

Chapter 12

The Two Cultures of Planning

12.1 Introduction

Cities and planning are intimately related; so much so that the notion ‘planning’ is commonly employed as shorthand to the more longer term ‘urban and regional planning’ (which is not the case with economic or social planning, for instance). A possible reason for this is that cities were always regarded as signs and symbols for the existence of strong central authority capable of planned action – in antiquity, walls, roads, canals, castles, fortresses, temples and the like, indicated a central authority that is capable of planning. The same holds true for today’s cities: their roads, pavements, highways, public institutions, civil centers, industrial zones and residential areas are often seen as the result of a dominant central authority that plans and controls the city.

Cities, as we’ve seen above, are similar to languages – both are artifacts and both are dual complex systems. What distinguishes cities from languages is, firstly, the fact that they are stand-alone artifacts and secondly, *planning*: unlike languages, cities are full of planning – each urban agent is a planner at a certain scale.

In Chapter 1, I described the study of cities in the last 60 years in terms of a conjunction between Snow’s (1964) thesis about *The Two Cultures* (of science) and Kuhn’s thesis about *The Structure of Scientific Revolutions* (Kuhn 1962); that is, as a pendulum that is moving between two poles that roughly correspond to Snow’s two cultures when the moves from one pole to the other take the form of what Kuhn has termed “paradigm shifts” and what students of complexity call *phase transition*. At one pole, we see scholars that approach the city from the perspective of the sciences with their scientific methods, attempting to develop a *science of cities*, while at the other, studies that approach cities from the perspective of the humanities and social philosophy with hermeneutics as their major methodological tool.

The central thesis in Chaps. 1 and 11 is that complexity theory has the potential to bridge this gap. In Chaps. 1 and 11 the emphasis was on cities; in the present chapter the emphasis is on planning – urban, regional and environmental planning. More specifically, in what follows I show that similarly to cities the history of planning can be interpreted in terms of Snow’s two cultures (Sect. 12.2). Next I explore the current and potential relations between complexity theory and planning

(Sect. 12.3). Finally, I explicate hitherto implicit links between complexity theories and social theory oriented urbanism and planning (Sect. 12.4). The chapter concludes with a suggestion to reformulate planning theory.

12.2 The Planning Pendulum

12.2.1 *Utopian Planning – The First Hermeneutic Culture of Planning*

Similarly to cities, one can describe the history of planning in terms of a pendulum that is moving between two poles that correspond to Snow's two cultures: a qualitative descriptive *study* of city/urban/regional/environmental planning, versus a quantitative analytic *science* of (city/urban/regional/environmental) planning or *regional science* as it is often called. In the first half of the 20th century the domain of planning was dominated by the hermeneutic-descriptive culture of planning. Peter Hall (1975/2002) has described the style of planning during these years as *utopian planning*. By that he meant that influential planners such as Howard and Corbusier directed their energies to produce future visions, i.e. utopias, of cities. The notion of 'utopia' often comes with a negative connotation (specifically in Marxist thought) as something unrealistic; yet this was not the case with utopian planning. Some of its utopias, such as the 'garden city' or the concept of 'green belt' became rather influential and have shaped the form and structure of 20th century cities.

12.2.2 *The 'Rational Comprehensive' as the First Scientific Culture of Planning*

As just noted, the first quantitative-analytic-scientific culture of cities has developed in the 1950s and 1960s. Hand in hand with this development emerged also the "rational comprehensive" culture of planning, when the division of labor between the two is in line with Faludi's distinction between *theory in planning* and *theory of planning* (Faludi 1973a, b). The science of cities was to supply the theory in planning with an insight about the development and structure of the city and the way it should scientifically and rationally be, whereas 'the rational comprehensive' was the favorable theory of planning, that is, the planning procedure which will enable to plan and implement the good city in an efficient and rational way.

