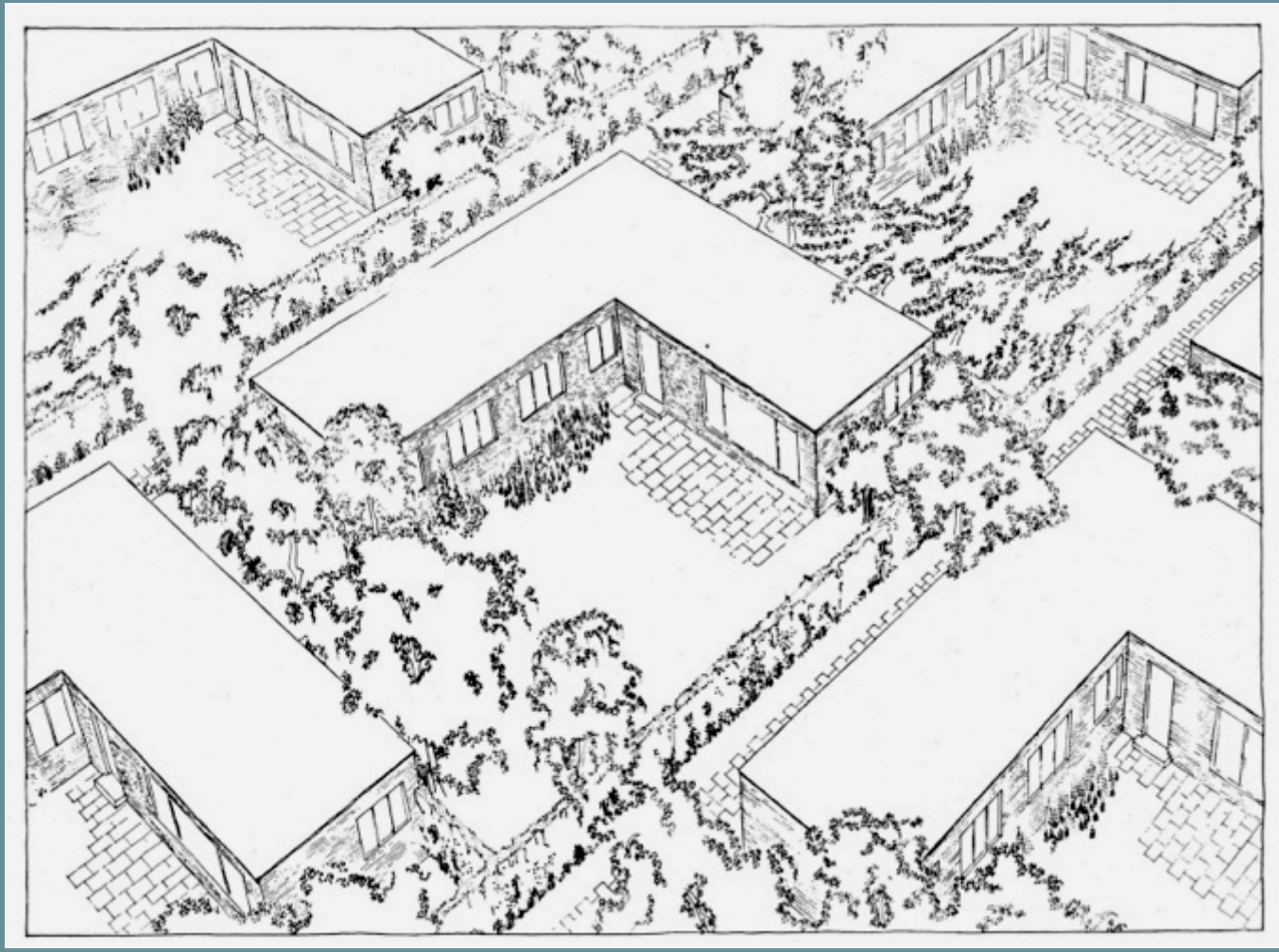
Urban Form, Density & Micro-Climate: take-home lessons for planners

