

## CENTRAL PLACE THEORY: SIXTY YEARS ON

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### ABSTRACT

Sixty years ago, the cornerstone of retail location theory was laid down by Walter Christaller. This paper summarises the subsequent central place literature and presents a simple model of the development the theory. It contends that the concept's evolution is explicable in terms of Christaller's other, but less well known, theoretical insight, the so-called "tourist" or "resort" cycle.

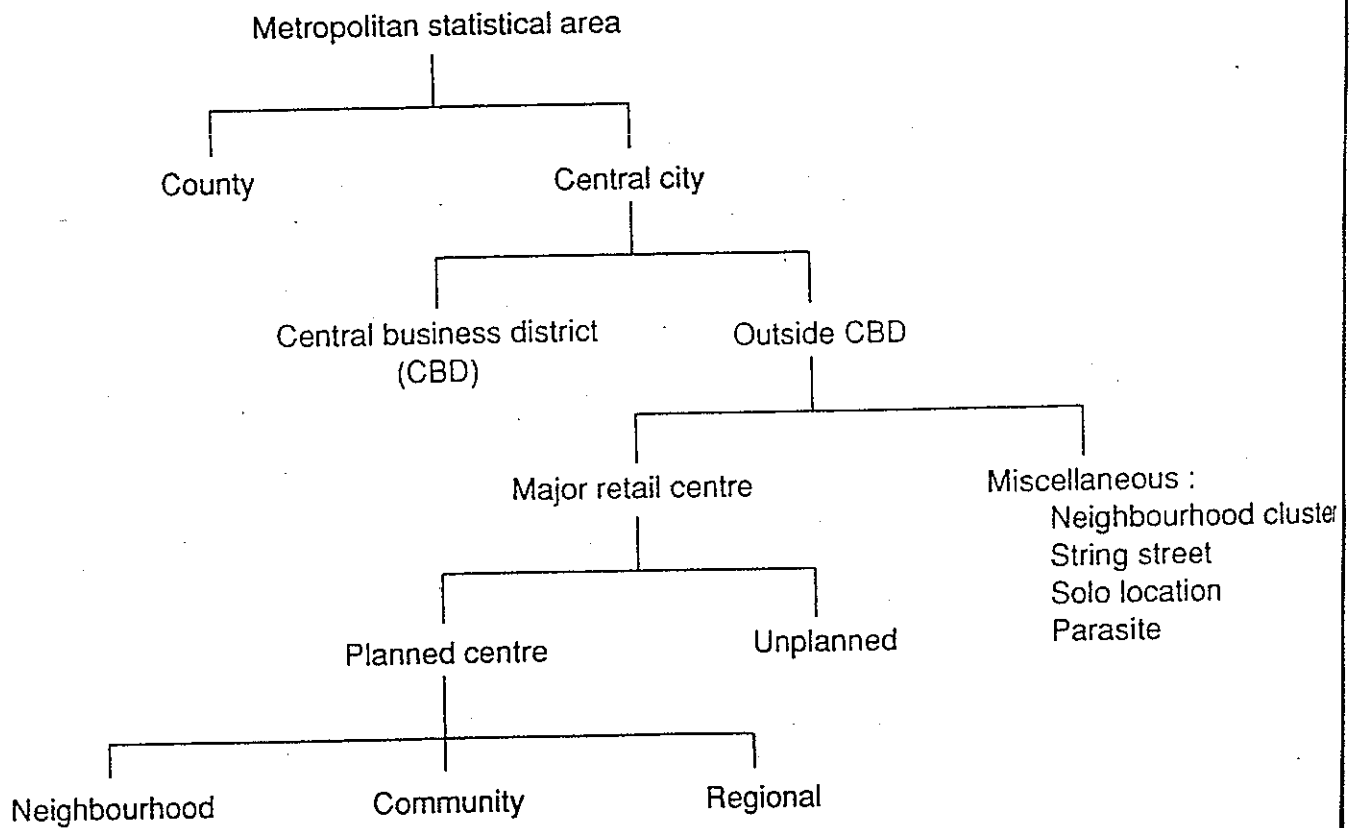
### INTRODUCTION

Sixty years ago, a momentous event occurred in the history of retail location theory. Like many momentous events, however, the momentousness of the publication of Die Zentralen Orte in Suddeutschland by Walter Christaller (1933) was not immediately apparent. Christaller's seminal study of central places in southern Germany was totally ignored at the time, and it was not until thirty years later that the significance of central place theory was appreciated (Holt-Jensen 1988). Yet today, modifications of Christaller's much-vaunted hierarchical principle are recycled in almost every introductory retailing textbook (Figure 1) and, more importantly perhaps, the concept underpins the urban planning policies of numerous countries in the developed, developing and erstwhile Communist worlds (Berry and Parr 1988). Central place theory has thus had a profound influence on the locational decision taking of retailing organisations and, according to some commentators, impeded the introduction of innovative retailing formats (Dawson 1980).

