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**The Future of a Metropolis - Planning 100
Years Ahead!? Were the Predictions and
Considerations of Constantinos Apostolos
Doxiadis about the Future of Copenhagen
Only Academic?**

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**The Future of a Metropolis - Planning 100 Years Ahead!?
Were the Predictions and Considerations of Constantinos
Apostolos Doxiadis about the Future of Copenhagen Only
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Abstract

In 2013 - the important Greek architect and urban planner Constantinos Doxiadis (1913-1975) would have been 100 years old. Unfortunately, illness shortened his active and visionary work as he died at the age of 62. But during his remarkable career he managed to leave his mark on urban development and professional discussions of his time in both theory and practice.

In 1963 Doxiadis - at the request of the Danish Architects' Association - formulated some suggestions for the future development of Copenhagen. He called his contribution: 'a few abstract considerations', and argued for a 100-year plan; this triggered a lively debate among Danish urban planners of the period.

To what extent was Doxiadis correct in his analyses and predictions? What is the result if you compare actualities to Doxiadis' attempts not to get bogged down in detail but instead remain at a more general and 'abstract' level? And to what extent were the sceptics of the time right in their criticism of Doxiadis' approach?

Are Doxiadis' contributions, in the form of his Science of Ekistics and his statements from the 'Delos Declaration', still topical and valid with regard to the insistence of contemporary urban-planners, in their efforts to achieve quality of life and sustainable urban development?

Key words: Doxiadis, Copenhagen, urban planning, sustainable planning, Ekistics

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Introduction

In 1961, Doxiadis was invited to Copenhagen by the Danish Architects' Association, in collaboration with the School of Architecture, to give a talk about his theories and especially his views on the future development of our cities. The lecture¹ was held at The Royal Danish Academy of Fine Arts.

The lecture was a basic presentation of Doxiadis's theoretical science, Ekistics, in which he introduced the wedge-shaped urban development model, the Dynapolis, a model that would do away with the traditional concentric structure; a structure which Doxiadis's did not believe would be able to solve the problems of the modern city's explosive growth.

With his lecture Doxiadis created so much interest in his theories, that, two years later, he was asked to write an article in the Danish Architects' Academic journal, *Arkitekten*, on his views on the future of Copenhagen. Doxiadis agreed, but stressed that he actually had only a very partial knowledge of Copenhagen based on a few days' visit and on what he had been able to read in available reports. He therefore proclaimed that he would be looking at Copenhagen from a more abstract point of view, as an expert who comes from the outside, seeing things with fresh eyes, and is able to perform an abstract analysis of the problems and possible solutions. He said: 'looking at the cities in an abstract way, sometimes helps us avoid the pitfalls resulting from having knowledge of a situation which sometimes means we depend too much on details.'²

To illustrate our ability and experience to predict a trend in the near or distant future, it might be interesting to look at the attempt Doxiadis made to formulate a vision for the future development of cities - including the Danish capital. By comparing such a vision not only to the 60s, i.e. to contemporary politicians' and practicing urban planners' scepticism of Doxiadis's theories, but also to urban theories and to the views and definitions of terms such as 'formless'³, 'boundless cities'⁴, 'Cittaslow'⁵, etc. held by today's generation of urban researchers, we might gain a broader understanding of the laws - or lack thereof - that both past and present urban planners have to deal with.

Doxiadis' Background Information and Methodology

Doxiadis stated clearly that his approach would be abstract, a kind of helicopter-perspective from which he would try to identify some broad outlines

¹Skriver, P. E. (1962). 'Constantinos Doxiadis.' *Arkitekten*, 1962, no. 4:65-67 [In Danish]

²Doxiadis, C. A. (1963). 'The Future of Copenhagen - a few abstract considerations.' *Arkitekten*, 1963, no. 4: 61-76. [In Danish]. Also printed by DA as internal report R-GA 289 (Constantinos A. Doxiadis Archives, Articles-Papers 2647) [In English]. + Abstract version: *Ekistics journal*, v.15, no.89, April 1963, p. 188-196. [In English].