Michael Hebbert, Bartlett School of Planning, UCL

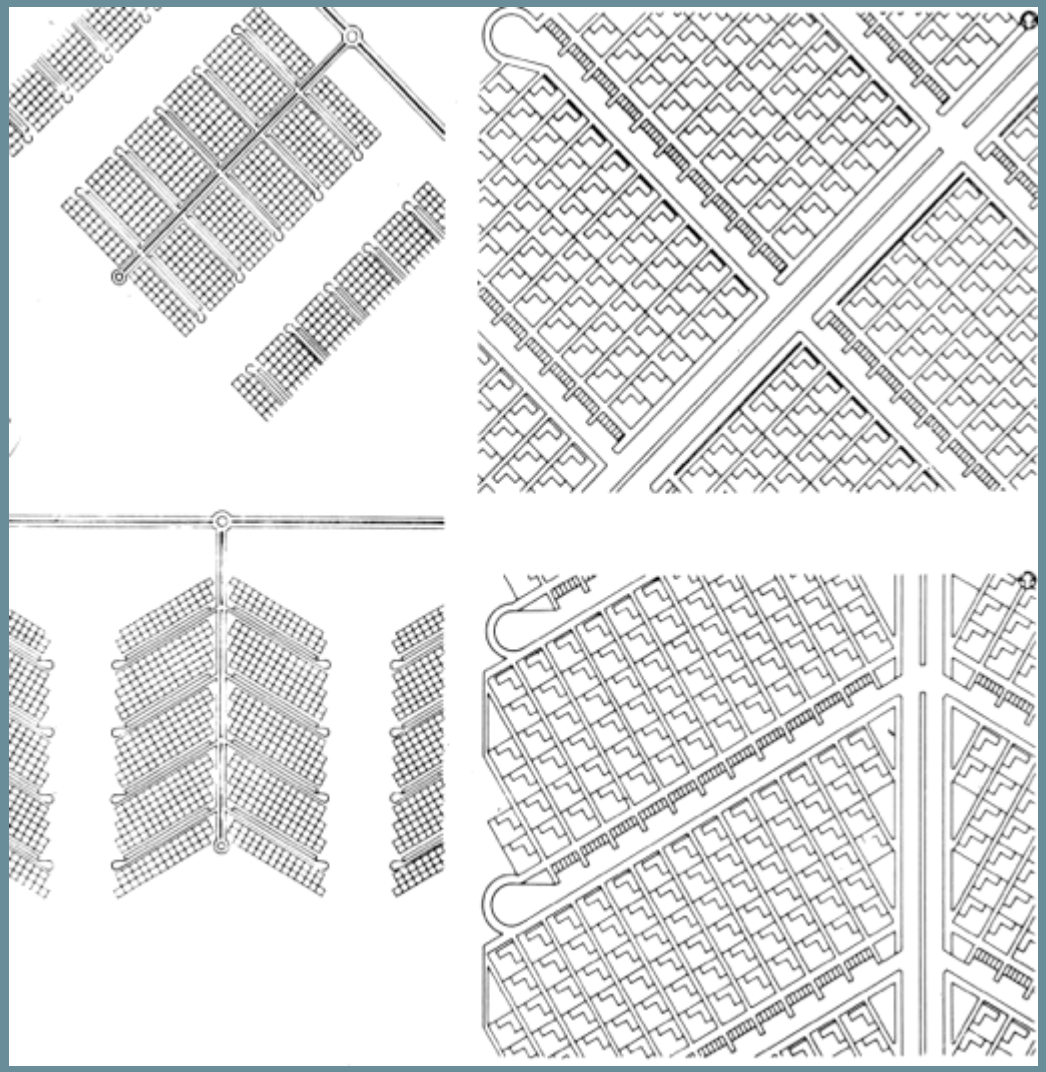
The Edge Debate

Tuesday November 13th 2018

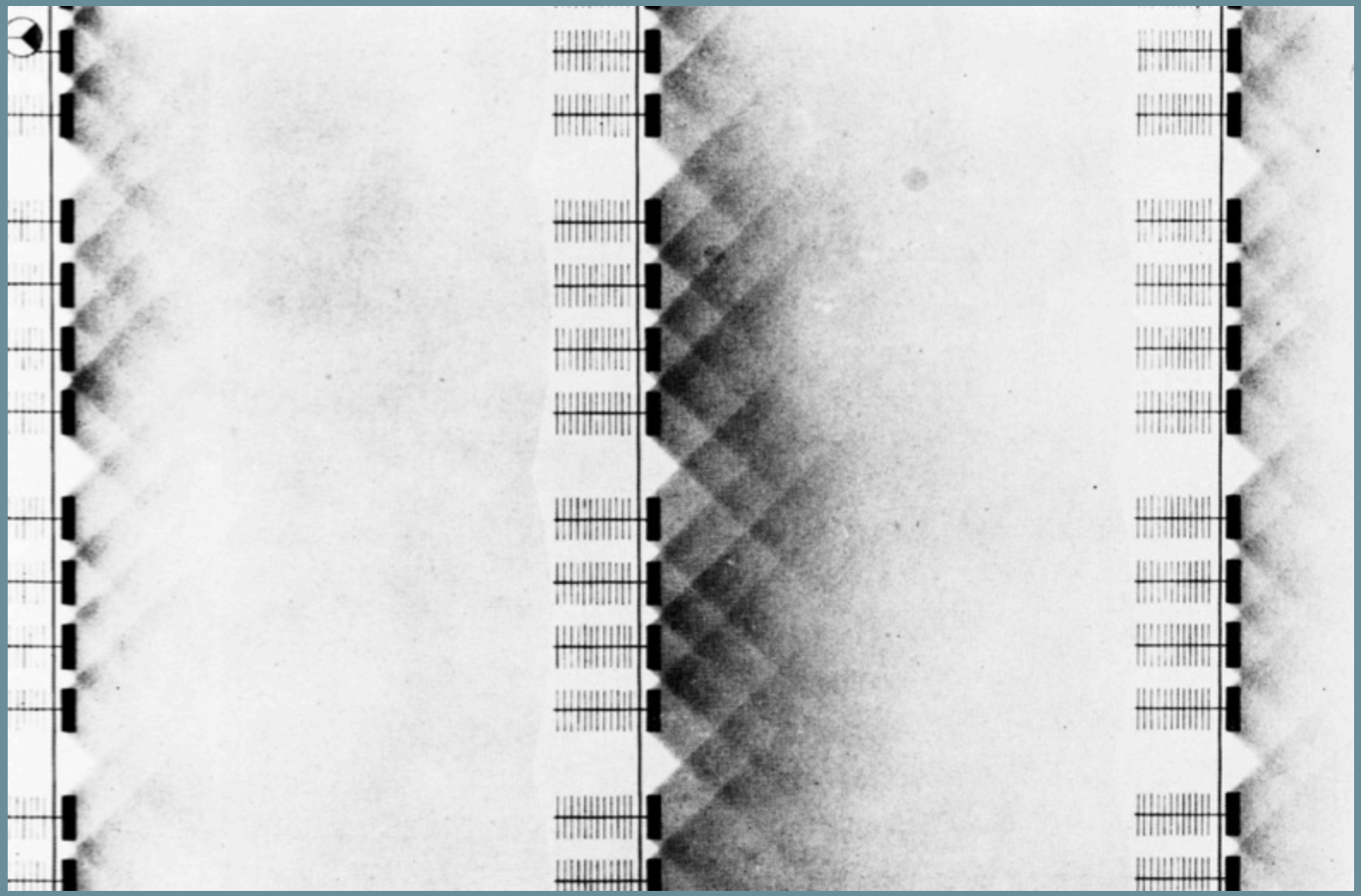
1. How not to do it



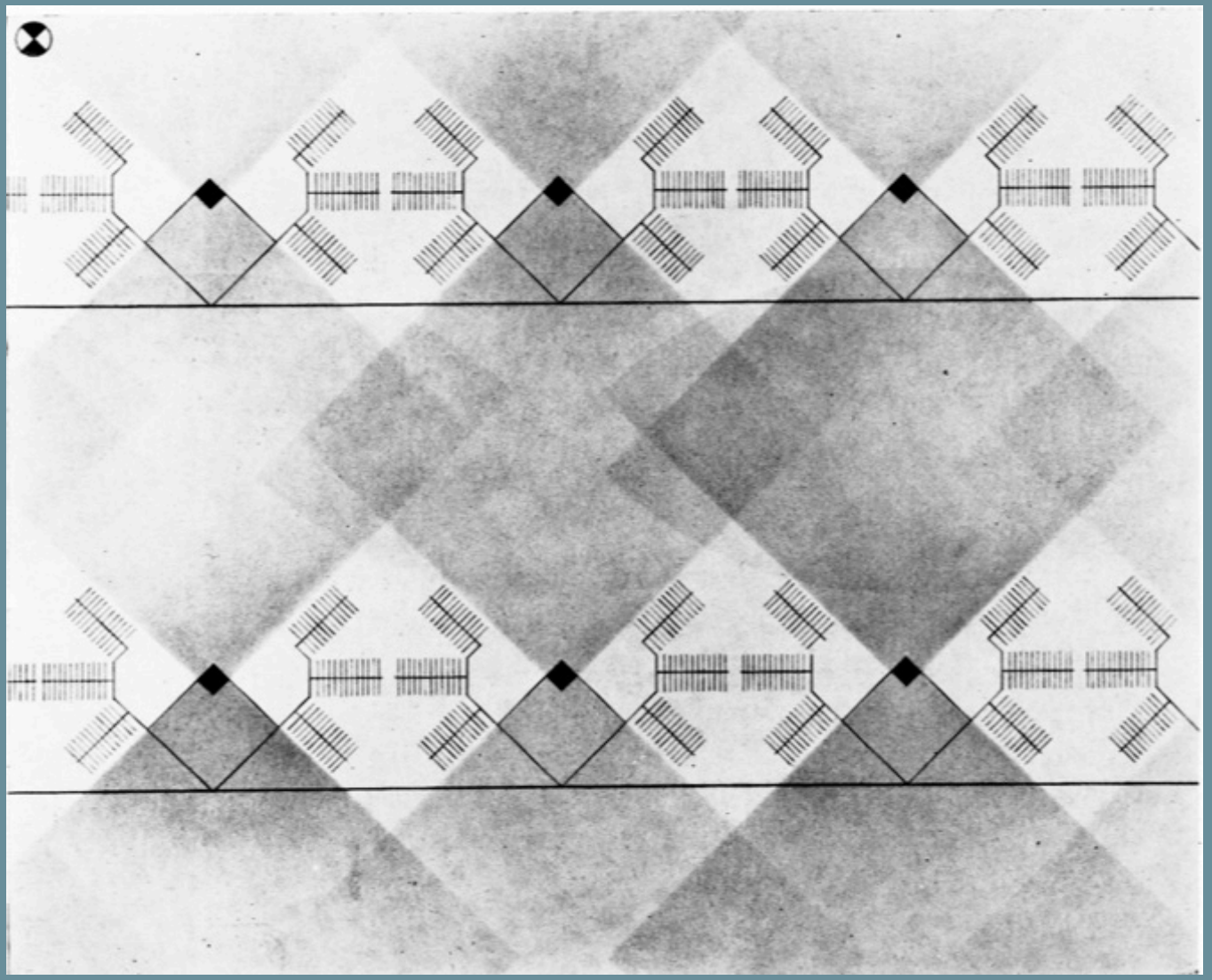
