

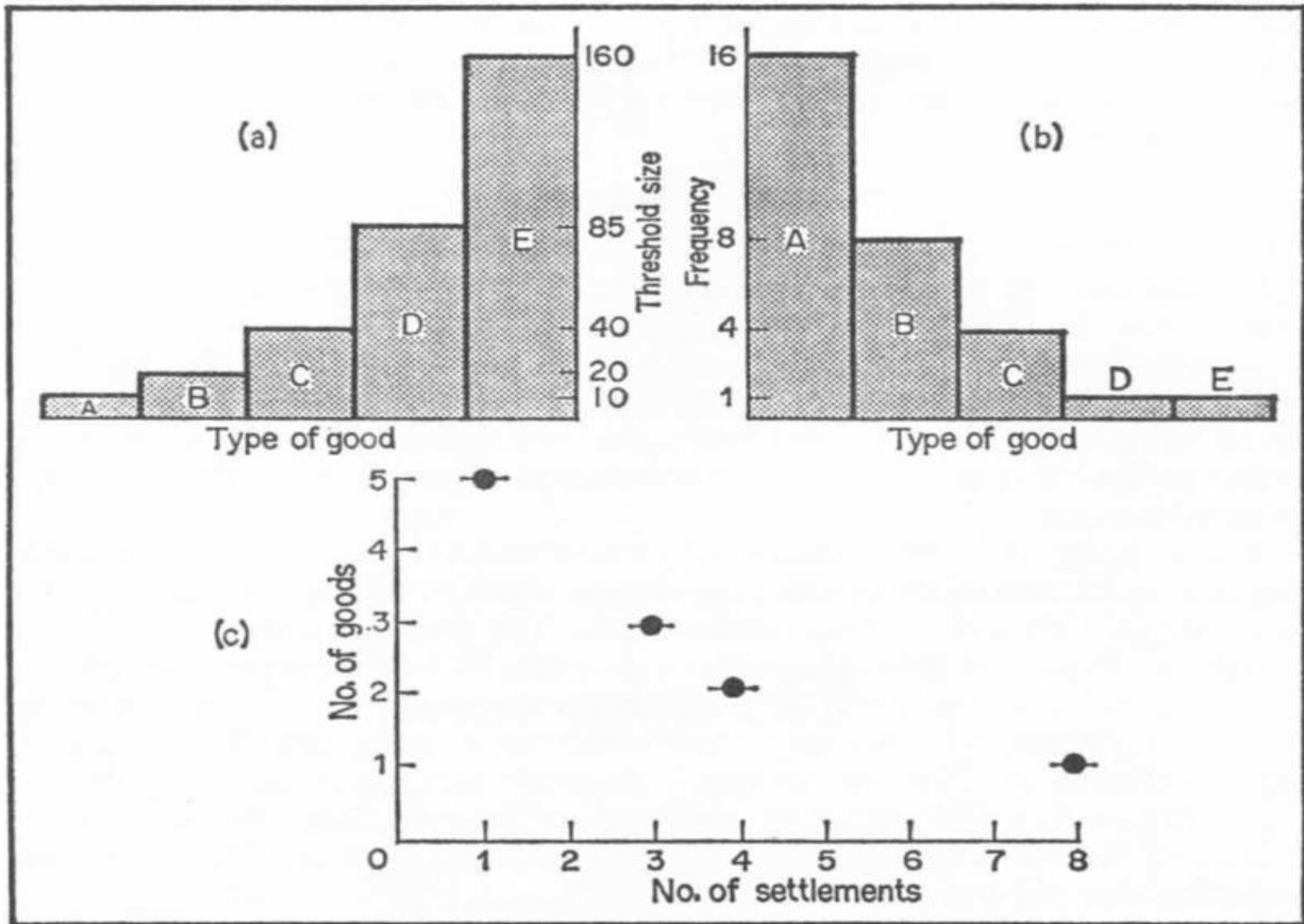
Urban Hierarchies:
Central Place Theory;
August Loch's theory of
Market Centers

