



Urban cartography

Mapping as a tool for
investigating cities

MORPHOCODE

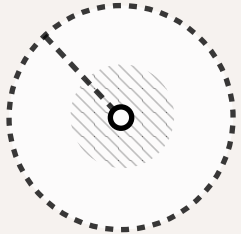


Table of Contents

Introduction 03

The figure ground map of Rome 05

John Snow’s map of cholera 07

Charles Booth’s poverty maps 10

Hull House maps and papers 13

W.E.B. Du Bois Philadelphia studies 17

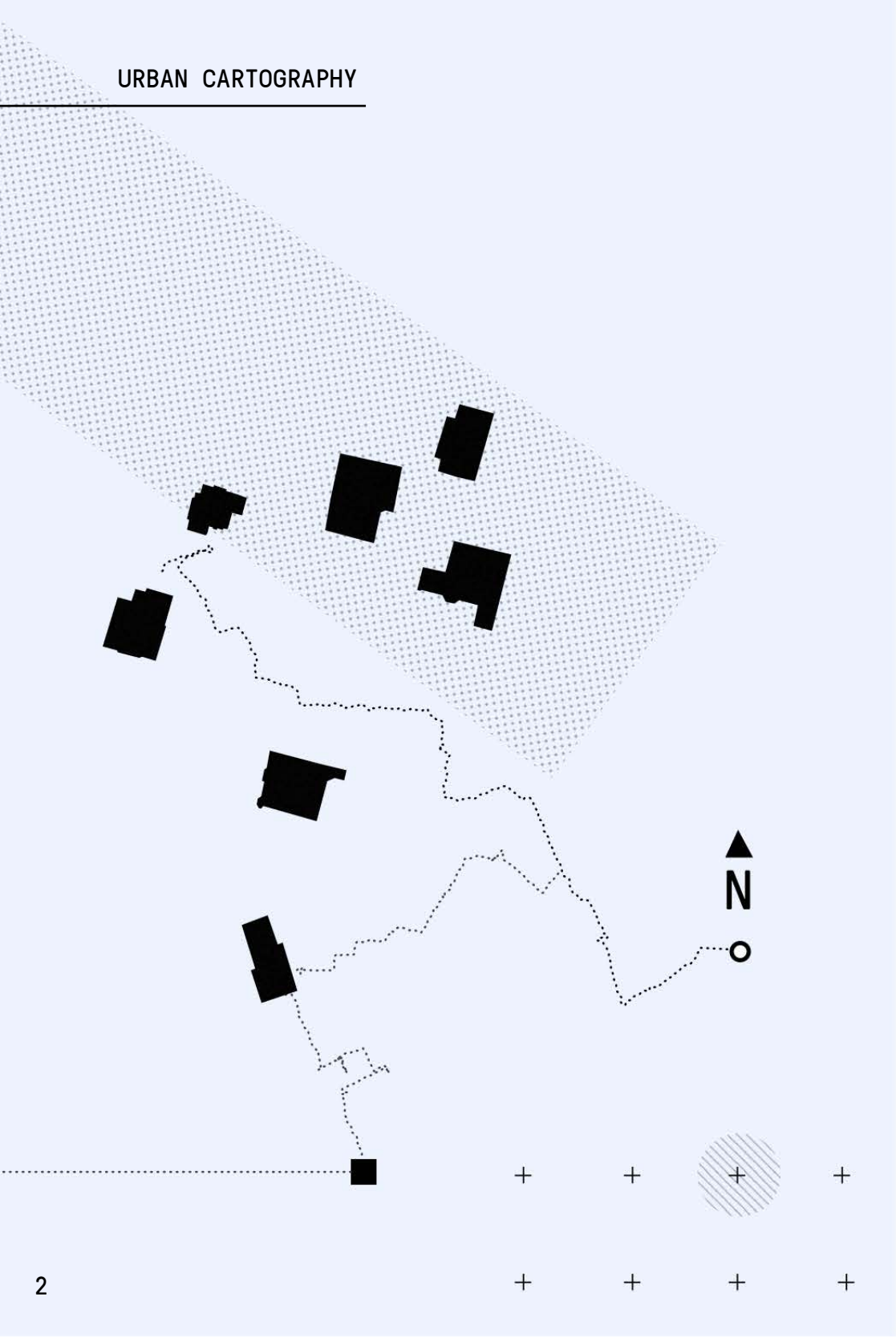
The Sanborn Fire Insurance Maps 21

Chicago's Gangland 26

London Bomb Damage Maps 29

Children’s automobile accidents 32

Urban Atlas: 20 American Cities 35



Introduction

This ebook presents a collection of pioneering works in the domain of urban cartography. Some of the selected maps deal with various social problems like public health, poverty, and crime. Others are focused on the built environment or explore new data visualization techniques.