L. Hilbersheimer specifies L-shaped dwellings for optimal insolation



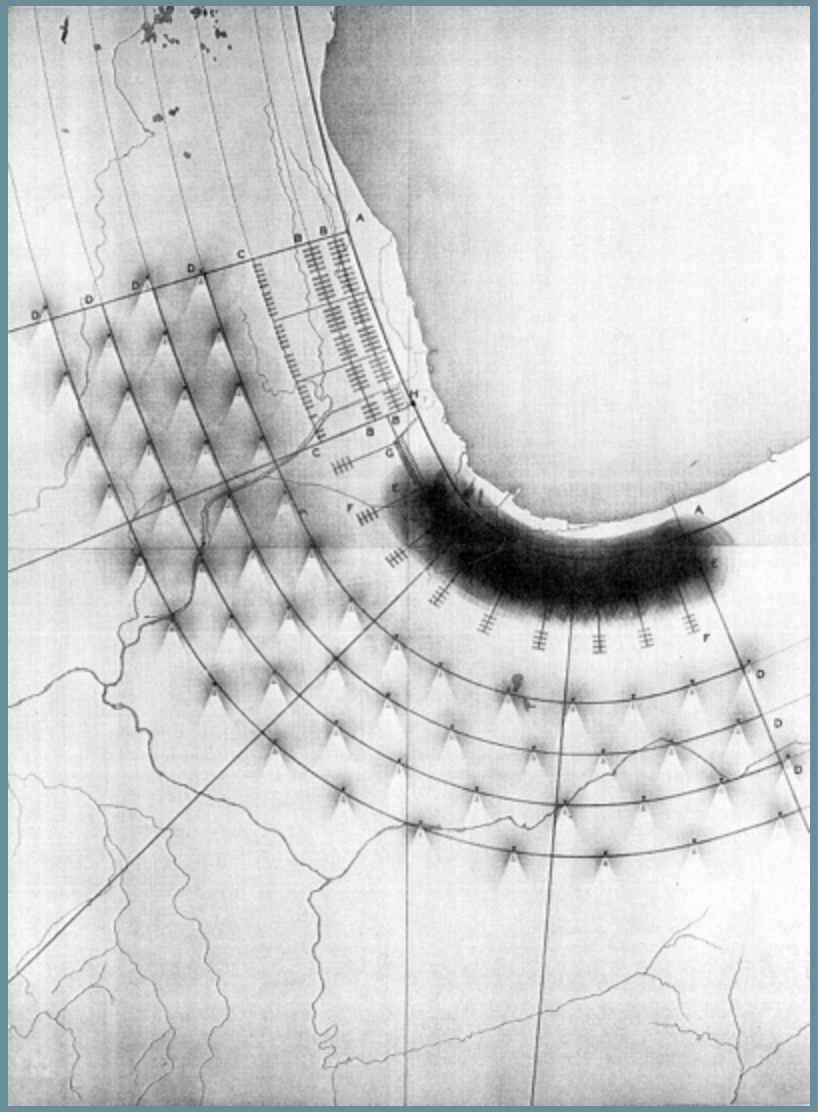
and recommends removal of all non-residential building from neighbourhoods in order to optimise air quality