Urban Hierarchies

- The concept of Urban System was introduced by Brian J.L. Berry (1964) in his noteworthy work “Cities as systems within systems of cities”. Urban places do not exist in isolation. There is a whole series of different types of relationship between separate towns and cities and we use the term urban system to indicate that the individual urban centers are linked to each other (Short 1984).
- ‘At national level cities are part of a complex system of interrelated urban places and the key elements in economic, social and political organization of regions and nations. The interdependence among towns and cities makes it important to view a country as a systems of urban place rather than as a series of independent settlements’ (Pacione 2009: 121).
- The idea of urban hierarchy is central to the concept of urban system. The urban hierarchy concept considers that the urban places vary in population sizes and economic functions. The analysis of urban hierarchy mainly relates to the ranked order of cities based on different criteria, such as population size, economic power, retail sales and number of industrial workers (Kaplan et al. 2004)

- Much discussion has centred around the question of *whether there is a gradual and continuous decrease of urban population size with descending rank, or whether there are groups of towns of decreasing but approximately equal size and importance.*
- The former situation is referred to as a **continuum** of urban sizes, the latter as an urban **hierarchy**.
- The term **central place** is used to describe a settlement providing one or more services for the population living outside it. Such services may be rudimentary but essential, such as a general store, or sophisticated and specialised, such as a university.
- When a high-order function occurs in a town it is normal to find most lower-order functions also present. It will be apparent that the population required to support different functions tends to increase as one goes higher up the hierarchy.
- The minimum number of people required to support a function or service is called the **threshold population**. If the population falls below that number or if changing taste and habits result in the existing population making less use of a service then it will cease to operate.

Urban Hierarchies



Urban Hierarchies

- Various studies have been made of the relationships between the number of services in towns and their population size. From what has been stated earlier it is to be expected that high-order centres with a wide range of services will have large populations.