³Nielsen, Tom (2001): *Formless, The Surplus Landscapes of The Modern City*, Aarhus: The School of Architecture Press. [In Danish]

⁴Clemmensen, Thomas Juel (2011): *Boundless Cities - new perspectives on city- and landscape architecture*, Aarhus: The School of Architecture Press. (Anthology) [In Danish]

⁵'Cittaslow', movement founded in Italy in 1999. Goals include improving the quality of life in towns by slowing down its overall pace.

of possible future developments. He compared his method with what he called the old story of the trees and the forest.

*'To understand the whole situation one must be able to look at the trees as details and the forest as a whole. Often it is difficult for the people involved with the individual trees, with the details of day to day problems, to zoom out and look at the whole.'*¹

So what was it Doxiadis thought he could deduce by taking this helicopter view?

Doxiadis first took stock of the existing situation by characterizing Copenhagen as a dense medieval city that has grown into the twentieth century based on a clever master plan outline, 'The Finger Plan' of 1947, an unofficial policy plan which has served as a practical manageable tool and source of inspiration for contemporary and future development plans for Greater Copenhagen. The plan was later followed by official plan documents in 1949 as well as adjustments and a number of planning documents in 1961 and later. Doxiadis expressed great respect for the Finger-plan as, in his opinion, it courageously broke with the limiting city walls while maintaining that inner Copenhagen should remain the central area of the metropolitan. He noted that the intention of the plan was not to create a new city built on the old city structure, but a city that would primarily grow along its radial main traffic lines. By devoting space between the 'fingers' to green wedges, and proposing an expansion of the S-train network with a line radiating out from each finger, supplemented by buses and trams between the fingers, it did create sensible public transport systems that could provide access to both the green and recreational areas for planned housing, production, administration and service centres and the centre of Copenhagen and its historical city core. The S-train network was the backbone of the Finger Plan's traffic system, and the aim was to ensure that it would be possible to reach the capital, even from the remotest suburbs, within 45 minutes.

Doxiadis' Forecasts - His Discussion and Conclusions

When asked about his views on the development of the city, Doxiadis first commented on the official plan documents and their forecasts of population growth both nationally and in the metropolitan area. He compared the contemporary forecasts of population density developments to his own experience from other cities that have grown influenced by private car transport. Here he noted that the use of land of cities increases to a much greater extent in areas characterised by increasing engine power.

Doxiadis imagined that the reason for the planners forecast of slower growth in Copenhagen was their belief that growth would be hampered by the

¹Op.cit. footnote 1: p. 61

scarcity of land. But Doxiadis strongly believed that we should expect land use in the year 2000 to be well above 400 m² per capita. This was based on two assumptions of his: that the then number of registered private cars, 200,000, would grow to 1 million - an increase of 400% - and that built-up areas would increase by 200%.

Regarding the problem of the population growth, which those official forecasts expected to be 66% for the next 40 years for the Copenhagen area, he stated that Copenhagen should consider itself lucky if it could settle for a share of 1 million of the total increase to the population of cities of 2 million. He thought it was an optimistic assumption and predicted a further doubling of population from 1.5 million to 3 million. Doxiadis furthermore predicted that an increase of 1 million inhabitants would require an increase in housing of ½ million, that is, an increase in the housing stock of 100%, from ½ to 1 million homes - although he thought that this was a low estimate for a population growth of 66%.

The main foundation of Doxiadis's thoughts on the development of the Danish capital was, of course, the ideas he had developed through his practical and theoretical work and which he later formulated in his 'Ekistics - An introduction to the science of Human Settlements'¹. As is generally known, he thought he was able to predict that today's dynamic cities will always evolve along their easiest passable roads, form temporary star shapes or finger plans, where secondary traffic opportunities slowly fill the spaces between the fingers and star tips, and so gradually, over time, come to resemble the circular shape, which was the starting point of the original and more static city. He thus concluded generally, that the big urban dilemma is still the problematic relationship between the expansion of the original city centre and its newest, peripheral urban zones. According to his own study Doxiadis believed, that the abnormal concentric growth of large cities tends to smother old city centres, and for this reason he suggested his so-called parabolic development model, in which the city centre is ensured a development opportunity in one direction along with the continued growth of surrounding urban districts. His whole mindset was based on the idea of continuing accelerating growth, which would result in a fusion of many dynamic cities, from Dynapolis to Metropolis. This process would continue and many Dynametropolises would merge to form a Megalopolis, which would in turn continue as dynamic urbanization. He spoke of the 'City of the Future'² and 'The Global City'³ and gave his thoughts on cityscapes in 2100, for which he envisioned 'a single planetary city that would comprise newly built and old cities replanned and networked together'⁴.