As illustrated in some detail by Camhis (1979), the rational comprehensive planning theory and practice was an attempt to apply the so-called *scientific method* to the domain of planning. At the basis of both was the positivist mechanistic logical-deductive scientific method. During the 1950s and 1960s planning has been transformed from intellectual-humanistic and somewhat utopian endeavor into a

formal scientific university discipline that similarly to other such disciplines (engineering, economics . . .) produces researchers, theoreticians as well as practitioners. As with the first scientific culture of cities so with the scientific culture of planning, by the late 1960s and early 1970s came the disillusionment from both the first scientific culture of cities and its associated first scientific culture of planning. In *Self-Organization and the City* (Portugali 2000) we've referred to this process of disillusionment as the "first planning dilemma" and described it in the following words:

it became evident that "rational comprehensive planning" . . . is an irrational assumption, that planning is a political, incremental . . . and essentially 'nonscientific' and nontechnical process; it became apparent that . . . [the] spectacular scientific instruments we've developed fail to tame the city, the metropolis, the megalopolis, the environment. . . . that beautiful scientific instruments such as the gravity, interaction, or entropy maximization models . . . can hardly scratch the complexity of the urban scenario, and that so are the 'rent bid curves' of . . . urban land use theory, and the 'factorial ecology' of Chicago's 'urban ecology' and the 'location triangle' of . . . industrial location theory, and the hexagonal geometrical landscapes of . . . 'central place theory'. All this scientifico – mathematical arsenal seemed "incapable of saying anything of depth and profundity about [the real problem of society and] . . . when we do say something, it appears trite and rather indecorous (ibid pp 225–6).

In retrospect it can be observed that the doubts about the rationality of the rational comprehensive started already in the late 1950s and early 1960s – during the high days of the first science of planning – when students of planning such as Lindblom (1959) or Davidoff (1965) started to criticize or at least question the approach. Theirs, however, was a "constructive criticism from within"; the aim of Lindblom with his *incremental planning* and Davidoff's with his *advocacy planning* was not to altogether reject the *raison d'être* of the rational-comprehensive approach to planning but rather to correct and improve it. Thus, Lindblom added to the rational comprehensive a politically more realistic twist, while Davidoff a more democratic one. It is therefore not surprising that their papers appeared as chapters in Faludi's (1973a) *A Reader in Planning Theory* – Lindblom in Part II entitled "Toward a comprehensive planning" while Davidoff in Part IV on "Bureaucrats, advocates, innovators". The all out attack on the first science of planning came at a later stage, in the early 1970s, when scholars such as David Harvey and Manuel Castells started to criticize it from a Structuralist-Marxist standpoint while others from a phenomenological-idealistic standpoint. Unlike Lindblom's and Davidoff's criticisms, they criticized its very foundations.

12.2.3 SMH Planning as the Second Hermeneutic Culture of Planning

The above disillusionment from the first science of cities and planning was one of the forces behind the "qualitative revolution" of the early 1970s that took place in the domains of urban studies, urban geography and urban and regional planning; a revolution that was dominated by social theory oriented approaches in particular by

structuralist-Marxist and humanistic (SMH) critical views on urbanism and planning (above Chap. 3; Portugali 2000). Two lines of thought emerged out of the SMH approaches with respect to a ‘theory of the city’ and a ‘planning theory of the city’. One was the humanistic approach whose central message was *awareness*: humanistic studies of cities, so it was believed, will expose the significance of cities to the subjectivity and individuality of people, will distinguish between *place and placelessness* (Relph 1976), between humane and . . . nonhumane cities . . . The cumulative effect of this discourse about the qualitative aspects of cities and landscapes will eventually enter the awareness planners and architects when they are practically working in and on cities.

The Marxist-structuralist stand was to altogether reject the distinction between theory of planning and theory in planning as ideological (false consciousness), with the implication that both the rational comprehensive planning theory and the above naive humanistic stand, are but part of the superstructure – integral element in the overall socio-spatial structure of the modern capitalistic city. Any genuine change in planning is thus conditioned by a total transformation – a revolution – in the structure of society. Despite their good will, claimed Marxist critics, the planners are structurally doomed to play into the hands of the politicians, the ruling classes and the multi-nationals that control *the system*.