They all demonstrate the power of mapping as a tool for investigating the spatial organization of society and as a means to solve complex urban problems.

From the nineteenth century onward, innovations in statistical graphics and thematic mapping, along with new printing processes, allowed researchers to document urban patterns in new ways. As cities grew, mapping became a popular method for the display of survey or census data.

Take a closer look at some of the best cartographic examples from the past to learn how they conveyed spatial data and used it to impact pressing social issues.

“

Maps are not just analytical tools. They are visual arguments that contain and convey political statements, meaning, and power.

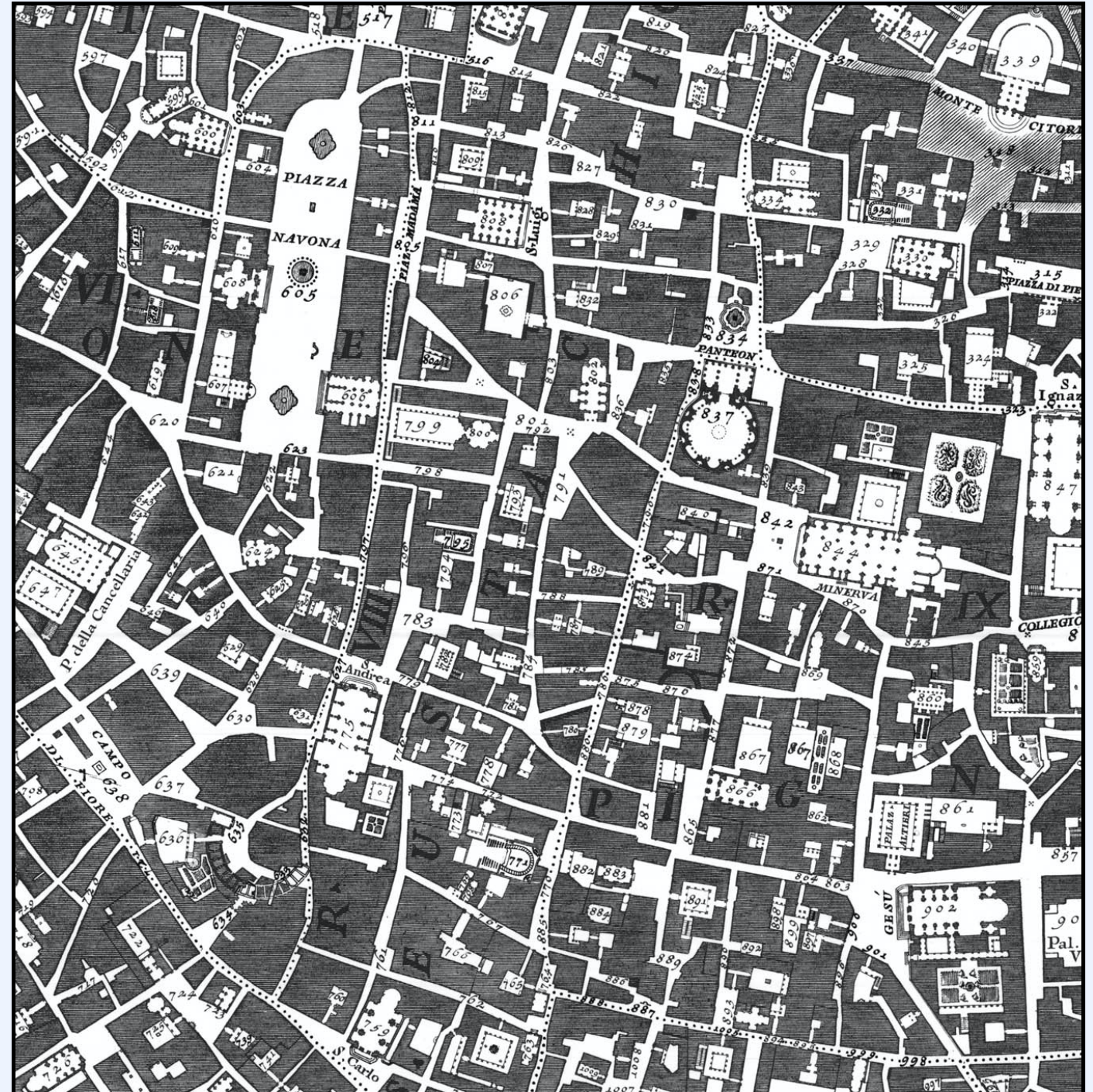
Kari S. McLeod

Our sense of Snow: the myth of John Snow in medical geography

1. The figure-ground map of Rome

A figure-ground diagram is a mapping technique used to illustrate the relationship between built and unbuilt space in cities. Land coverage of buildings is visualized as solid mass (figure), while public spaces formed by streets, parks, and plazas are represented as voids (ground).