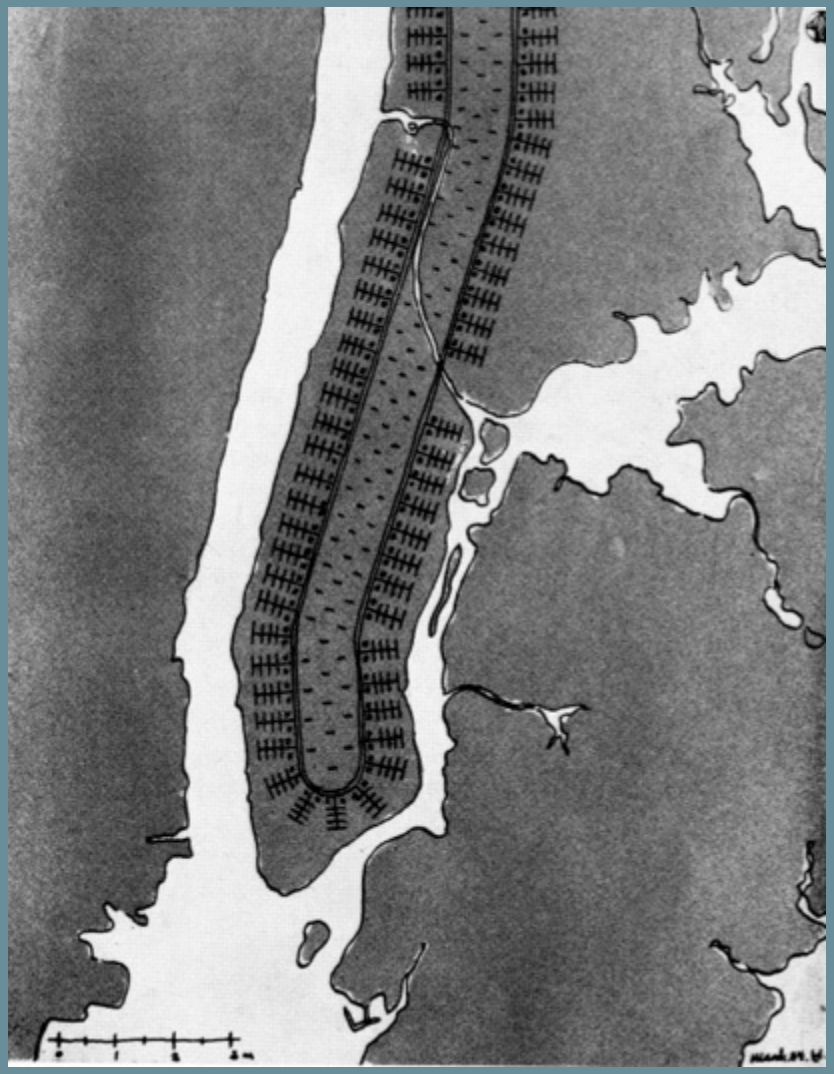
and advocates an entirely new urban form to facilitate 'natural' pollution dispersal on the prevailing wind



(or prevailing winds, as the case may be)



here he proposes the application of his theory to Chicago



and here recommends a different urban form for Manhattan.

Misunderstanding public policy

Single-formula approaches to public policy fail because

a) the public interest is multidimensional

b) collective action involves considerations of equity, due process and natural justice

Misunderstanding public policy

Realistic take-home messages must be administratively credible

Relevant to the variety of legal régimes and political systems

Matching the resources and competences of implementing units

Addressing more than a single issue of concern

Adequate to all times and seasons

Learning from the sciences of urban form and climatology

Learning from the sciences of urban form and climatology

Urban climate science : long history (Hippodamus, Vitruvius, Alberti, Palladio, Howard, Pettenkofer etc) but slow gestation