¹Doxiadis, C. A. (1968). *EKISTICS, an introduction to the science of Human Settlements*. London: Hutchinson & Co LTD. (New York: Oxford University press, 1968).

²Doxiadis, C. A. (1972). *Ekistics*, June vol. 33, no. 199: 427 + Doxiadis Archives, Research, COF

³Op.cit. footnote 1.

⁴Richards, Simon (2011). 'Halfway between the electron and the universe, Doxiadis and the Delos Symposia'. *Scale, Imagination, Perception and Practice in Architecture*: 171. London & New York: Routledge.

Doxiadis refers in his article to research, which he has conducted at the Athens Technological Institute, with the aim of demonstrating that there would be little prospect of changes in population patterns and economic growth in the coming generations. Based on these studies he believed that he was able to ascertain, that within the next hundred years we would see continued growth in population, economy, land use and the use of machinery and new technology. He referred to forecasts showing ‘that we will have a coherent network of cities which will cover all continents, in fact the whole earth.’¹ He did not believe we could avoid such a development. He also saw an opportunity - if his assumption proved correct - that from 1963 to 2063 the world's population would increase from 3 billion to 24 billion, that growth would then diminish, perhaps even slow down sooner, if current political systems were allowed to continue.²

Doxiadis envisioned, according to his prediction of an eight-fold increase in the world population over the next hundred years, that we are in the first phase of a development towards the universal city, ‘Ecumenopolis, the city of which Copenhagen will be a small part.’³

As mentioned above, Doxiadis pointed out the finger plan for its courage, but he had also noted that the plan's intentions of creating optimal public transportation have, unfortunately, not been followed consistently. He found that the two important lines of development along the north coast and south coast were poorly served by public transport in relation to achieving the ‘45 min. criterion’.

Long-term-planning:

Doxiadis recognized that it is generally difficult to convince the public about what is realistic and hence about the utility of long-term planning, but he would nevertheless agitate for the necessity of planning further ahead, and he therefore suggested, that we should look not only 40 years, but 100 years ahead!

He pointed out that too many cities are being developed based on a static city-plan, and that is the reason for their weaknesses and lack of adaptability. He emphasised Copenhagen and the Finger Plan as one of the best examples of an attempt to be forward-looking, to take into account dynamic developments. But he also pointed out that in our planning we must never be afraid of the unpredictable and above all not use such fear as an excuse.

‘In many ways we can predict what will happen. After all, the laws of urban growth will not change from one day to the other. Here again we must speak of the need to have a theory on urban growth, which,

¹Doxiadis, C. A. (1963). ‘The Future of Copenhagen - a few abstract considerations.’ *Arkitekten*, 1963, no. 4: 61-76. [In Danish]. Also printed by DA as internal report R-GA 289 (Constantinos A. Doxiadis Archives, Articles-Papers 2647) [In English]. + Abstract version: *Ekistics journal*, v.15, no.89, April 1963, p. 188-196. [In English].

²Ibid.

³Ibid.

independent of technological change, will remain valid and able to help us understand what the future will bring.^d

In brief Doxiadis' main thesis is: that over the next 100 years Copenhagen will increase its rate of growth, and he estimated that in 2060 it will be a city with around 5 - 5.5 million inhabitants, a total of 2.5-3 million dwellings, and that the number of cars would, as a minimum, increase to 2.5 million. In 2060 the developed area would cover 3,000 km², i.e. six times greater than what was predicted for 2000. Such a large amount of dwellings will increase demands for recreational areas, so space requirements will double, and the urban agglomeration will cover an area of up to 6000 km², i.e. in practice covering most of Sealand. The consequence of this growth and this need for space will result in the creation of a new centre of gravity for Copenhagen, Doxiadis predicts. This new centre will be of great importance for the survival of Copenhagen, and he is convinced that it will move to the south-west, to the city of Ringsted, as a result of his proposed parabolic- shaped developments.