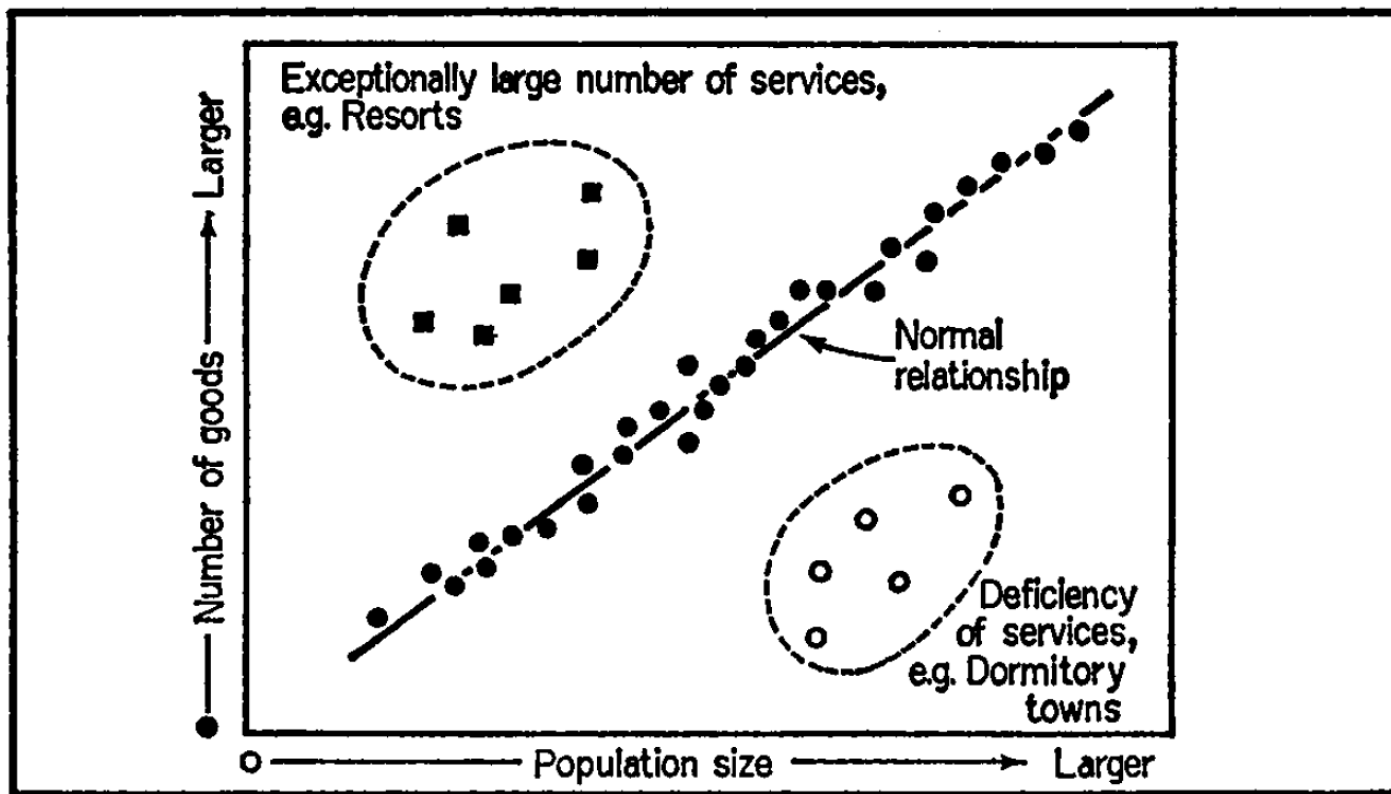


Fig. 18.3. Graph showing the relationship between population size and functional importance (after B. J. Garner).

Central Place Theory

- One of the earliest attempts to seek an understanding of the order underlying settlement spacing was that of W. Christaller in an important and influential study first published in 1933. According to Christaller the smallest centres would lie approximately 7 km apart. Centres of the next order were thought to serve three times the area and three times the population. Thus, they would be located ($\sqrt{3} \times 7$) km or 12 km apart.

Table 18.1. The Urban Hierarchy in South-West Germany

<i>Settlement form</i>	<i>Distance apart (km)</i>	<i>Population</i>	<i>Service area (km²)</i>	<i>Population</i>
Market hamlet	7	800	45	2,700
Township centre	12	1,500	135	8,100
County seat	21	3,500	400	24,000
District city	36	9,000	1,200	75,000
Small state capital	62	27,000	3,600	225,000
Provincial head capital	108	90,000	10,800	675,000
Regional capital city	186	300,000	32,400	2,025,000

Source: After W. Christaller, from E. L. Ullman, *American Journal of Sociology*, 46, 1941.