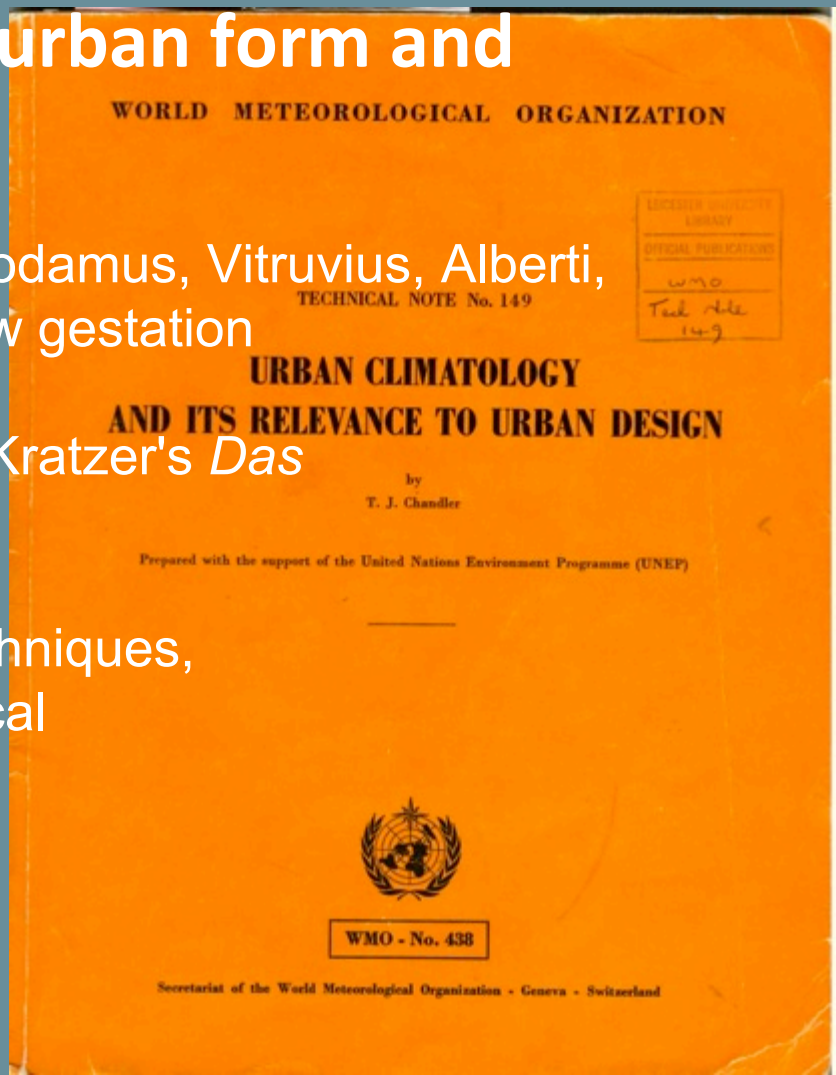
Birth of modern urban climatology, Albert Kratzer's *Das Stadtklima* 1937

Learning from the sciences of urban form and climatology

Urban climate science : long history (Hippodamus, Vitruvius, Alberti, Palladio, Howard, Pettenkofer etc) but slow gestation

Birth of modern urban climatology, Albert Kratzer's *Das Stadtklima* 1937

Postwar development of observational techniques, microclimatic theory, physical and numerical modelling, international scientific networks



Learning from the sciences of urban form and climatology

Urban climate science : long history (Hippodamus, Vitruvius, Alberti, Palladio, Howard, Pettenkofer etc) but slow gestation

Birth of modern urban climatology, Albert Kratzer's *Das Stadtklima* 1937

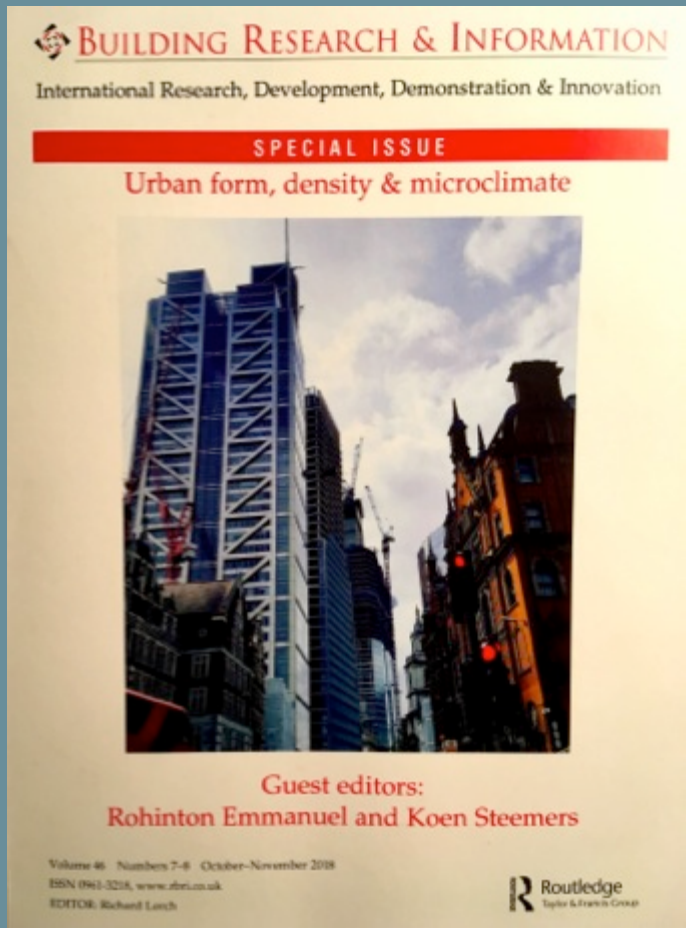
Postwar development of observational techniques, microclimatic theory, physical and numerical modelling, international scientific networks

Consequent development of planning tools such as the *Klimaatlas* VDI3787 (2008)