It is tempting to link the predominant doctrine of Doxiadis: the continuing accelerating growth, with his experience from his involvement in the 3rd World. This experience has certainly affected his view of the global planning situation. Based on this conviction, he argues for long-term planning: to prepare for the construction of a new urban centre of gravity, which must, in a continuous process, take into account new types of urban functions and accommodate the unpredictable.

Contemporary Criticism

Contemporary Danish and international planners responses to Doxiadis' forecasts and proposals for necessary interventions were divided into two camps: there were those who saw Doxiadis' discussion Paper as a confirmation of their own views on growth theory and the dangers of underestimating the growth-promoting factors, and there were those who were critical of the bleak prospects of the Greek town planner, because they felt his predictions were overblown.

The supporters recognized the importance of long term planning beyond 2000, and the opponents attacked Doxiadis for his abstract and objective point of view. They questioned whether it was possible to plan 100 years ahead, as there would be factors which would change, and unknown factors which would be added; factors which may totally change the conditions of the dreaded growth.

One of the contemporary renowned professors at The School of Architecture in Copenhagen, Peter Bredsdorf, praised and recognized Doxiadis' serious commitment. He even went so far as to suggest, that Doxiadis' predictions about growth may be on the low side, as Doxiadis has not

^dOp.cit.: p. 70

mentioned the 'Ørestad'¹ and the consequences of a future plan for a bridge connecting Copenhagen with the Swedish city of Malmö - factors that Bredsdorf believed might very well promote accelerated growth on both sides of the strait. Bredsdorf agreed with Doxiadis that long-term investments require long-term planning, but expressed scepticism about the theory in relation to Copenhagen, that its building-related centre of gravity – in the form of a new urban centre – should be moved to the central part of Sealand. He also supports Doxiadis' point of view that the majority of urban development should be directed towards the southwest – 'towards Sealand and towards Denmark in connection with the creation of one or more new centres of a higher order'²

Copenhagen's former chief city engineer, Poul Vedel, agreed together with Bredsdorf, that Doxiadis was right in his main considerations about the future needs for increased land use. But he found it unclear how Doxiadis' model and theories of a parabolic and dynamic city and centre expansion - with a centre shift far to the west – might take place, and how the relationship between such a new centre and the existing, historic city area should be geared. He also found questionable the value of a planning horizon of 100 years.

As a representative of some critical views of contemporary laymen are the writer Harry K. Meier's contribution to the debate about the value of Doxiadis' forecasts. Meier primarily attacks that Doxiadis claims to have evidence: that the contemporary population patterns and economic growth will not change in the coming generations. And he marvels at the paradox of the claim, that precisely because the structure of population patterns do not change, the urban will have to change - and that we should anticipate *more of the same* but *not in a different way*. He finds the allegation of having scientific evidence questionable, since he claims that one might just as well imagine that the constantly changing mix of cohabiting generations - with very different approaches to the last achieved technological breakthroughs - will also cause a constant and dynamic process of change in population patterns, and result in changing attitudes and approaches to work and transport, social and cultural values. He finds it more likely that as we are inundated with cars, there will be a shift in several areas in our perception of the value of the car. The assumption that the population pattern will, at all times, be a *constant* which will simply grow larger but not change its nature, he finds frivolous to use as basis for the planning of future urban communities. In general, he believes that Doxiadis' predictions appear to be out of touch with the reality that they claim to have analyzed.

The German/Canadian urban planner Hans Blumenfeld is an example of a more detailed comment on Doxiadis' vision.³ Blumenfeld expressed his respect

¹An undeveloped open area. (310 hectares).

²Bredsdorf, P. (1963) *Arkitekten*, 1963, no. 6: 115 [In Danish]

³Blumenfeld, H. (1963). 'A Hundred-year plan?'. *Arkitekten*. 1963, no. 19: 355-360 [In Danish]. Also published in *Ekistics journal*, v.17, no.99, February 1964, p. 75-81, as "A hundred year plan? - The example of Copenhagen", [In English]

for Doxiadis' forecasts as a basis for discussion and recognized a few of the assumptions in his article. But divergent views on the future predominate:

Blumenfeld did not believe that the world population in 2063 will be 24 billion, but rather 16 billion, because he believed in a dramatic decline in population growth in the underdeveloped countries in the early years of the 21st Century.