Central Place Theory

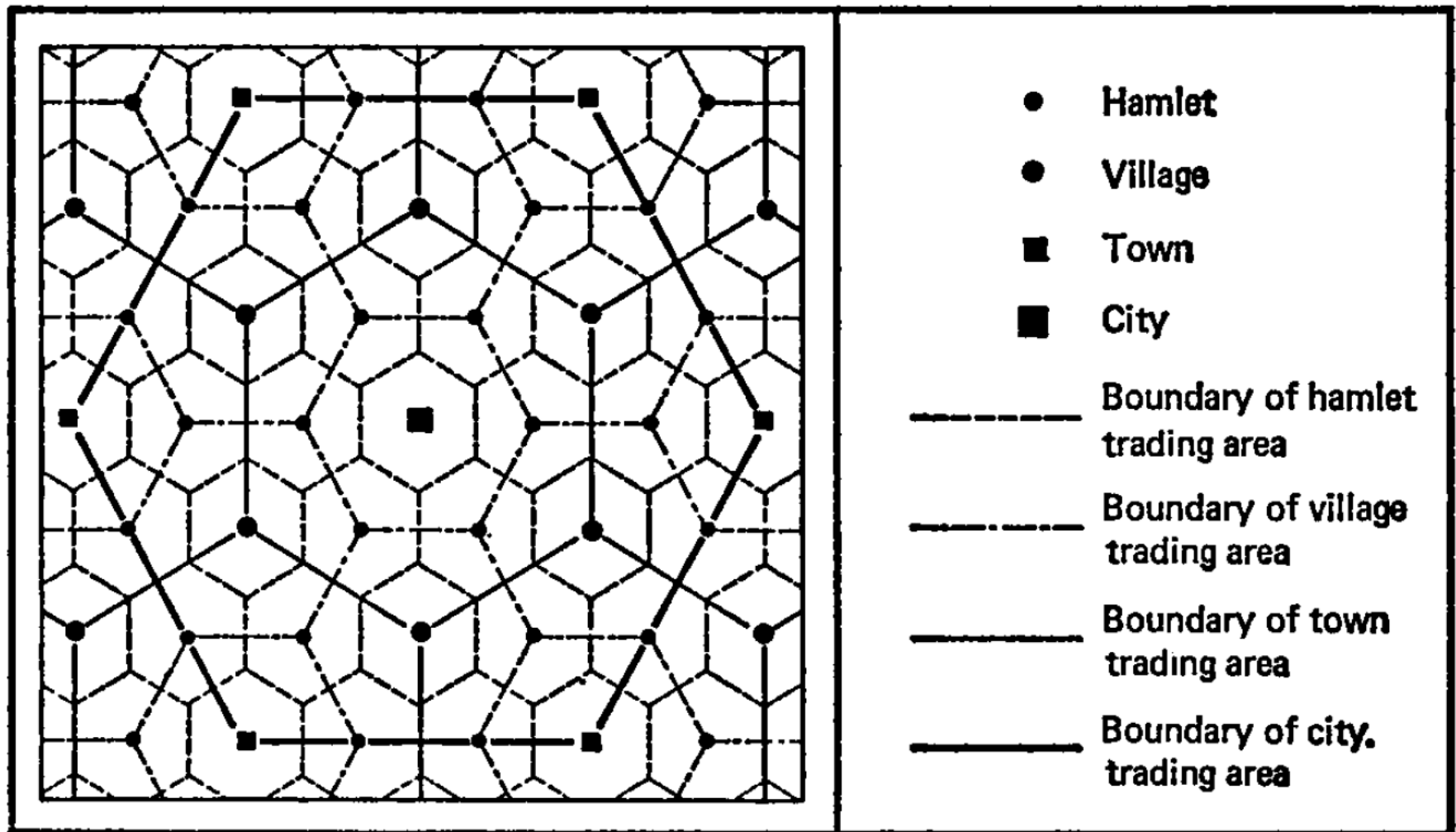


Fig. 18.4. Central place theory. Christaller's $k = 3$ network.

Central Place Theory

- Assumptions:
 - Idealised region should be thought of as being completely uniform in respect of its terrain, climate and soils and presenting equal ease and opportunities of movement in all directions—that is to say, possessing an *isotropic surface*.
 - Predominantly agricultural. Families would tend to settle in groups, and small, largely self-sufficient hamlets would be established in the landscape.
 - Since the terrain is flat and of uniform quality these hamlets would tend to be evenly distributed, say 4 km apart, each located at the apex of an equilateral triangle in order to minimise travel distances between each other.
 - population of certain hamlets will start to engage in the buying, selling and exchange of goods.

