed Projection. Mollweid's Projection. Gall's Projection. The Globular Projection. International Map Projection. Choice of Projections. Summary of Typical Projections. Solution of Errors in the graticules drawn on different Map Projections—Methods of constructing comparative scales for graticules drawn on Map Projection. Methods of constructing comparative scales.

**Chapter 11****SURVEYING**

Field Notes, Chain Surveying, Importance of Chaining. Appliances—Chains, Taps, Offset Staff, Ranging Rods, Arrows Optical Square, Magnetic Compass. Procedure. Errors, Obstacles to Chaining. Plane-Table Surveying. Equipments, Procedure for a Complete the Survey. Suggestions. Sources of Errors. The Three Point Problem—Mechanical Method, Graphic Method, Trail Method. Advantages and Disadvantages of Plane Table Surveying. Company Surveying. The Prismatic Compass. Procedure Suggestions for accurate work. Plotting. Closing Error. Detection and Elimination of Local Attraction. Sources of Errors. Advantages and Disadvantages of Compass Surveying. Disadvantages of Traverse Surveying. Methods of Traversing—By Chain or Tape. By Prismatic Compass, By Plane Table, By Theodolite. Adjustment of Errors in Open Traverse. Contouring. Spirit Level. Plotting. Closing Error. Detection and Elimination of Attraction. Sources of Errors. Advantages and Disadvantages of Compass Surveying. Parts of a Transit Theodolite. Procedure. Plotting. Co-ordinate Method of Traverse Computation, Calculations. Traverse Surveying. Methods of Traversing. Adjustment of Errors in Open Traverse. Contouring. The Spirit Level. Practical Contouring Sextants, Nautical Sextant. Procedure. Basis of Large Scale Maps. Triangulation.

310-343

**Chapter 12****PHOTOGRAMMETRY AND AIR PHOTO INTERPRETATION**

Some defined terms associated with aerial Photographs and aerial Photographic Surveys. General equipment used in air photo interpretation. Parallax bar or Stereomicrometer. Aerial or Radial-Triangulation and Preparation of Miner Central Plot or Grid. Aerial Mosaic. Interpretation of Aerial Photographs. To find the number of air photos. List of conventional symbols. Dip and Strike.

344-357

**Chapter 13****MINERALS AND ROCKS**

Minerals, Characters depending upon Cohesion and Elasticity : Form, Hardness, Fracture, Cleavage, Characters depending upon Light, Specific Gravity of the Mineral, Other Minor Characters, Classification; Rock Forming Minerals. Ore Forming Minerals, Description of Minerals. Soft Minerals. Medium Soft Minerals. Medium Hard Minerals. Hard Minerals. Very Hard Minerals. Light Minerals. Medium Light Minerals. Medium Heavy Minerals. Heavy Minerals. Very Heavy Minerals. Metallic and Non-metallic Colours. Rocks—Igneous Rocks. Igneous Granite. Pegmatite. Syenite, Diorite. Gabbro. Periodolite. Dolerite. Basalt. Rhyolite. Pumice. Sedimentary Rocks. Sandstones. Shales. Lime stones. Breccia. Conglomerate. Metamorphic. Quartzite. Slates.

358-375

**Chapter 14****FIELD STUDIES & RESEARCH STEPS**

Training the student in Field Geography. Instructions for the Study of a Typical Area. Giridih and Adjoining Region. Arrangement and Equipment. Arrangement for Camping some Specific Areas. Mirzapur and the Adjoining Region. Measure the Depth of Water Table or Sub-Soil Water. Kodarma Parasnath-Jharia-Region. Jabalpur and the Adjoining Region. Setting of Map in the Field. Collection of Data in the Field. Taking the Soil Sample, Measuring the Depth of Water or Sub-soil Water. Collecting of Data regarding Social Geography. How to write the Regional Account. Problems and Patterns of field-research. Five steps of research, time-budget. Village Report : An Outline.

376-393

APPENDICES

394-421

- 1A. Use of Logarithms, 394
- 1B. Use of Units of Measurement and Conversion Tables, 395-396
2.  $\chi^2$  (Chi-square) Table, 397
3. Z value Table, 398
4.  $t$  distribution Table, 399
5. Logarithms, 400-401
6. Antilogarithms, 402-403
7. Angles, degrees and values, 404-405
8. Square roots (1—100), 406-409
9. Cube roots (1—1000), 410-415
10. Reciprocals (1—10), 416-417
11. Random sampling numbers, 418
12. Pseudo-random numbers, 419
13. Tailed  $t$  test values, 420
14.  $F$  distribution value, 421