Given the importance of central place theory, it may be appropriate, in this the sixtieth anniversary of Christaller's seminal study, to attempt to examine the history of the conceptualisation. This paper, therefore, will summarise the voluminous central place literature and present a simple model of the evolution of the theory. The objective of this exercise, it must be emphasised, is not to provide an exegesis on central place principles. Such is the wealth of published material that it could not possibly be compressed into a single paper, nor, in light of the numerous extant, albeit now somewhat dated, literature reviews, is an excursus really necessary (e.g. Kivell and Shaw 1980; Potter 1982; Craig, Ghosh and McLafferty 1984). The purpose of the paper, rather, is to celebrate Christaller's legacy by noting the seminal studies of the past, highlighting some latter-day - and largely unsung - theoretical advances and setting out a simple, but somehow appropriate, model of the concept's academic progression.

Before commencing the paper proper, however, it should perhaps be pointed out that central place theory is predicated on (unfashionably) positivist principles, which presuppose, essentially, that there is an identifiable order in the material world, that people are rational, utility maximising decision makers and that economic activity takes place in a freely competitive, equilibrium seeking context. The theory, what is more, is deductively derived and normative in ethos. In other words, it is based on stated, highly simplified assumptions, not empirical observation, and thus describes a spatial patterns of retail activity that ought to occur, given the underlying assumptions, not one that necessarily does. That said, the model is by no means totally divorced from reality; on the contrary, it has spawned innumerable empirical investigations, the results of which are mixed but - depending on which commentator one consults - broadly supportive of the hypothesised patterns of activity.

**Figure 1: The Hierarchical Model of Retail Locations**



## THE TRADITIONAL MODEL

Various described as "the most innovative and most successful attempt to construct a fully realised theory of spatial structure" (Stevens 1985, p.672) and "too implausible to serve as a basis for empirical work" (Marshall 1978, p.125), central place theory is a powerful, elegant and, down the years, much maligned conceptualisation (see Beavon 1977; King 1984; Marshall 1989). As originally formulated by the geographer, Walter Christaller (1933), and thereafter by August Losch (1940), a German economist, the theory sought to describe the number, size, spacing and functional composition of retailing and service centres in a micro-economic world where there was a uniform distribution of identical, equally affluent, fully informed consumers, all of whom were served by sellers that priced f.o.b., enjoyed equivalent costs and free entry and behaved in a rational, perfectly competitive, profit maximising manner. Travel, moreover, was assumed to be uniformly priced and equally easy in all directions, consumers patronised the nearest centre that purveyed the merchandise required and a separate, single-purpose shopping trip was made for each individual item.

Under the above, admittedly improbable, assumptions, the traditional central place model predicted that, due to the increasing cost of transport, demand for any particular good would decline regularly with distance from the source of supply. Beyond a certain point demand dropped to zero and this, the distance over which consumers were prepared to travel for a specific item, was termed the market area or "range" of a good. Equally, a certain minimum level of demand must have existed before the goods were made available, though this level, the "threshold", varied from item to item. Expensive and infrequently purchased wares for which shoppers were prepared to travel long distances - such as jewellery or furniture - had higher thresholds and ranges than inexpensive, everyday purchases like groceries and meat. Provided the range exceeded the threshold and the good could thus be made available at a profit, Christaller's central place theory predicted that, in any given market, there would be a large number of purveyors of "low order" (low threshold and range) goods and relatively few sellers of "high order" (high threshold and range) merchandise (Figure 2).

In addition, as the model stipulated identical sellers, simultaneous free entry and that every customer was served, it followed that the retailers of each item would be evenly spaced in a triangular arrangement with equally sized, hexagonal market areas or hinterlands, the extent of which reflected the order of the good. When the market areas of low, high and every other order of good were subsequently superimposed, the famous hierarchy of centres ensued (Figure 3). The exact nature of this hierarchy, however, differed in the Christallerian and Loschian systems. The former was based upon the range of a good, the minimum number of suppliers and a successively inclusive assumption; in other words, that centres of a given hierarchical level not only supplied identical bundles of goods but also provided all the goods of successively lower levels. The latter, by contrast, was predicated on the threshold concept, the minimisation of profit and treated each good in isolation, though a process of rotation and superimposition attempted to reduce the number of individual centres. The net effect was a much less inflexible, albeit substantially more complex, system of central places wherein centres of a given level were neither identical nor equidistant nor indeed provided all the functions of the same and successively lower levels of the hierarchy.