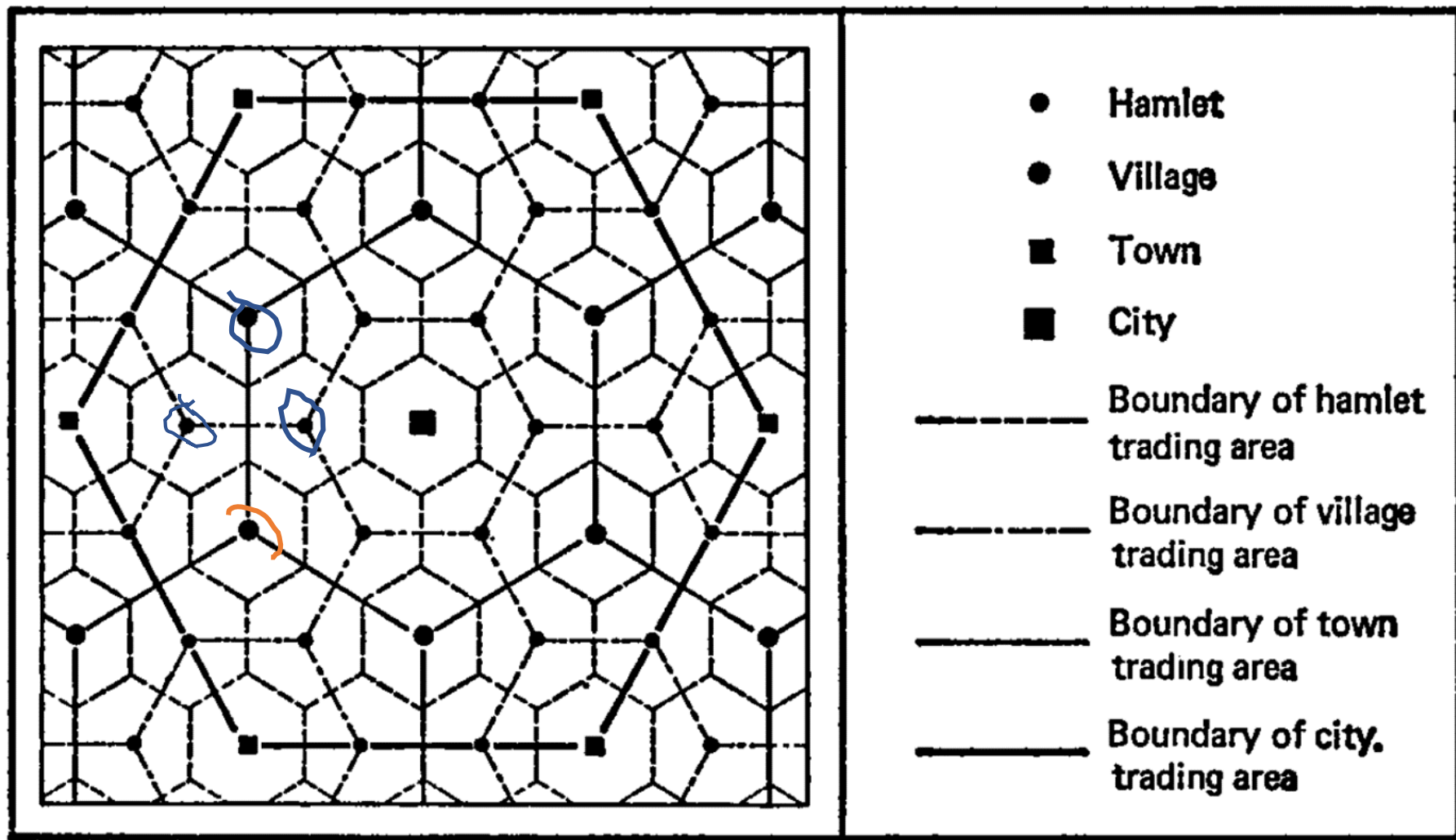


Fig. 18.4. Central place theory. Christaller's $k = 3$ network.