No one can deny the important contribution of the SMH criticism of planning and the deep insight gained by the SMH approaches. On the other hand, however, it entailed a dilemma, as it was not accompanied by any practical suggestion to the practice of planning. In *Self-Organization and the City* we’ve termed this situation the second planning dilemma and described it as follows (Portugali, *ibid* pp 226–7):

. . . what are you to do with the SMH insight when as a planner you have to make a decision about urban renewal, or road networks; what would you say? start talking about base and superstructure? The labor-process? how this beautiful theoretical insight becomes praxis? Gradually it became evident that SMH planning discourse and research is remote from reality and social relevance even more than positivism. Thus, since the mid-80s, we hear once again the very same question: “how can we account . . .”; but this time not only for the coexistence of great scientific achievements, on the one hand, and the failure to apply them to society, on the other hand, but also “how can we account for the failure of the alternatives.

12.2.4 The Catch of the Kitsch

The result was a kind of a split in the domain of planning by which the practice of planning is dominated by the rational comprehensive approach while the theory of, and discourse on, planning by SMH planning approaches. This general state of dissonance between theory and practice and the inability of modernist SMH planning approaches to practically guide action, was one of the grounds upon which the postmodern view of cities and planning originated. As with postmodernism in general, so with respect to urbanism and planning, postmodern urbanism and planning have transformed the above dissonance and disillusionment from modernist ideologists, to an ideological platform as elaborated in Chap. 3 above.

On the face of it the new vision of postmodernism sounds highly desirable and creative: an ever-changing reality, ever changing and ever moving city. However, the reality of the postmodern condition shows that there is a catch here – *the catch of the kitsch*: The most prominent example is in architecture and the urban landscape: Indeed the postmodern city started with free and creative quotations from the ancient past and from futurist visions, but very quickly it turned into a uniform style – into a kind of neo-conservatism – into the very opposite of what postmodernism advocated for. This dissonance between the decided intentions and the daily praxis forms the deadlock of the postmodernist city of the 1990s and the first aspect of what we have described (Portugali *ibid*) as the third planning dilemma:

You can't tame, plan, engineer, the environment, since you are trapped in its chaos, and you cannot participate in its chaotic play since you are trapped in its structure, fashion and style.

Planning in Crisis? is a recent book by Schonwandt (2008) in which he responds to the title of his book in the affirmative, suggesting that urban planning and design are in crisis as a consequence of a growing gap between theory and practice – very similar to what we've referred to above as the three planning dilemmas.

12.3 Planning and the New Urban Reality

While postmodernism had an immediate effect on architecture and urban design, its impact on city and urban planning started to be felt at a later stage when postmodernism was interpreted as a phenomenon of late capitalism associated with technological changes, on the one hand, and the social, economic and political processes of globalization, glocalization, the decline of the welfare state and the rise of civil society, on the other. Of specific influence here were the studies of authors such as David Harvey (1989) *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, or Castells (1996) *The Rise of the Network Society*.

These interpretations acted as an impetus to the emergence of several responses of social theory derived (SMH and PPD) planning approaches of which *communicative planning* (Healey 2007) is probably the most influential one. The latter together with other approaches, which are not specifically related to the SMH-PPD culture, such as *strategic planning*, the notion of *governance* and *New Urbanism*, currently dominate the discourse in the domain of planning. While the first three respond mainly to social changes of the last decades (globalization, civil society, . . .) and are thus more related to the process of planning and planning policies, New Urbanism is more related to urban design and architecture and the physical structure of cities.

