A choropleth map uses shading or pattern fills in various areas of a map to represent the value of some variable. A map of the USA might show population density for each state with a darker or lighter shade.

An advantage is that they are very easy to understand and show spatial distributions of data quite well.

A disadvantage is that the data values are not necessarily correlated with the areas. On the USA map, some states are larger than others, and the larger states can seem to have greater value than the smaller states, simply by virtue of their size.

Advantages and disadvantages of choropleth maps

- Easy to draw
- Simple to interpret
- Give a good overall impression of the area
- They are based on averages so don't give exact figures of particular locations
- They can conceal large differences in an area

Disadvantages of Choropleth Maps

- They give a false impression of abrupt change at the boundaries of shaded units.

- It can be difficult to distinguish between different shades in the maps.

- They have terrible problems with induction (e.g.: even though not everyone voted Republican in a state, when they color it red on a map on TV it LOOKS like everyone did)

- boundaries of unit areas are arbitrary sometimes (e.g.: “the South”)

Advantages of Choropleth Maps

- It provides an easy way to visualize how a measurement varies across an area.
- When defining regions is important to a discussion (as in an election map divided by electoral regions), choropleths are preferred.
- Choropleth maps are also appropriate for indicating differences in land use, like the amount of recreational land or type of forest cover.

The data variable uses colour progression to represent itself in each region of the map. Typically, this can be a blending from one colour to another, a single hue progression, transparent to opaque, light to dark or an entire colour spectrum.

One downside to the use of colour is that you can't accurately read or compare values from the map. Another issue is that larger regions appear more emphasised then smaller ones, so the viewer's perception of the shaded values are affected.

A common error when producing Choropleth Maps is to encode raw data values (such as population) rather than using normalized values (calculating population per square kilometre for example) to produce a density map.

Choropleth Map

Description

Choropleth Maps display divided geographical areas or regions that are coloured, shaded or patterned in relation to a data variable. This provides a way to visualise values over a geographical area, which can show variation or patterns across the displayed location.

Choropleth Map. **Choropleth maps** are popular thematic **maps used** to represent statistical data through various shading patterns or symbols on predetermined geographic areas (i.e. countries). They are good at utilizing data to easily represent variability of the desired measurement, across a region.

Merits of Isopleth

1. This is a very effective method of showing distribution and variation.

2. It is ideally suited for showing climatic elements, gradient and transitional belt.

3. Isotherms, isobars and isohyets are important examples of this method.

4. Isopleths do not follow administrative boundaries and show the elements in their natural form.

Demerits of Isopleth Technique :

1. Isopleths normally show natural elements whereas data are often available according to administrative units.

2. Many isopleths are drawn by interpolation which sometimes lead to inaccuracy in the directions of isopleths and the pattern of distribution shown by those lines is distorted.