Learning from the sciences of urban form and climatology

Hilbersheimer looked for simple prescriptive rules to optimise human habitat

But the more we know, the less easy it has become to discern decision principles



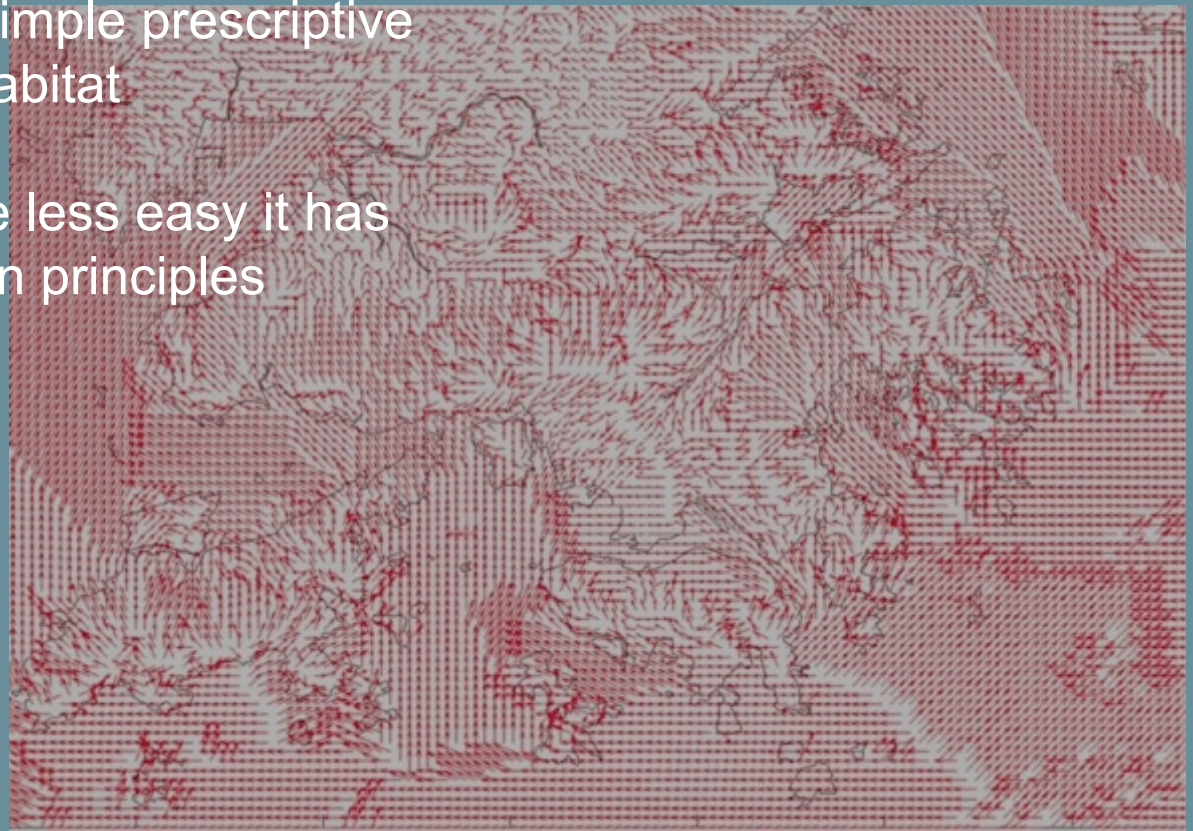
Misinterpreting the science of urban form, density & microclimate