12.3.1 The Collaborative Planning Approach

The communicative, or collaborative, planning approach (CPA) can be seen as an attempt to respond to the challenges of the 'postmodern planning condition', which

is planning in the reality of globalization, the weakening of the welfare state, privatization, the rising power of the various institutions of civil society, the fragmentation of society, the consequent emergence of multicultural societies and of course of the rising dominance of urbanism and cities. Its basic premise is that in this new postmodern reality, the old, centralized, top-down, rational comprehensive planning procedures simply collapse. Instead, planning is seen as a “governance activity occurring in a complex and dynamic institutional environments, shaped by wider economic, social and environmental forces that structure, but do not determine, specific interactions” (Healey 2003, p 104). Based on Habermas’ notion of *communicative action* that refers to society at large, the communicative approach suggests a spatial/urban planning process in which the interaction and discourse between the various governmental and nongovernmental actors in the planning field function as the main regulator. Rephrasing Habermas’ statement that “. . . reaching agreement [between the various social actors is the] mechanism for coordinating action” in society (Habermas 1990, p 184), proponents of the CPA suggest that “. . . reaching agreement [between the various planning actors should become the] mechanism for coordinating action in the field of urban planning’.

The CPA has recently been presented in a book by Innes and Booher (2010) entitled *Planning with Complexity: An introduction to collaborative rationality for public policy*. Innes and Booher present the CPA as a new *collaborative rationality* that is tuned with the new planning reality of the 21st century and as such must replace the old anachronistic rational comprehensive planning approach. The basics of collaborative rationality, write Innes and Booher (ibid p 6) “have to do with the process of deliberation”:

A process is collaboratively rational to the extent that all the affected interests jointly engaged in face to face dialogue, bringing their various perspectives to the table . . . all participants must also be fully informed and able to express their views . . . Techniques must be used to mutually assure the legitimacy, comprehensibility, sincerity and accuracy of what they say. Nothing can be off the table. They have to seek consensus. (ibid).

12.3.2 Strategic Urban Planning (SUP)

The notion *strategy* and with it the distinction between *strategy* and *tactics* goes back to Sun Tzu – the 6th century B.C. famous Chinese author of *The Art of War*, to Niccolò di Bernardo dei Machiavelli and his book *The Prince* published in 1532, and to Carl von Clausewitz and his book *On War* first published in 1832, to name a few famous “founding fathers”. The modern usage of the notion of strategy is associated with Jon Boyd, still in the domain of war, and with Henry Mintzberg (1944) who applied the notion to planning in the domain of business. From here the way was short to what nowadays is termed SUP – *strategic urban planning*. According to Healey (2007) we need to distinguish between the “old” strategic planning that was dominant in the 1960s and lost its influence from the 1970s onwards, and the new strategic planning that similarly to communicative planning

emerged as a response to the new urban reality of the last two decades. This view is in line with the “American-European . . . strategic planning” conference that took place in Barcelona in 1993. The central motive of SUP as emerging in this conference is a synergy between three sectors that in the last two decades seem to have been dominating Western society: the public-sector, the private-sector and the new *third sector* which is also called *civil society*.

In a recent paper entitled “The shift from master planning to strategic planning”, Burgess and Carmona (2009) add a fourth player to the above three – the “knowledge industry” composed as it is by universities, research centers, and high-tech industries. Burgess and Carmona use the notion of “master planning” as a reference to the nature of planning in the 2nd half of the 20th century. The latter according to them was dominated by the “triumph of the Keynesian mixed economy model in capitalist societies” (ibid 23), and the modernist welfare state and its interventionist style of planning and design. The move from master planning to strategic planning is thus a move away from planning in the context of the welfare state with its Keynesian mixed economy toward planning in the context of neoliberalism and the global economy.

Burgess and Carmona’s is the opening paper in a book on *Planning Through Projects: Moving from Master Planning to Strategic Planning* (Carmona et al. 2009). As can be seen, their paper explicates to the subtitle of the book. They use the subtitle in order to emphasize the difference between the old and the new, but in fact their title does the opposite – it emphasizes the similarities between the “new” strategic planning and the “old” master planning: during the 20th century the master plan was essentially an advisory document with no legal status (compared to land use/development plan the aim of which was to control development). Similarly to the old master plan, the new strategic plan is essentially an advisory document that emphasizes long-term “urban vision” and leaves the actual decisions and actions at the hand of the two strongest players in the planning game – the political and the market forces.