## SUBSEQUENT DEVELOPMENTS

Since the pioneering insights of Christaller and Losch, the central place model has been elaborated, castigated and employed as a framework for numerous empirical studies. The major elaborations of the concept essentially involved a relaxation of the restrictive assumptions upon which it was based. The castigation stemmed, above all, from the theory's inherent lack of dynamism and its inability to accommodate the dramatic structural and organisational changes that have characterised modern retailing. And, the manifold empirical exercises have not only demonstrated that central place theory stands up - after a fashion - at the national, regional and urban scales of analysis, but they have also provided the stimulus for further modifications of the original concept.

Figure 2: Central Place Theory; Hypothetical Demand Cones

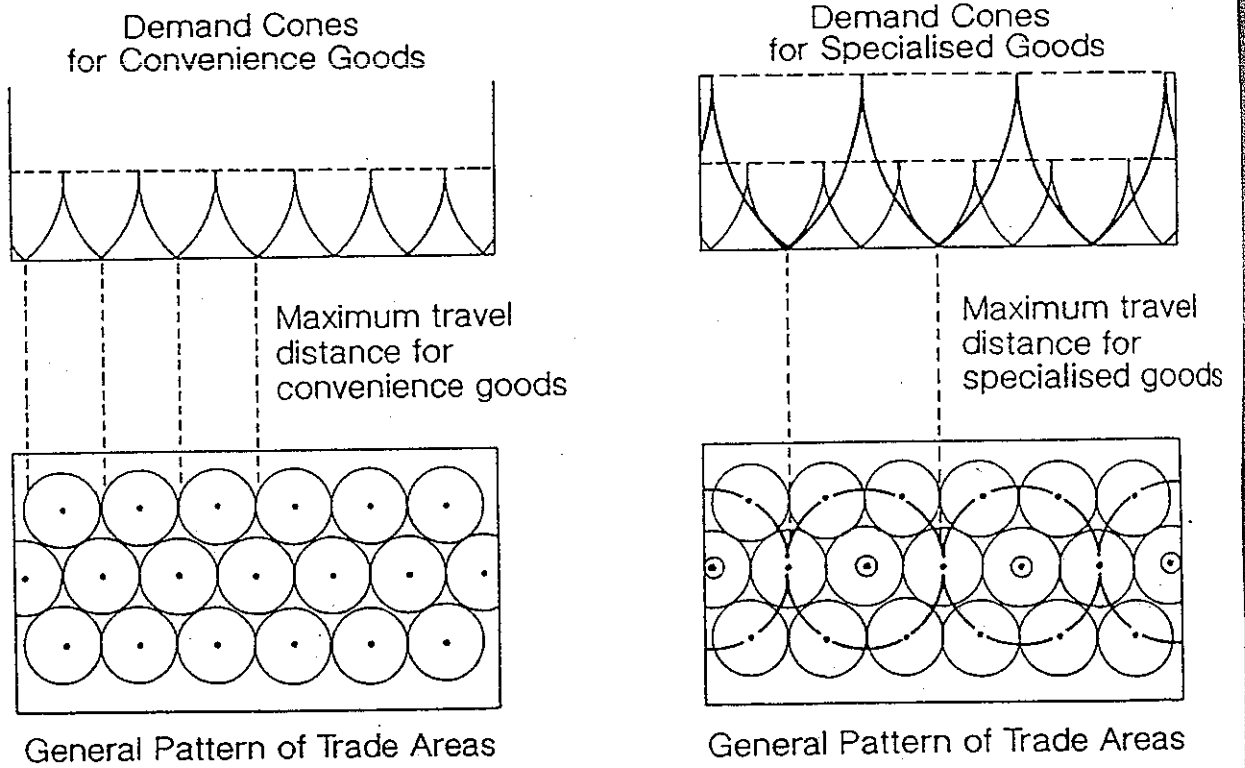
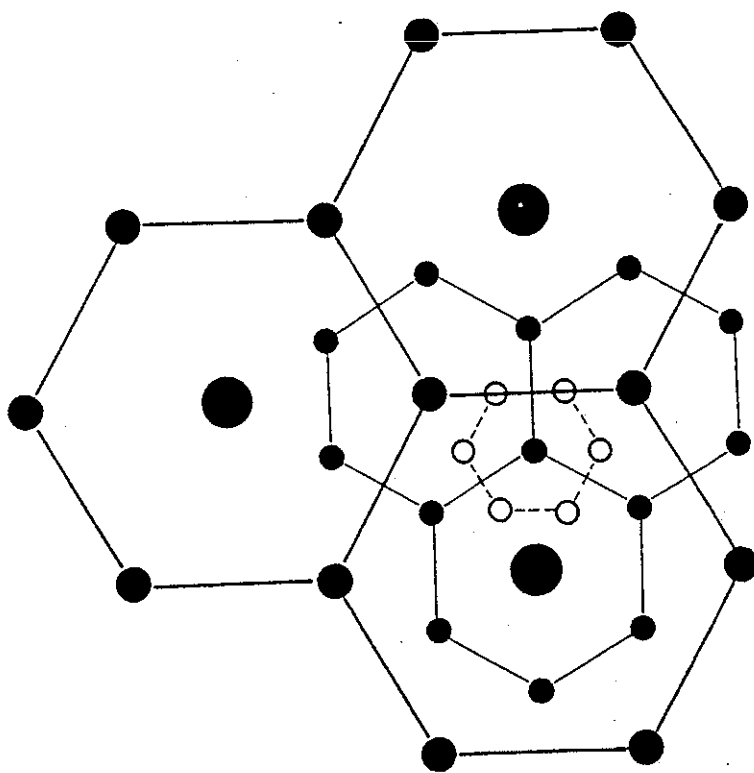