Hilbersheimer looked for simple prescriptive rules to optimise human habitat

But the more we know, the less easy it has become to discern decision principles

for example in relation to:-

urban winds



Learning from the sciences of urban form and climatology

Hilbersheimer looked for simple prescriptive rules to optimise human habitat

But the more we know, the less easy it has become to discern decision principles

for example in relation to:-

urban winds

street width

Learning from the sciences of urban form and climatology

Hilbersheimer looked for simple prescriptive rules to optimise human habitat

But the more we know, the less easy it has become to discern decision principles

for example in relation to:-

urban winds

street width

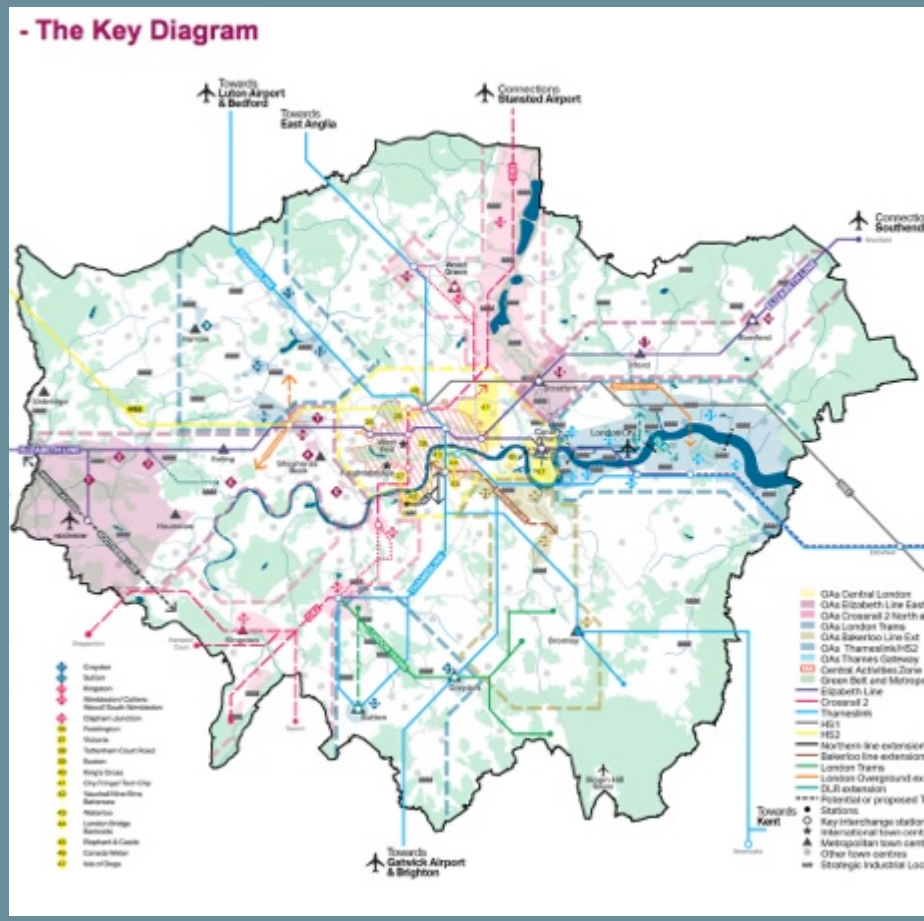
mitigation/adaptation factors

2. How to do it : take-home messages for planners

The Compact City reaffirmed

The special issue starts from policy consensus on the environmental risks of urban sprawl − and the benefits, both for carbon mitigation and for climate change adaptation, of compact form

Particular relevance to London which has pioneered compact city model since conception of the Metropolitan Green Belt in1945



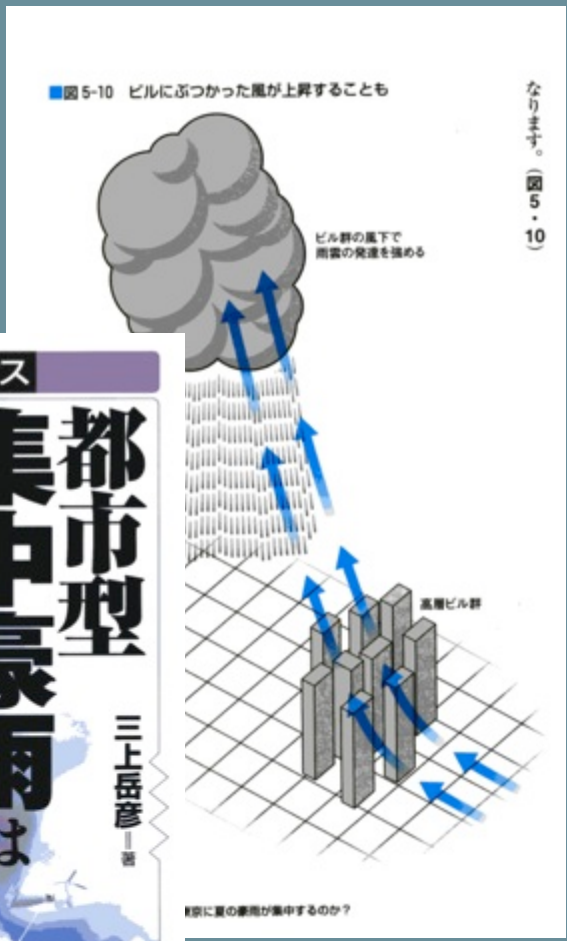
Tall building habit challenged

Godo-Shimizu et al 'Energy use and height in office buildings' : seminal findings derived from an empirical study of actual enery consumption in a large sample of office buildings

Tall building habit challenged

an important contribution from the energy calculus to a debate that already involves considerations of

- townscape
- heritage
- shadowing
- overlooking
- infrastructure loadings
- climatic impacts
- land values
- blight . . .



Tall building habit challenged

energy calculus provides opportune response to the architectural fashion for 'green towers' − an intrinsically absurd building type

a utopian by-product of digital design environments

dystopian in real-world implementation

Knowledge base refreshed

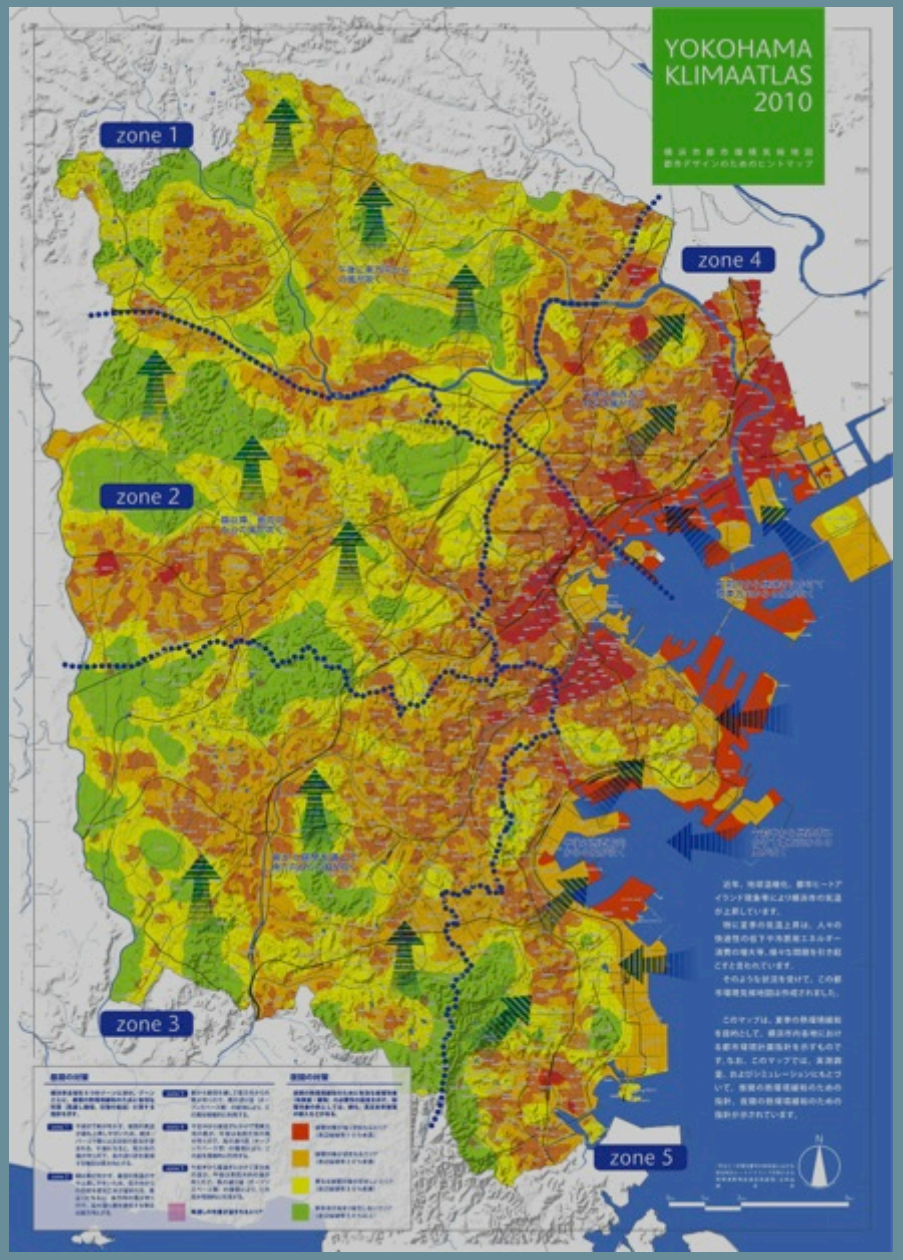
potential contributions at the two scales of enviornmental assessment most used in town planning