12.3.3 On the Conjunction Between Collaborative Planning and SUP

As can be seen, SUP and the collaborative planning approach and rationality are intimately interrelated: the first determines the city’s strategies, whereas the second the process of their determination. More specifically, the city’s strategic plan according to this view is determined by means of a collaborative planning process the major agents of which are representatives of the three sectors: the public, the private and the third sector composed as it is of the various nonprofit and/or nongovernmental organizations.

Strategies and tactics are commonly derived from the overall or global goal of the organization. For example, in the domain of warfare the overall goal might be preventing or winning the war, whereas in business, profit making or at least economic survival. However, unlike the domains of warfare and business where the global goal of the organization can be clearly defined, in the domain of cities the

global goal is often unclear or at best a matter of debate. To overcome this difficulty proponents of SUP have suggested the notion of *vision* that is commonly used in strategic planning; in the case of cities this becomes the *urban vision*: this is the future state of the city as envisioned by the various planning actors involved in the strategic planning process. And who are these actors? In the past, these were the representatives of the first sector only; today, at the age of the postmodern condition, these are the three sectors: the public, the private and the third sector.

The basic assumption of the conjunctive communicative-strategic planning is that the more planning actors from the various sectors are involved, the more democratic and just the planning outcome will be. This is of course the bright side of the process. The dark side is that the more planning actors are involved in the process, harder to achieve becomes the communicative planning goal of reaching consensus; as a consequence, when it is reached, the outcome is a rather vague urban vision.

But this is not the end of the sequence: at the end, the vision and the strategies are meant to guide the city's administration with its executing bodies in their practical planning actions. But here is a catch: vague urban visions allow a wide spectrum of interpretations and that freedom of interpretation is given to the city's administration and its executing bodies. The result is a paradox by which a process that was meant to be democratic gives rise to its very negation, namely, a city administration that can practically do (almost) whatever it wants. Given the dependence of the first (political) sector on the capital of the second sector this situation invites corruption.

12.3.4 Governance

The term 'Governance' is derived from the Greek word 'kybernan' and 'kybernetes'. It means '*to steer and to pilot or be at the helm of things*'. While the term 'government' indicates a political unit for the function of policy making as distinguished from the administration of policies, the word 'governance' denotes an overall responsibility for both – the political and administrative functions. The notion of governance is of specific relevance to the new urban reality in which several of the actors involved in governing the city come from what we've defined as civil society. The notion of governance thus comes to emphasize the difference between the elected urban government and the processes of governing the city as described above, for instance.

12.3.5 New Urbanism

If the urban vision of specific cities is a central element of the strategic urban planning process, then *new urbanism* (NU) can be seen as a new urban vision related to cities of the late 20th and early 21st centuries at large. Unlike CPA and

SUP that referred to the processes of planning and governance, NU, as declared by “The Congress for the New Urbanism”, focuses mainly on the city itself with strong emphasis on its visualizing:

The Congress for the New Urbanism views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community-building challenge. . . . We stand for the restoration of existing urban centers and towns . . . We advocate the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian . . .

We are committed to reestablishing the relationship between the art of building and the making of community, through citizen-based participatory planning and design. We dedicate ourselves to reclaiming our homes, blocks, streets, parks, neighborhoods, districts, towns, cities, regions, and environment. (http://CNU.org/sites/files/charter_english.pdf)

The implicit assumption is that something went wrong in our cities and that by pointing at what went wrong and at what is needed, planners and urban designers will “see the light” and cities will once again become what they used to be in the past. The question of why things went wrong, or why neighborhoods became placelessnesses, is answered by new urbanism by reference to the writing of Jacobs, Krier, and Alexander among others. In this respect they differ from CPA in that social theorists such as Harvey and Castells see cities as derived from, or as representations of, society.