He also believed that Doxiadis took too little account of the fact that the trends and the factors that originally specified the location of cities, namely access to raw materials, energy and transport lines are changing and moving towards a greater priority of access to markets and to a large and varied supply of skilled labour.

Blumenfeld thought Doxiadis was wrong in his assumption, that the potential Copenhagen region would be limited to the island of Sealand thus ignoring the Swedish peninsula, Skåne, on the other side of the strait. In this context, he also disagreed that the urban centre of gravity would move to the south-west towards central Sealand. And he believed Doxiadis overlooked the fact that the 20th Century development in European and American cities demonstrates: that the growth of the centre is much slower than the growth of the city as a whole.

Blumenfeld and Meier share the view, that the accelerating rate of the social, economic and technological change makes it highly questionable, that we can predict the goal that people will strive for in fifty or a hundred years. And the idea that the situation of the social-political world would continue unchanged for a 100 years without this leading to a disaster, Blumenfeld considered a significant erroneous premise of Doxiadis' forecasts.

We can summarize the main divergences in Blumenfeld and Doxiadis' theories: Where Doxiadis will locate a new main centre in what he calls, a hypothetical region's centre of gravity, Blumenfeld will locate the region around an existing centre. But Blumenfeld also emphasizes that any prediction reaching more than 25-30 years into the future, will be subject to a probability level of less than 50%, and he further points out that it would be a serious mistake, with such low probability, to draw up a plan to be approved now which will serve as a guide for investments in the distant future.

Blumenfeld conclude: 'We must definitely think 100 years forward or longer, but we cannot afford to plan further ahead than we can predict with reasonable probability'.¹

Result & Discussion

Here 50 years after, and midway through the planning perspective proposed by Doxiadis, we can take stock of the actual development. And it is

¹Blumenfeld, H. (1963). 'A Hundred-year plan?' *Arkitekten*. 1963, no. 19: 360 [In Danish] Also published in *Ekistics* journal, v.17, no.99, February 1964, p. 75-81, as "A hundred year plan? - The example of Copenhagen", [In English]

understandable that not only Doxiadis, but also his supporters and opponents, could not claim to be in possession of prophetic abilities. All their predictions were based on assumptions. Since 1963 there have been several dramatic changes in the assumptions that they have been able to relate to. Conditions for growth has changed radically. Doxiadis had not been able to foresee the recessions caused by wars and conflicts, neither the oil and energy crisis following already 10 years later. Neither could he foresee that the escalation of oil prices, which occurred several times (in 1973-74, 1978-80 and 1990-91), would be a major influence on the growth of private cars in Denmark, nor the growing ecological awareness and increased responsibility with regard to energy consumption which created the foundation for the culture that has arisen in Denmark, and especially in Copenhagen: that of using the bicycle. Possible introduction of payments for permission for automobiles to enter the central Copenhagen have also changed the status and value of the cars in the optics of the urban inhabitants. If we add 9/11 and the global financial crisis, it is indisputable that the picture of the world since 1963 has changed radically. The western world, and major European cities and Copenhagen in particular, was - if not forced - strongly encouraged to think and plan differently.

The fact that there is today a growing focus on sustainable planning strategy, which takes into account the highly differentiated growth problems that exist in different parts of the world, for this we should rightly give Doxiadis considerable credit. That there is a clear trend today among prominent planners to insist on sustainable urban development, and to work with cities and urban space potentials in the human scale, also has a certain connection to the discussion Doxiadis helped promote, in particular with his Delos-Symposia.

If the trend had continued in the direction that was mapped out in 1963, far more of Doxiadis' assumptions might have become a reality today.