Figure 3: The Central Place Hierarchy



### Elaborations

The earliest elaborations of central place theory actually date from Christaller's original study, when he formulated his "transportation" ( $k=4$ ) and "administrative" ( $k=7$ ) principles as variants on the original profit maximising or "marketing" ( $k=3$ ) perspective. In effect, he relaxed the assumption that transportation was equally easy in all directions and that the idealised landscape was under the jurisdiction of a single legislative authority. As originally conceived, however, the  $k=4$  and  $k=7$  approaches represented alternatives to the  $k=3$  principle, though Christaller recognised that in reality a degree of interdependence might occur. This interdependence formed the basis of the celebrated "flexible  $k$ " or "general hierarchical" models of Woldenberg (1968) and Parr (1978), which, in the case of the former, allowed for the simultaneous operation of several organising principles and, in the latter case, assumed the operation of different organising principles at each tier of the hierarchy. The upshot of these adaptations was a more flexible and realistic arrangement of centres that combined the best of both the Christallerian and Loschian systems (Potter 1982).

Another significant modification of the classical model was "the theory of tertiary activity". Developed by Berry and Garrison (1958a,b), albeit predated by the "partial graphic synthesis" of Isard (1956), this adapted the hierarchical postulates of central place theory to a realistic, non-uniform world where purchasing power and population were unevenly distributed. Market areas thus expanded and centres were more widely spaced in areas of low population density or purchasing power. Conversely, market areas were more compact and centres closer together where population and purchasing power were densely concentrated, most notably in urban areas. Berry and Garrison were thus the first to apply central place principles to the internal spatial organisation of cities (though Carol (1960) staked a subsequent claim and Mayer's (1942) diagram of an idealised pattern of urban business locations was also remarkably prescient), arguing that the four tier hierarchy of rural central places - village, town, city and regional capital - was paralleled at the intra-urban scale by a four level hierarchy comprising street corner convenience cluster, neighbourhood shopping centre, community shopping centre and regional shopping centre, atop which sat the acme of the urban retailing system, the central business district.

Although the theory of tertiary activity effectively dispensed with the hexagonal market areas of the traditional model, and although the details of their methodology were subject to severe scholarly stricture (e.g. Saey 1973; Beavon 1977), Berry and Garrison's extension of central place theory into a non-uniform environment encouraged others to do likewise. Apart from the somewhat optimistic attempts to circumvent real world irregularities via map transformations (Getis 1963; Rushton 1972), variations in urban morphology (Johnston 1966; Potter 1981), contrasting modes of transport (Johnston 1968) and differences in consumer income (Davies 1972), ethnicity (Pred 1963) and socio-economic status (Garner 1966) were all introduced, albeit inductively, into the central place framework, as were national differences in the stage of economic development (Mayfield 1963; Lentnek, Leiber and Sheskin 1975). In fact, the fixed and periodic markets of the developing world have proved to be one of the most fertile theoretical and empirical test beds of central place principles (see Ghosh 1979, 1982, 1983), though the explanatory power of the concept was, as elsewhere, hotly debated (Hay 1977; Smith 1980).

Besides the assumptions of identical consumers and an even distribution of population, traditional central place theory rested on the concept of single-purpose shopping trips to the nearest centre that supplied the merchandise (though as Buursink (1981) points out Christaller made no explicit statement to this effect). A host of empirical studies, however, have demonstrated that many shopping expeditions actually involved the acquisition of several categories or orders of goods (O'Kelly 1981, 1983) and that in order to indulge in multi-purpose shopping behaviour consumers often bypassed the nearest low order centres for sellers of the same merchandise in high order centres (Clarke 1968; Day 1973; Fingleton 1975). Consequently, and contrary to the original central place model, the "nearest centre postulate" did not prevail and the ranges of similar retailing functions tended to be more extensive in higher than in lower order centres (Johnston and Rimmer 1967, Craig, Ghosh and McLafferty 1984).