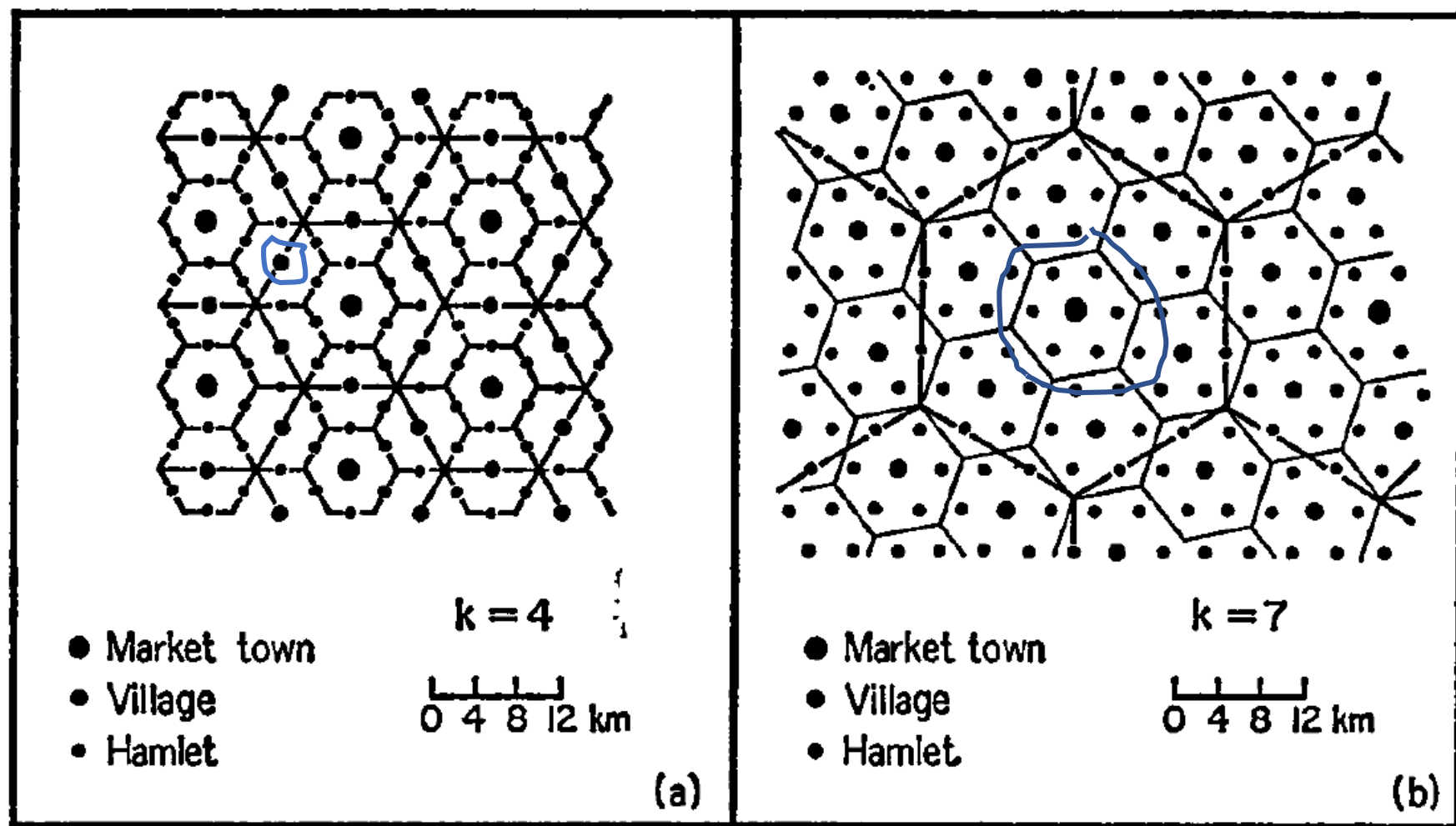


Fig. 18.6. (a) Hamlets, villages and towns in a fixed $k = 4$ hierarchy (Christaller's traffic principle). (b) Hamlets, villages and towns in a fixed $k = 7$ hierarchy (Christaller's administrative principle).

Limitations

- the assumption of the isotropic surface is never fulfilled, and therefore the theoretical arrangement of settlements in any area will inevitably be modified by local conditions.
- the model is concerned with the size and spacing of settlements supplying goods and services or providing an administrative function. It is particularly appropriate, therefore, to regions emerging from a subsistence economy in which there is a clear distinction between town and country, but in economically advanced regions, it is distorted by factors such as the presence of industrial concentrations and government policies for regional development.
- Criticism has been levelled in particular at the fixed value of Christaller's model, which, it is argued, shows a very poor approximation with reality.
- In reality the distance between hamlets would be determined by soil quality and the amount of land required to support a given population.