a) *Klimaatlas*-type mapping, intended to set parameters for detailed design:

UTCs
SVF
morphometrics

b) project-specific assessments

MAGIC



Regulatory tools need sharpening

climate crisis requires urgent response at urban scale

planning policy frameworks and regulatory tools were designed for twentieth century conditions

may not be adequate to present challenges

see ICLEI, C40, IPCC

3. Conclusion

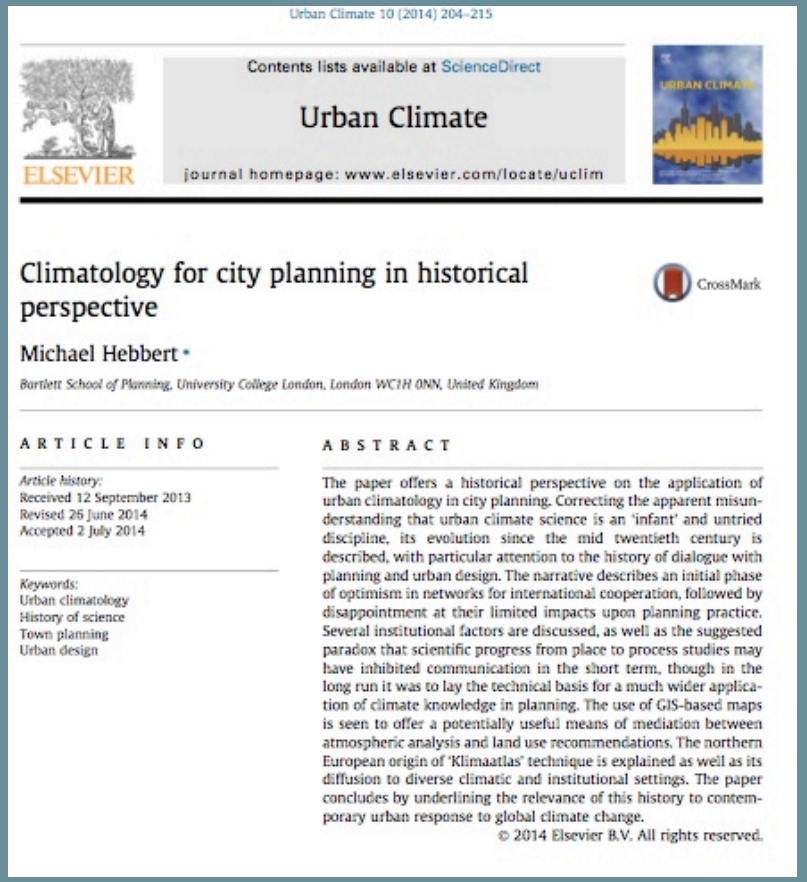
Knowledge flow between urban climatology and urban planning remains very limited

mutual incomprehension exists between hard science and public policy

always asier to tick the environmental box by adding 'greenspace'

vital, urgent need to base our urbanism in atmospheric and energy science

We are indeed on the edge . . .



Urban Climate 10 (2014) 204–215

Contents lists available at ScienceDirect

Urban Climate

journal homepage: www.elsevier.com/locate/uclim

Climatology for city planning in historical perspective

Michael Hebbert *

Bartlett School of Planning, University College London, London WC1H 0NN, United Kingdom

ARTICLE INFO

Article history:
Received 12 September 2013
Revised 26 June 2014
Accepted 2 July 2014

Keywords:
Urban climatology
History of science
Town planning
Urban design

ABSTRACT

The paper offers a historical perspective on the application of urban climatology in city planning. Correcting the apparent misunderstanding that urban climate science is an 'infant' and untried discipline, its evolution since the mid twentieth century is described, with particular attention to the history of dialogue with planning and urban design. The narrative describes an initial phase of optimism in networks for international cooperation, followed by disappointment at their limited impacts upon planning practice. Several institutional factors are discussed, as well as the suggested paradox that scientific progress from place to process studies may have inhibited communication in the short term, though in the long run it was to lay the technical basis for a much wider application of climate knowledge in planning. The use of GIS-based maps is seen to offer a potentially useful means of mediation between atmospheric analysis and land use recommendations. The northern European origin of 'Klimaatlas' technique is explained as well as its diffusion to diverse climatic and institutional settings. The paper concludes by underlining the relevance of this history to contemporary urban response to global climate change.