Although the possibility of multi-purpose shopping was acknowledged by both Christaller and Losch, neither made any formal attempt to accommodate this type of activity within their theoretical constructs. However, this issue has been tackled with some vigour in recent years, though the analyses have varied considerably in their assumptions and approaches (e.g Bacon 1984, 1991; Thill 1985; Mulligan 1987). In some, the rate of multi-purpose shopping was imposed exogenously (Eaton and Lipsey 1982; Forster and Brummell 1984), whereas in others it was presumed to stem endogenously from the conditions of the model and the relative location of the centres (Narula, Harwitz and Lentnek 1983; Ingene and Ghosh 1990). Yet, despite these differences, it is now recognised that multi-purpose shopping behaviour has provided, for the first time, a formal rationale for the existence of a hierarchy of centres; for the presence of several outlets selling the same commodity within a single centre; and, most importantly of all, for the very fact that dissimilar retail outlets cluster together into recognisable shopping centres, both planned and unplanned (Ghosh 1986; McLafferty and Ghosh 1987).

### Castigation

If the latterday introduction of multi-purpose shopping into central place theory has proved remarkably successful, the same cannot be said for temporal considerations, or at least not with the same conviction. Despite the prolonged debate over the basic premises of the concept (the non-existence of economic man and isotropic landscapes etc.), it is generally accepted that its inability to accommodate the processes of change has been central place theory's single most significant shortcoming. As Daniels (1985, p.106) rightly pointed out, "Such a limitation is notable in so far as the theory is being applied to the behaviour of economic activities which are part of the most volatile sector in both developed and developing economies."

There have, of course, been many empirical studies of central place systems at various points in time ranging from early pre-history (Evans and Gould 1982; Bell and Church 1987) and the late middle ages (Dyer 1989) to the proto-industrial period (Sugiura 1991) and more recent past (Beaumont 1984; Stabler 1987). Several "comparative static" (Parr 1980, 1981), "process based" (White 1974, 1977, 1978) and "systems analytical" (Curry 1967; Badcock 1970) considerations of change were also undertaken, and latterday attempts to develop a dynamic model incorporating multi-purpose shopping behaviour appear to have met with some success (Kohsaka 1986; Keane 1989).

Nevertheless, the fact of the matter is that traditional central place theory was predicated upon assumptions which - attempts at relaxation notwithstanding - have become increasingly outdated in today's highly dynamic retailing environment. The rapid growth of refrigerator and automobile ownership, for example, has conspired to alter the nature and timing of consumer shopping expeditions and to loosen the geographical constraints that may have once prevailed (Rogers 1984). Similarly, the retailing system is now dominated by enormous multiple and conglomerate organisations, replete with gargantuan hypermarkets, warehouse clubs and shopping centres, and characterised by outlets with distinctive merchandise planning and marketing policies; all of which are a world away from the identical, independently owned, single line businesses of the traditional model. Most importantly perhaps, traditional central place theory was premised on the assumptions of neoclassical economics which, in Ratcliff's (1984, p.xvii) words,

views change as discontinuous, the product of disturbing elements outside the system and calling for adjustment to re-establish equilibrium or a state of quiescence...But...change is an ineluctable part of the economic process. Technology is in constant flux, institutions are forever changing, and humans continue to strive to adapt to the unending mutations in their physical and social environment...There is no present; there is only the past and the future.

Needless to say, central place theory's inherent lack of dynamics and its anachronistic assumptions have led, on the one hand, to a complete rejection of the hierarchical framework (Dawson

and Kirby 1980) and, on the other hand, to a search for alternative analogies of change. Dawson and Sparks (1986), for instance, put forward a conceptualisation based upon today's changing and increasingly segmented consumer needs and the nature of the retailing system's response to these changes. Wilson (1981, 1988) placed great faith in catastrophe theory which predicts sudden changes in the retailing system, such as from corner shop to superstore (Wilson and Oulton 1983) and from spatially dispersed to highly clustered patterns of activity (Fotheringham and Knudsen 1986). Likewise, the much-lauded advent of "chaos" theory has led to dynamic adaptations of central place principles (Arlinghaus and Arlinghaus 1989, White 1990) and yet another school of thought has contended that the manifold theories of retail institutional change - the wheel of retailing, the retail accordion, the dialectical model etc. - can be meaningfully applied to locational issues (Gibbs 1987; Kellerman 1988).