Although Doxiadis was correct in his reflections on Copenhagen's development along the city's main roads, and especially with regard to the development towards the south and the connection to the rest of Denmark and Europe, and although we recognise significant views in Doxiadis' discussion paper, which is highly topical in today's debate, actual developments departed from Doxiadis's forecasts on 3 key areas - areas which may be said to be basic conditions for physical changes of the city:

1. Population growth
2. An increase in the number of private cars
3. An increase in the city's land use

Population Growth

Today Copenhagen, the city and its suburbs, has a population of 1.2 million. Constructions of new housing areas, able to cater for a population of 100,000 new residents by the year of 2025, have been planned. That the population growth of Copenhagen - as indicated by Doxiadis - should increase, from 2025 to 2063, from 1.3 to 5.5 million people, does not seem likely. The

population growth of Copenhagen is now expected to increase by 19 % over the next ten years.¹

Growth in Private Cars

The number of private cars in 1963, in the Capital Region, was 200,000. That number has now increased to 587,200, i.e. an increase of 293 %, but still, only half of the level predicted by Doxiadis for 2000. Recent figures from the Copenhagen Centre for Transport show that, although traffic the past 20 years has increased by 28%, it has *decreased* by 1.7% from 2007 to 2010.

In 1963 the total number of private cars in Denmark was 548,000. This figure has over the last 50 years increased by approx. a factor of 4 to 2,237,000.

That the number of private cars in Copenhagen alone, from now until the year 2063, should increase according to Doxiadis' forecast: from 587,200 to 2.5 million does not seem likely.

The Increase in the City's Land use

According to the two paragraphs above, the need for an expansion of the city's built-up areas will be much less than outlined by Doxiadis. Today planners state that it is hard to believe that, even in 2063, Copenhagen would cover the majority of Sealand, neither do they believe in a new centre of gravity in the centre of the island. In place of such major expansion the city currently develops in a new master-planned suburb, the 'Ørestad', south of downtown. Furthermore the land, which has just been released by the departure of heavy industry in 'Nordhavn' – the docks north of the city centre – has created space for the development of attractive residential and commercial areas. This latest development was initiated in the early 90s and has, along with the opening in 2000 of the combined road and rail bridge-tunnel, which has connected Copenhagen with the Swedish city of Malmo across the strait, created some opportunities to meet the needs of the city and its vital functions for growth within a limited region.

This is far removed from Doxiadis' prophecy of the occupation of an area of 6000 km² and the development of Copenhagen as part of Ecumenopolis by the year 2063.

Since all predictions are invariably - to a greater or lesser extent - based on statistics and probability calculation, depending on the amount and nature of the calculated 'objective' data and information, they are subject to a margin of error. A fundamental element of Doxiadis' planning work was his focus on quantitative data collection. Doxiadis was recognized as a pioneer for his introduction and use of new technologies for data processing and integration of comprehensive multidisciplinary expertise to qualify the concept of analysis and the interpretation of this data collection.

In theory, to be able to reduce the margin of error for a future forecast to zero would obviously have required a data processing technology with an