12.4 Complexity Theories of Cities: First, second, or third culture of planning?

And what about complexity theories and more specifically complexity theories of cities (CTC)? What do they have to say about urbanism and planning in the 21st century? On the one hand, the reality of 21st century – of highly connected global society, major and fast changes in world society . . . and all the rest – almost invites looking at it from the perspective of complexity theory. And indeed, some of the aspects of 21st century society and cities are often described in terms taken from the language of complexity theories and CTC: a most prominent example, as noted, is Castells’ (1996) *The Rise of the Network Society* while a more recent example is Healey’s book *Urban Complexity and Spatial Strategy* (Healey 2007). However, both Castells and Healey are using the notion ‘complexity’ literally without the theoretical formalism and meaning added to it by complexity theories. In fact, in Healey’s book there is not even a single reference to complexity theory.

A different case is the above noted recent book by Innes and Booher (2010) on *Collaborative Rationality and Complexity*. As in Healey’s book here too, the notion of complexity refers to the reality of the 21st century of a highly complex and connected society. However, unlike Healey, Innes and Booher do make explicit link to complexity theories as a domain of research. Two more books that should be

mentioned here are *A Planner's encounter with complexity* edited by De Roo and Silva (2010) and *Planning and Complexity – In Depth Analysis*, edited by De Roo, Hillier and van Wezemael (forthcoming).

Innes and Booher's book as well as most contributions in the above two edited books were made by students of planning and only a few by proponents of CTC. This is significant; firstly, since it indicates that the paradigm of complexity is becoming more and more relevant and attractive to students of the social theory oriented culture of planning. Secondly, since it indicates a potential for a fruitful discourse between the two cultures of planning and through it also between the two cultures of cities. As indicated above and elsewhere, it is my view that CTC can become "a link between space and place" (Portugali 2006), that is to say, between the two cultures of cities and their planning. More specifically, my view is that CTC have a lot to say about the 21st century city and can suggest interesting insight to the current crisis in planning. As already noted in Chap. 5, the fact is, however, that so far CTC have said very little about the 21st century city and its specific properties and even less on urban planning.

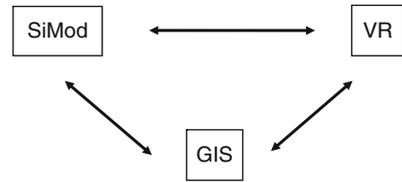
Potentially speaking, CTC have two messages to deliver to planning theory and practice in the age of postmodernity and globalization; the first is quantitative and the second qualitative. According to the first, CTC is seen as the second scientific culture of cities that similarly to the first culture, attempts to transform the study of cities and city planning into a science. According to the second, CTC indeed originated in the "hard" sciences and are thus genuinely "hard" scientific theories, but at the same time they share many properties with the "soft", hermeneutic, social theory oriented approaches. This dual nature has the potential to make CTC a bridge between the two cultures of cities and the two cultures of planning. Let me elaborate.

12.4.1 CTC: The Quantitative Message

How is CTC related to the above moving pendulum between the two cultures of planning? On the face of it the answer is apparent: complexity theory originated in the sciences, was applied to cities by scientists – physicists such as Peter Allen (1981) a student of Prigogine; and Wolfgang Weidlich (1994), colleague of Haken – and was enthusiastically adopted by "quantitative" students of urbanism. It is therefore not surprising that so far the main message delivered by CTC to planning is essentially quantitative and can be formulated as follows:

Indeed world society is becoming connected, society is becoming network society and so on, but the factors and forces that made our cities and system of cities more complex than ever before also provide us with the key to the solution: The last two decades have witnessed a dramatic progress in information and communication technologies. These technological changes indeed changed society but at the same time opened new possibilities. In the domain of cities and planning these new technologies created new potentials we urbanists and planners never had before: GISs (geographical information systems) that

Fig. 12.1 A typical planning support system (PSS)



can easily control and process huge amounts of information, VR (virtual reality) software that allow us to build virtual cities and regions and move in them in real time, cell-phones combined with GPS that increase communication between urban agents allow also real-time monitoring of pedestrian and car movements in urban areas, and finally the new sophisticated urban simulation models (USMs) backed as they are by the theories of complexity allow us to study the dynamics of cities as complex systems.