### Empirical Analyses

Although the relevance of central place theory to the dynamics of the retailing system has long been questioned, the results of the manifold empirical exercises have provided a reasonable degree of support for the existence of a retailing hierarchy, if not the postulated number, composition and hexagonal arrangement of central places (King 1984). Despite a modicum of academic disputation over the exact nature of the retailing system - some commentators considered it to be a continuum of differently sized centres, while others saw a stepped hierarchy - and not a little controversy surrounding the chosen techniques of centre classification, which ranged from complete subjectivity to multivariate analysis, the empirical record revealed that the central place conceptualisation had much to offer. After all, national and regional retailing "hierarchies" have long been and can still be discerned (Jones and Simmons 1990; Reynolds and Schiller 1992). It is well known, moreover, that the commercial structure of most western cities comprised numerous small, neighbourhood shopping districts selling low order convenience goods to local catchment areas and a limited number of large, regional scale shopping districts retailing high order comparison goods to a city wide catchment. Indeed, Warnes and Daniels (1979, 1980) concluded a detailed review of extant empirical analyses with the assertion that the spatial arrangement of shopping facilities in the majority of (European) cities was explicable in terms of central place principles. Typically this comprised a first order retailing core, a series of second order shopping districts surrounding the core, but closer to it than the edge of the city, and a greater number of shopping districts in the inner than the outer parts of the urban area. Similarly, several recent studies of individual American cities, where the traditional commercial structure has been most denuded by the process of retail decentralisation (Lord 1988), have demonstrated that the urban retail hierarchy is alive and, if not exactly well, certainly in better shape than the critics of the central place model might lead one to expect (West, von Hohenbalken and Kroner 1985; Morrill 1987; Lord and Guy 1991).

If empirical investigations of shopping district size have proved to be reasonably supportive of central place principles, the form and functional composition of metropolitan shopping areas has presented more of a problem for the traditional theory. Many modern cities, for example, contain substantive, essentially non-hierarchical, commercial concentrations - automobile row, inner city arterials, the "bright lights" area, furniture retailing districts, ethnically orientated areas and so on. Indeed, "ribbons" of retail activity have long been reported in Europe (Davies 1974), Africa (Mabogunje 1964), Australia (Clark 1967), the Middle East (Kellerman 1981) and, of course, North America (Pyle 1928). Specialised retailing agglomerations, such as automobile row (Lord 1992), the red light district (Ashworth, White and Winchester 1988), hamburger alley (Pillsbury 1987), medical centres (White 1979) and skid row (Lee 1980), have also been described in some detail.

Once again, however, these contrasts between theoretical framework and empirical reality have stimulated appropriate adjustments to the original concept. In arguably the best known reformulation, Berry (1963) posited a comprehensive, three-category typology of urban retailing locations: first, a hierarchy of planned and unplanned centres located at points of maximum accessibility within the urban system, most notably the city centre and at the intersections of ring and radial routeways; second, a number of "specialised areas", distinctive agglomerations of functionally related activities such as



automobile row, the bright lights district, medical centres, exotic markets etc.; and, third, a linear shopping or "ribbon" component that stretched along the major radial routes, albeit in a variety of guises including traditional shopping streets and highway orientated plazas (Figure 4).

Widely regarded as one of the most meaningful modifications of central place theory, Berry's framework has not been without its critics. Apart from its lack of dynamism, and its failure to accommodate supply side factors like advertising campaigns, pricing policies, variations in store image and zoning controls (Garner 1967), it has long been argued that ribbon developments and specialised areas are not separate components of the retailing system, but merely modifications of nucleated centres (Boal and Johnson 1968). The generalisability of a concept that was largely formulated within the context of a single American city (Chicago) has also been questioned (Dawson and Kirby 1980), as has the antiquity of the typology (Fairbairn 1984). The structure of urban retailing has seen enormous changes since the late '50s, though, as illustrated in Figure 5, the Berry model has been updated through the incorporation of contemporary forms of shopping development, such as hypermarkets, speciality shopping centres and off-price malls (Potter 1982; Jones 1984). Perhaps the most serious weakness of Berry's approach, however, was the fact that, in a field dominated by deductive perspectives, his typology comprised an inductively derived synthesis of central place theory, empirical analysis and the copious post-Proudfoot (1937) literature on the nature and characteristics of urban retailing.

### The Theoretical Cycle

Although he is irrevocably associated with central place theory, Walter Christaller made another important, if less well known, conceptual contribution. Exactly thirty years after his seminal study of central places in southern Germany and five years before his death, Christaller (1963) posited a cyclical model of the evolution of tourist areas and holiday destinations. He contended, in effect, that after an unspoilt area's discovery by the selected few (artists in the main), it succeeded in attracting the less select many (the mass tourist market). This very process of development, however, denuded the original attraction of the locality and thereafter it falls from favour and into a state of decline. Rediscovery, of course, is not impossible, though it invariably occurs in a somewhat different or modified form (e.g. Atlantic City's renaissance as a gambling resort).