3. The isopleths lose their significance, whenever there is abrupt change in density or intensity.

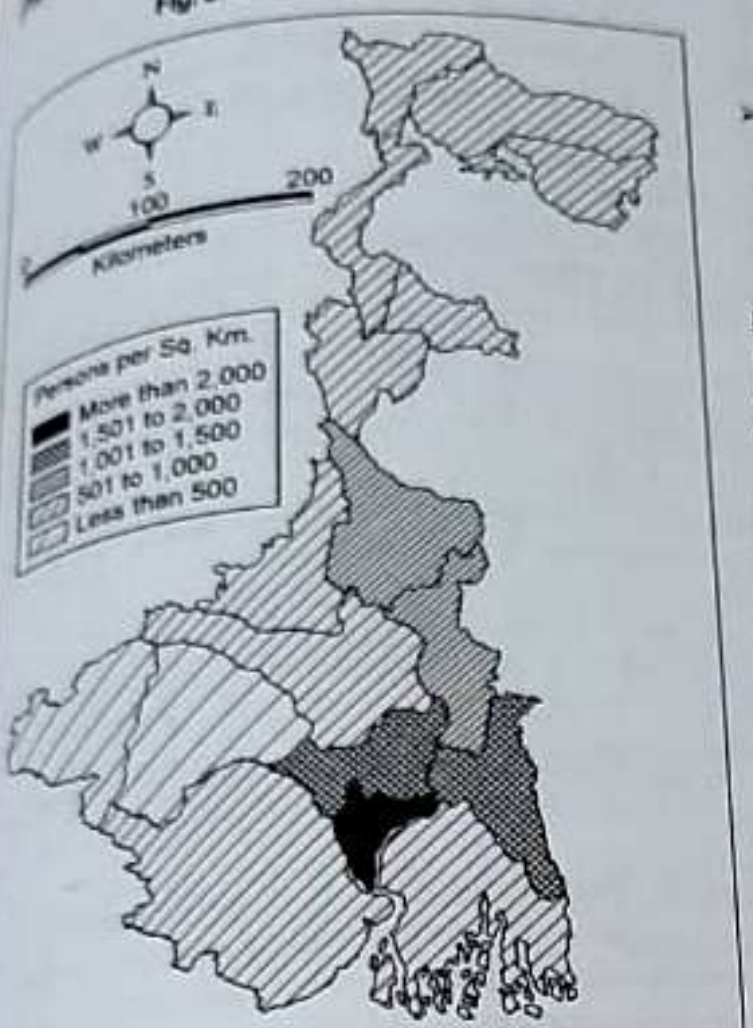
4. When transitional belts are not wide enough, these lines lose their importance.

deviation or standard deviation of the dataset or any other criteria chosen by the researcher that seems to better suit his/her purpose.

- The *third step* involves the meticulous drawing of shades (of either line or colour) following the administrative boundaries as per the choropleth table.

Choropleth maps are the basic tools of human geographers. The smaller the administrative units, the more the map precision. Intervals should be wisely chosen depending more on experience rather than on the theoretical character of distribution.

Fig. 5.49 Choropleth Map



The construction of a choropleth map is a 3-*step process* as follows:

- The *first* step is the drawing of a worksheet with four columns—name of the unit (column 1), area (column 2), absolute value of an element (column 3) and the density obtained by dividing the absolute value by the area (column 4) and rows equalling the count of the administrative units.
- The *second* step is the construction of a *choropleth table* showing the columns of the density classes, shading system, administrative units and remarks. The choice of the scale of densities may be based on arithmetical progression with uniform class interval, or geometrical progression with rapid increasing intervals, or quartile deviation or mean

a rhythmic interval basis (e.g., common intervals in arithmetic progression—2, 4, 6, 8...), (b) *geometric* (e.g., common factors in geometric progression—2, 4, 8, 16...) and (c) may be based *on natural breaks* in a frequency distribution. The *size* of the enumeration unit determines the *frequency* and *density* of evaluated points from which the isopleths are interpolated and hence the *precision*. The *shape* of the areal units determines the *location* of the plotting points. Usually areal *centres* or centroids are at first carefully marked and then isopleths are interpolated in them. The principle of interpolation is based on the assumption that *between any two points there is an uniform rate of change of values*. Hence, the isopleths are proportionally placed. Isopleth maps are effectively drawn with both the absolute and the indexed values of any kind of information that involves spatial variation. For better visual appeal inter-isopleth spaces may be filled in by graded shading and colour. In case of isometric lines, the maps are called *chorisometer maps* while in case of isopleths the maps are called *chorisopleth maps* (Wright 1944). Isopleth maps, showing spatial distribution of an element, may be prepared on different time frames for an understanding of the changes in regional pattern.