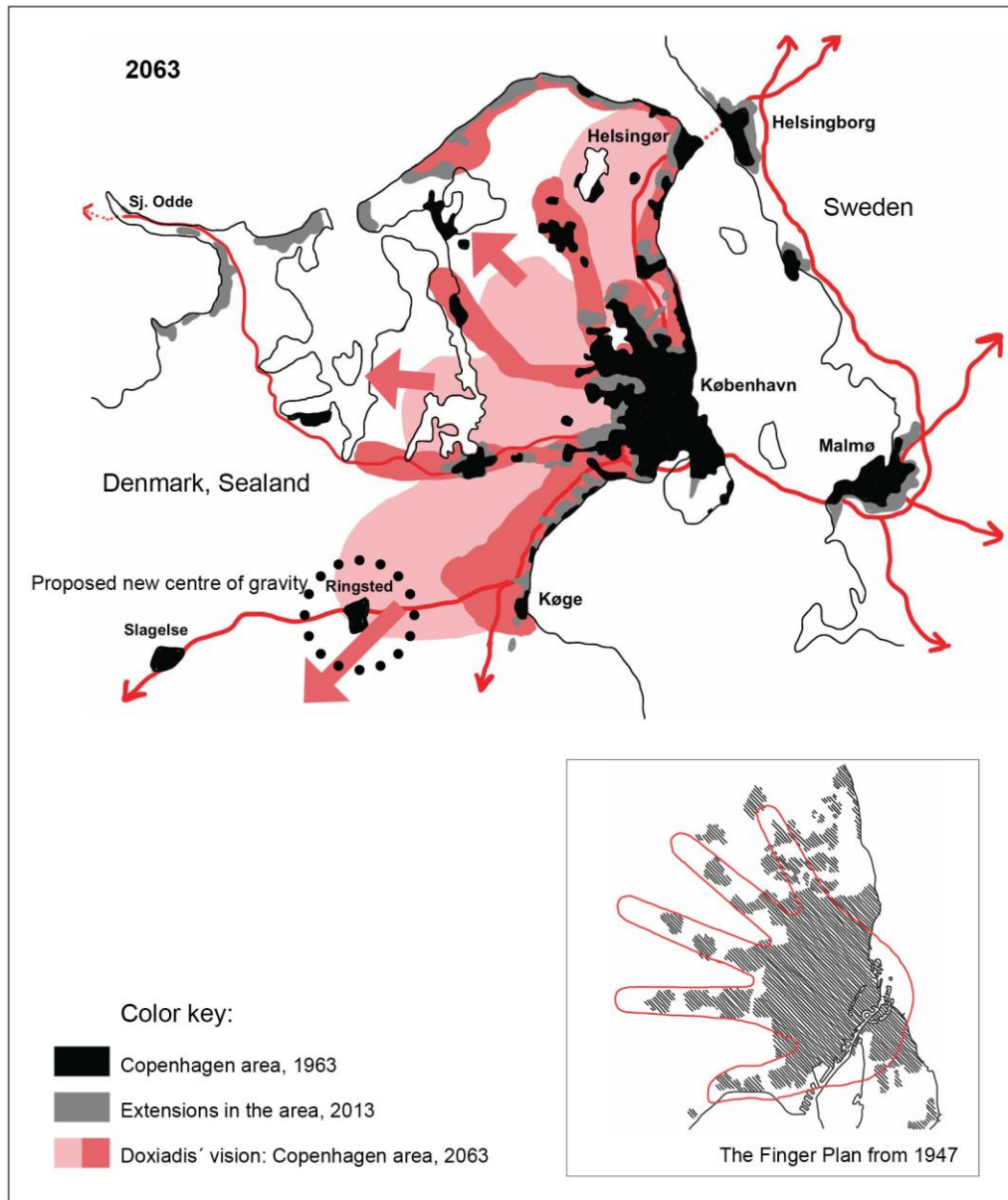
¹'Danmarks Statistik' (Statistics of Denmark: <http://www.dst.dk/da>)

infinite digital force to be fed with an infinite number of data in relation to the overall processes of the planet as well as the universe. It would have to be a 'time machine' - a digital Nostradamus – this machine would have to presuppose that history is based solely on causal and – in best case – final relationships and would have to ignore any 'random' features. It is of course a completely unreasonable request, that Doxiadis, like a time machine, should have supernatural prophetic abilities.

But despite the fact that Doxiadis has obviously misjudged the skyrocketing of growth, he has challenged the debate in a positive way by his recommendation of a long-term planning perspective. How far ahead can we hope to predict developments and describe future scenarios with precision? This question may be less essential. It is more significant that, as Doxiadis and Blumenfeld also agreed on, we should continuously formulate goals, develop strategies and take action to correct and prevent the disasters we can predict are certain to become a reality, if we do not think in the long term and change our course on areas vital to living conditions in the cities and on the planet's ecological systems in general. And when we take the initiative to do more long-term planning, it is important that the models and framework – as Doxiadis recommends - do not operate with the city as a static matter, but try to cater to a dynamic program development. Budgeting for the future and continuing qualification of our planning efforts is crucial to the successful management of the processes that shape our cities. It is important that we plan with insight, foresight and global responsibility, because 'How often do we fail to realize that no planning at all is better than bad planning'¹

¹Doxiadis, C. A. (1963). *Architecture in transition*, : 29. London: Hutchinson & Co LTD. (New York: Oxford University press, 1968).

Figure 1. *Copenhagen and the northern part of Sealand (+ the 'Finger Plan')*



Illustrations: Jan Fugl