Christaller's "tourist cycle", as it was subsequently termed, has only generated a fraction of the academic attention devoted to central place theory. Yet, when the process described by the model is examined, it bears a striking resemblance to the development of the central place concept itself. Therefore it may be appropriate - another thirty years on - attempting to examine the extent to which "theory" can successfully be transplanted for "tourist" in the evolution of Christaller's better known insight.

As is the case with so many conceptual innovations, Walter Christaller did not "discover" central place theory as such. The model, as Dawson (1969) and Muller-Wille (1978) have convincingly demonstrated, has extensive antecedents ranging from the insights of Schluter, Hettner and Lalanne in the nineteenth century to the urban planning principles postulated by Cantillon in the eighteenth and Botero in the seventeenth centuries respectively. Nevertheless, it was Christaller who synthesised "these disjointed ideas...into a logical framework" (Dawson 1969, p.448), though his timing proved to be somewhat awry. In many ways the archetypal prophet without honour in his own land, Christaller's deductively derived insights ran counter to the inductive approach to urban systems that held sway in pre-war Germany. August Losch (1940), admittedly, commented favourably on his "admirable monograph" and Christaller himself was never in any doubt about the significance of his accomplishment, modestly placing it on a par with von Thunen's agricultural model and Weber's theory of industrial location, yet his work had very little impact at the time. In fact, Walter Christaller never actually held a university teaching position.

The "development" of central place theory took place, not in Germany, but in the United States

Figure 4: Berry's Typology of Urban Retailing

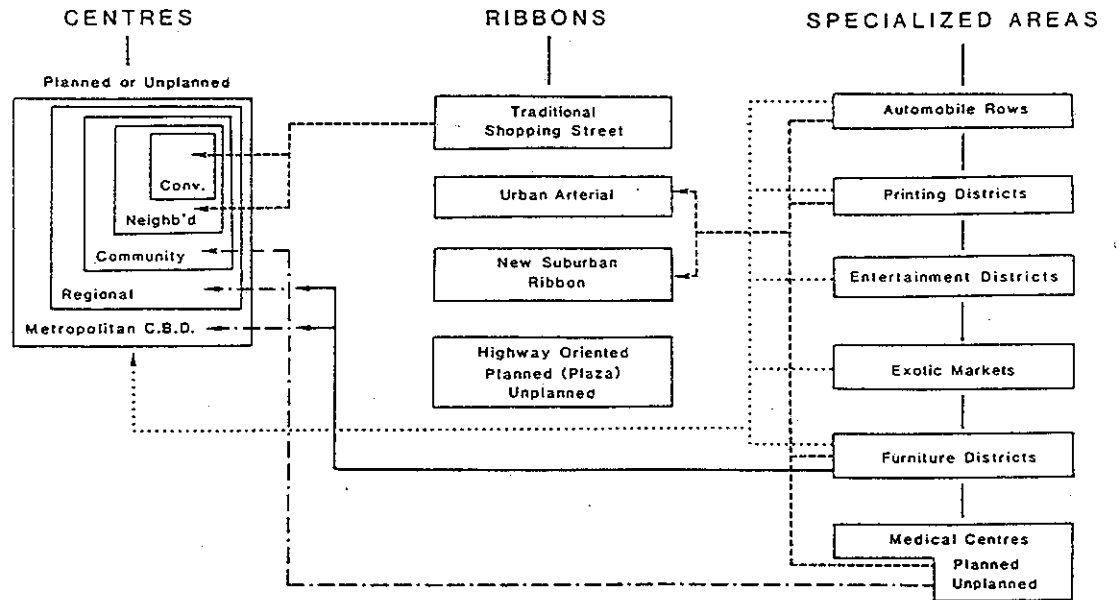
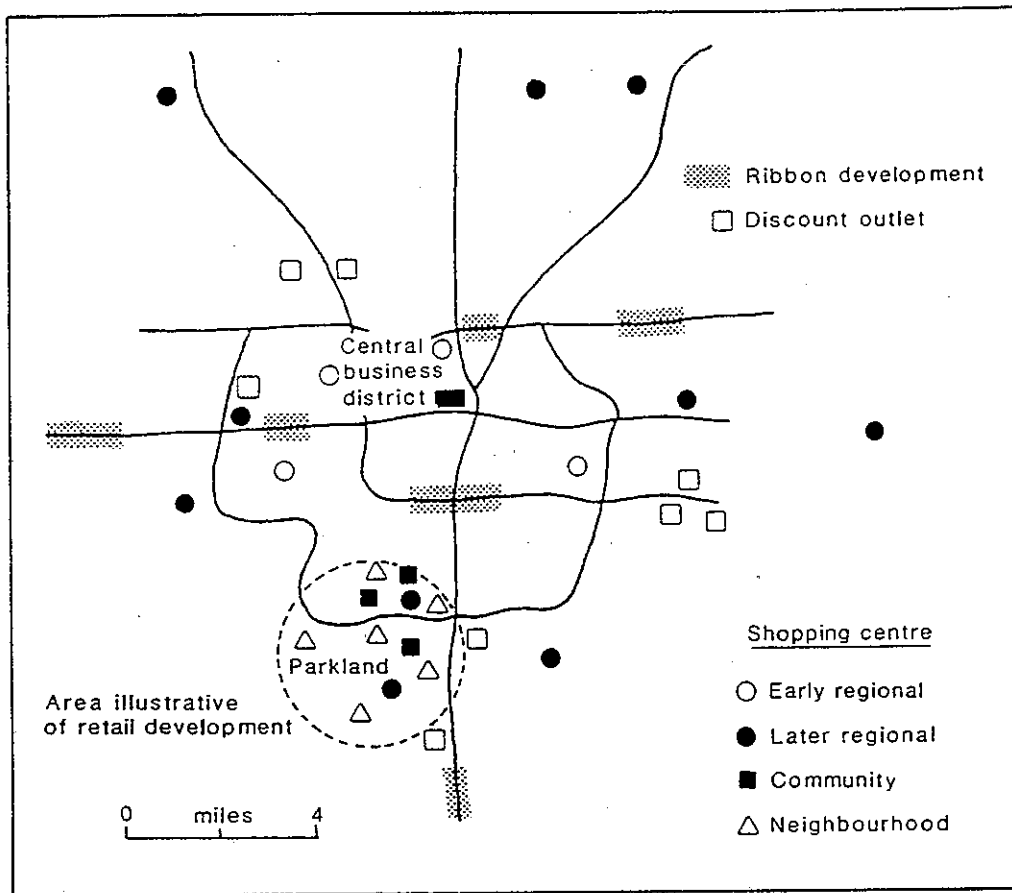