Choropleth Maps

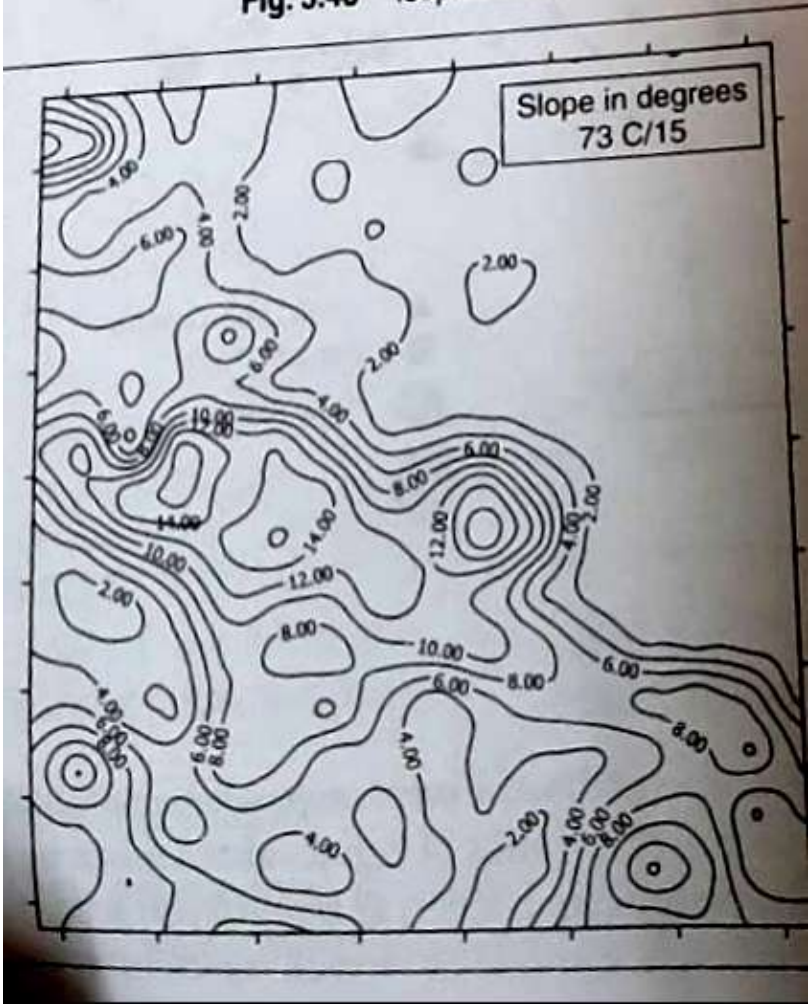
Choropleth maps are technically *quantitative areal* maps that show the spatial distribution of the intensity or density of an element with the help of a system of graded shading or colour, drawn following the boundaries of the administrative units (Fig. 5.49). The basic principle is that the *intensity of shading is directly proportional to the density of elements*. These density maps, related as they are to the administrative units, display only average distributions. Hence, the grouping of a number of units under one average value implies distributional uniformity. This may be far from the real world picture for the broad average may mask a vast range of local variations. Obviously, the more expansive the areal units, the more sweeping the generalisation presented in the map form.

isometric lines, isontic lines and isogram. Wright (1944) proposed that isograms be used for all lines of quantity with two subdivisions—*isometric lines* (metron *meaning* measurement) that represent a constant value or intensity pertaining to every point through which it passes and *isopleths* that represent a quantity or enumeration assumed to be constant, pertaining to certain areas through which it passes (Fig. 5.48).

Isopleth maps are principally *trend-surface maps* with three dimensions. The spatial trends are indicated by the *spacing* of isopleths. The *closer* the isopleths, the *sharper* the spatial variation and the *steeper* the horizontal gradient, and vice versa. Hence, regionalisation becomes easier based on the spatial geometry of the steepest zone. However, the precision of drawing of isopleths along with the resultant geometric pattern depends on the selected *value intervals*, the *size* and *shape* of the units for which statistics are available, the *situation of the plotting points* and the actual *method of interpolation* (Mackay 1953, Porter 1958).

Based on the overall range of quantities to be mapped, value intervals should be carefully selected. Intervals may be (a) *isarithmic*, i.e., on

Fig. 5.48 Isopleth Map



Isopleth Maps

These are *quantitative areal maps* where quantities are indicated by lines of equal value known by a multiplicity of such terms as *isopleth* (iso = equal, plethos = a multitude or crowd), *isarithm*, isoline,

isopleth map. ... **Isopleth maps** simplify information about a region by showing areas with continuous distribution. **Isopleth maps** may use lines to show areas where elevation, temperature, rainfall, or some other quality is the same; values between lines can be interpolated.