Each of the above systems is by itself a strong planning tool and if we combine them together into an integrative comprehensive system we get a planning support system (PSS) and/or decision support system (DSS) that is more than the sum of its elementary parts.

This is, in fact, the idea behind the DSSs and PSSs that are currently advocated as the state-of-the-art of the new, second science of planning (Brail and Klosterman 2001; Brail 2006). A standard PSS is a three-part system (Fig. 12.1) composed of a set of simulation models [usually agent based (AB) and/or cellular automata (CA)], a GIS and a set of 2D, 3D and VR visualization devices (to which one can add a monitoring system based on GPS, etc.). The AB/CA simulation models are assumed to enable the planners to simulate future scenarios representing current trends, and also to envision the impact of various plans and policies; the GIS provides the data base for such scenarios, the monitoring system provides real time information and feedback, while the visualization systems provide the means to see the results at a high level of realism. As an example for such a system see the O'Jerusalem PSS (Portugali et al. 2009).

The enthusiasm currently surrounding PSS is reminiscent of the excitement that followed the appearance in the 1950s and 1960s of the *rational comprehensive planning* and its arsenal of quantitative planning tools. "This is an exciting time for simulation modeling and visualization tools in planning and public policy," writes Brail (2006) and continues: "Planning support systems (PSS) have moved from concept to application. Is this future so bright . . . ?"

12.4.2 CTC – The Qualitative Message

But there is another message complexity theory has for planning and it goes like this:

Indeed complexity theory originated in the sciences and CTC is therefore a science of cities, but complexity theory is a new kind of science referring to systems and phenomena never explicitly recognized and studied before – open, complex, far from equilibrium systems that exhibit phenomena such as chaos, fractal structure, non-causality, nonlinearity,

self-organization and the like. Such systems are qualitatively different from the cities and urban systems envisioned and studied by proponents of the first, scientific culture of cities. The latter, as noted, treated cities as simple, closed, entropic, equilibrium-tending, linear systems.

In a recent article (Portugali 2008) I've suggested calling the approaches of the first culture of cities *classical* theories of cities and those of CTC *nonclassical* theories of cities (a distinction that echoes the terminology in physics). Classical systems are in principle simple, closed, predictable and causal. They might be highly complicated, but still simple in the sense that given all initial conditions, one can establish causal relations between their parts and predict their future state. Wrong prediction in such systems is the result of insufficient data or information about initial conditions. Complex, nonclassical systems, as we've seen above, are in principle unpredictable – given all initial conditions the future is still unpredictable. This is due to the property on nonlinearity, which in its turn is the result of the property of complexity.

Given the above differences between cities as classical systems and cities as complex systems, what are the implications to planning? What message has CTC to deliver to the planning of cities? What is the qualitative message of CTC to the domain of planning? The answer suggested below is that there are three facets to the qualitative message of CTC to planning: first, CTC suggest a cognitive approach to planning in cities – a new perception that entails the fact that planning is a basic cognitive capability of humans. This link between complexity, cognition and planning is discussed in Chap. 13 that follows; second, looking at cities from the perspective of complexity exposes the limitations of prediction upon which classical approaches to cities and planning are founded. This issue is elaborated in Chap. 14 below. Third, CTC suggest a bridge between the two cultures of planning – a bridge that becomes possible, on the one hand, due to some structural similarities between complexity theories oriented urbanism and social theory oriented urbanism, while on the other, due to some fundamental differences in the way the two bodies of theory treat cities. Chapter 15 elaborates on these issues. Finally and based on the above, Chap. 16 suggests a new structure of the planning system.