Figure 5: Post-Berry Representation of US Urban Retail Structure



of the early post-war period, when "positivism", "social physics" and "spatial science" were in the academic ascendent. Brush's (1953) application of the concept to the settlement pattern of south-western Wisconsin triggered a flood of empirical analyses and conceptual refinements which culminated in Berry's (1967) best selling locational textbook, Geography of Market Centres and Retail Distribution. Set against this, however, the results of the empirical exercises were somewhat mixed; the conceptual adaptations undermined the elegance and simplicity of the original model and, most importantly perhaps, the intellectual and socio-economic climate of the times changed irrevocably. As a consequence of rapid changes in the structure of the retailing industry, such as the growth of multiple retailing organisations, hypermarkets, shopping centres and other large scale retailing formats, and the behavioural outcome of growing automobile and refrigerator ownership, the assumptions upon which central place theory was predicated were exposed as increasingly inadequate and anachronistic. Furthermore, the counter-cultural movements of the late 1960s, early 1970s and the accompanying denunciation of the authority, aspirations, assumptions and artifacts of the "establishment", effectively undermined the legitimacy of positivist philosophies of (social) science (Hunt 1991). Thus seemingly denuded of epistemological and empirical legitimacy, central place theory fell rapidly from favour. So rapidly indeed, that by the early 1980s Carter (1981, p.139) could conclude that "very little research now takes the theory as its major theme".

If proof were needed that central place theory is currently in the "decline" stage of its theoretical cycle, one need look no further than the recent acknowledgement by Berry (1992) that the concept is now deeply unfashionable. Yet, as noted earlier, recent years have seen a number of (unheralded) modifications of the original model - such as the introduction of multi-purpose shopping behaviour etc. - which have resolved many of its long-standing shortcomings. The retail hierarchy, what is more, is still discernible despite the dramatic latterday changes in the structure and organisation of the retailing industry. There is also growing talk, whispered as yet, of an emerging anti-postmodern, post-anti-positivist intellectual milieu (e.g. Norris 1992; Gellner 1992). Thus sixty years after it was laid down by Walter Christaller, the renaissance of central place theory remains a very real possibility, though the form that this revival will take is as yet unclear.

## CONCLUSION

Once described as "geography's finest intellectual product" (Bunge 1962, p.129), central place theory has had a profound influence upon the locational decision taking of retail organisations. It has also generated a considerable amount of academic research and not a little controversy. This paper has examined the development of the central place concept in the sixty years since Christaller's seminal study, noting the major theoretical modifications, areas of disputation and the outcome of the manifold empirical investigations. By adapting Christaller's own "tourist cycle" to the evolution of the theory, it was argued that the concept's current unfashionability may well be temporary and that a new era of central place studies is about to dawn.

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