Market area on profit maximisation

- The first attempt to develop a general theory of location with the major emphasis on demand was made by A. Lösch in 1940. This sought to explain the size and shape of market areas within which a location would command the largest revenue.

Assumptions: Lösch simplified the world to:

- a flat uniform plain, i.e. isotropic area
- held supply constant,
- assumed that demand for a product decreased with an increase in the price.
- If this price increases, was the result of an increase in transport costs,
- demand would decrease with distance from a production centre.

Spatial Demand Cone

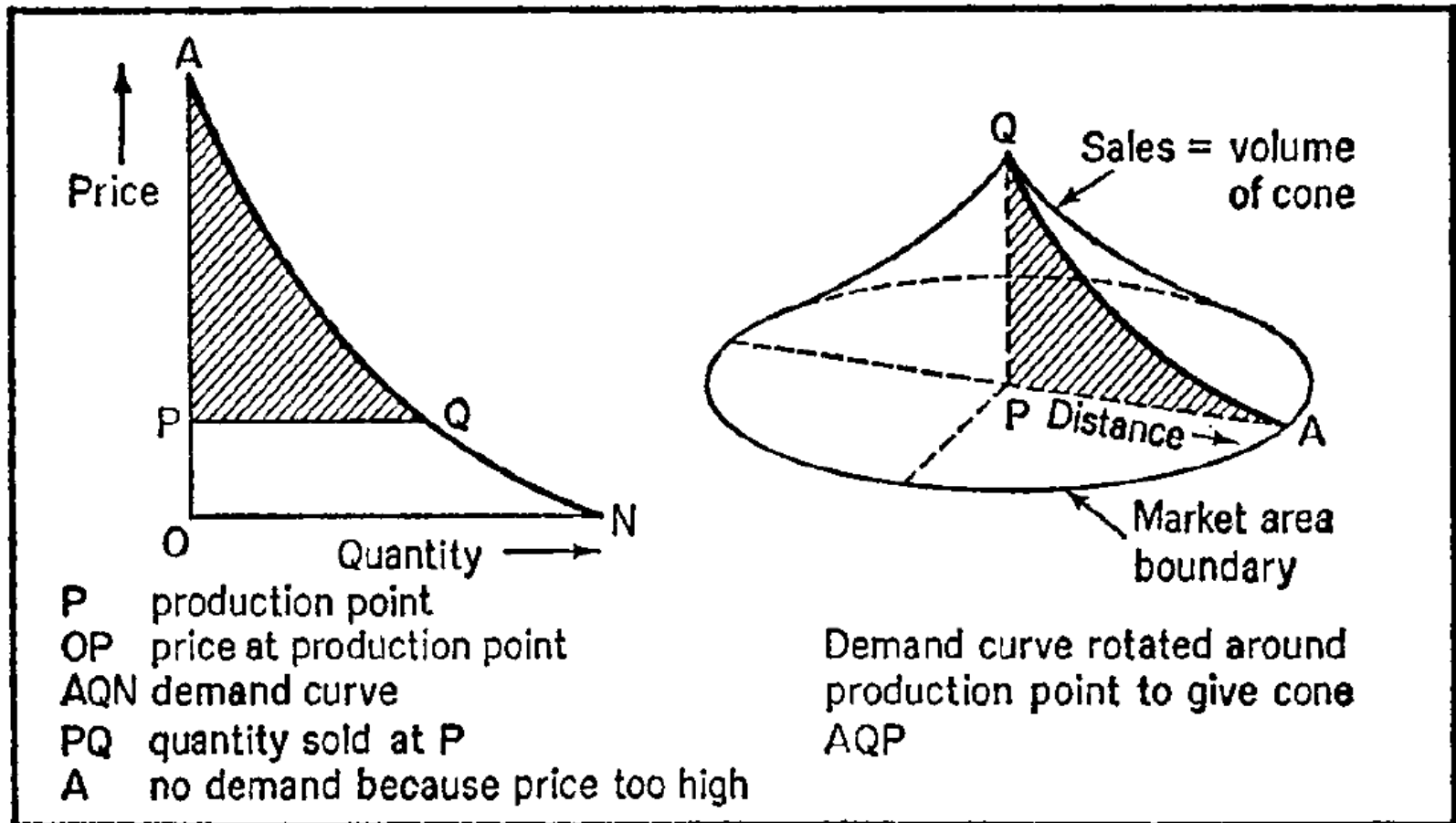
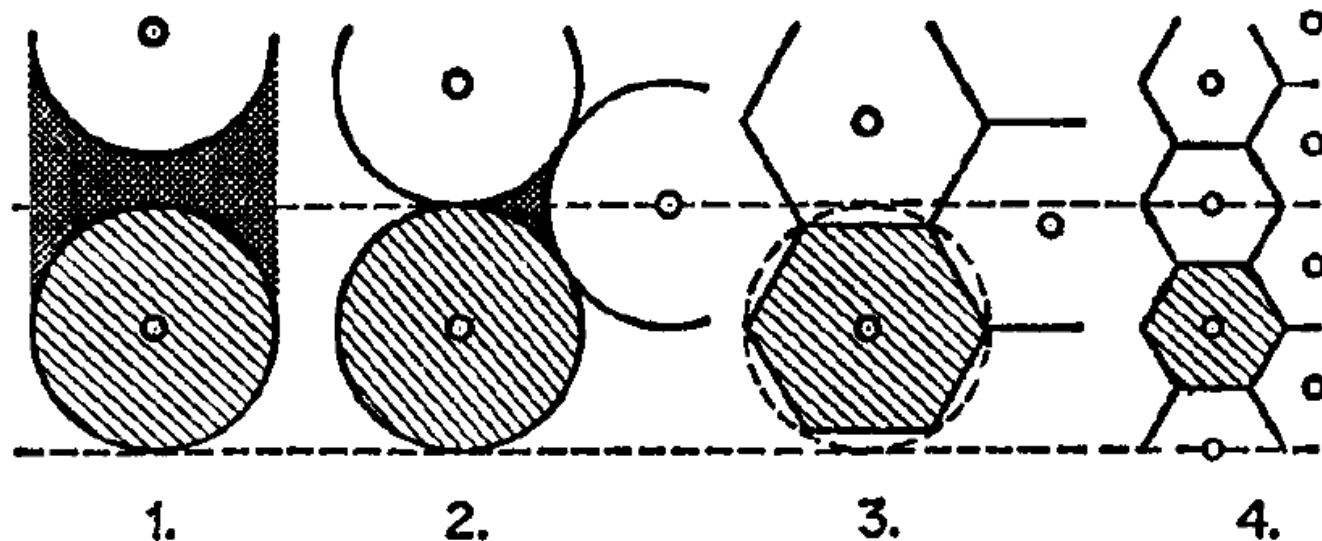


Fig. 16.6. The theoretical shape of the market area.

(from A. Lösch, *The Economics of Location*, Yale University Press, 1954)

Hexagonal Market Area



Firms operate with circular market areas.

Competition increases to serve all the potential market.

To avoid overlap of circles and to serve all areas, market areas become hexagonal.

Final pattern of market areas.

Fig. 16.7. Market areas become hexagons.

(from A. Lösch, *The Economics of Location*, Yale University Press, 1954)

Limitations

- Lösch's theory has been criticised for its abstract nature and its failure to take into account the problems arising from the locational interdependence of plants.
- Lösch was criticised for over emphasising demand
- Assumptions are criticised.

In recent years the search for maximum profit locations has been subordinated to the development of theories which accord more with the irregularities of the real world. Emphasis is now being placed on the fact that location decisions are taken by people, and the study of locational behaviour is increasing in importance.