One of the best-known examples of a figure-ground map is Giambattista Nolli's 1748 "Pianta Grande di Roma." In urban planning, this simple yet powerful graphic tool is used to explore built form patterns and the continuity of open space.





URBAN CARTOGRAPHY

The New Plan
of Rome by
Giambattista
Nolli. Plate 5/12

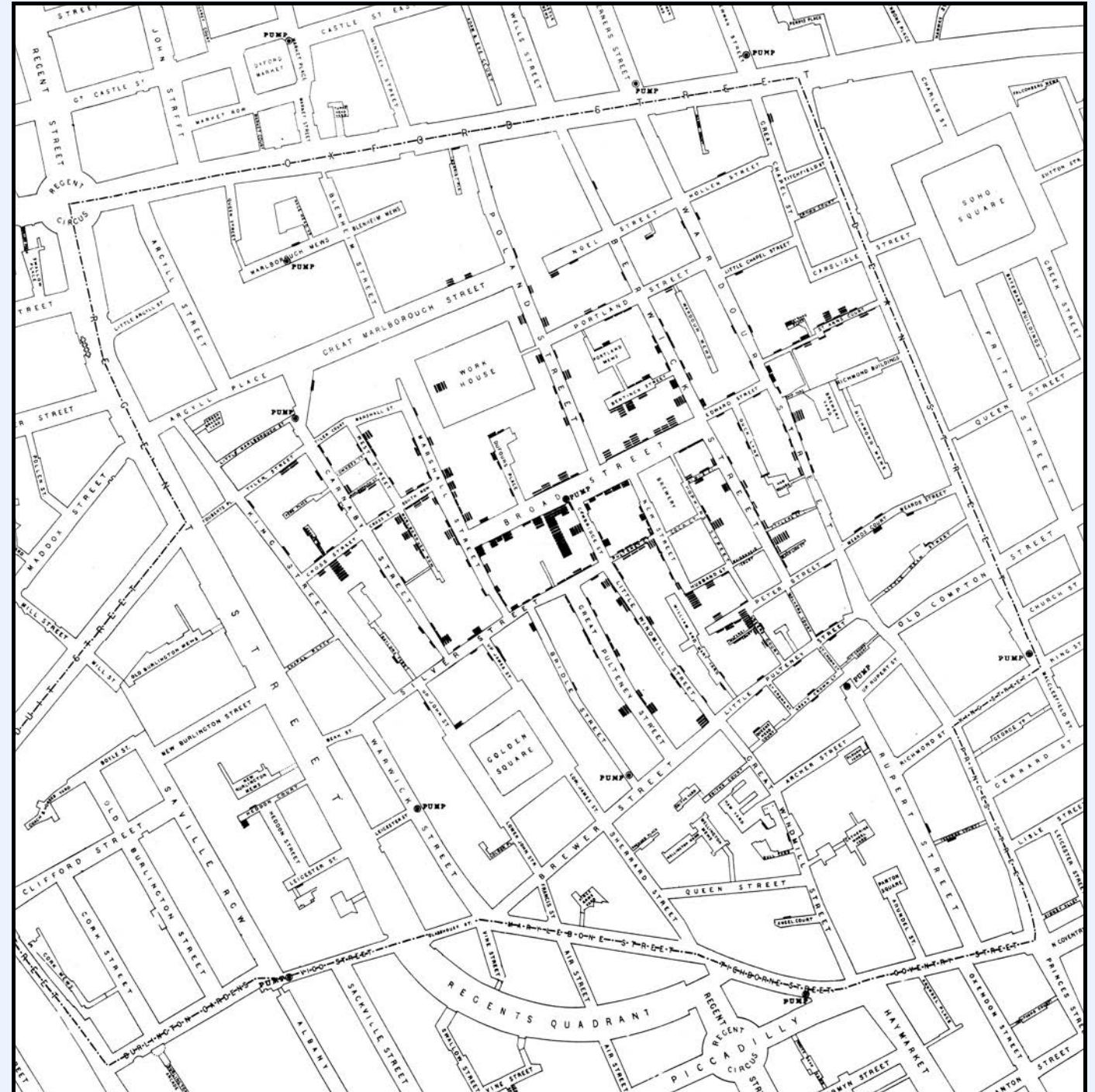
La Pianta Grande is a milestone in urban cartography. It allows the viewer to explore the intricate build patterns of eighteenth-century Rome, as well as the system of open spaces that a pedestrian would experience while moving through the city.

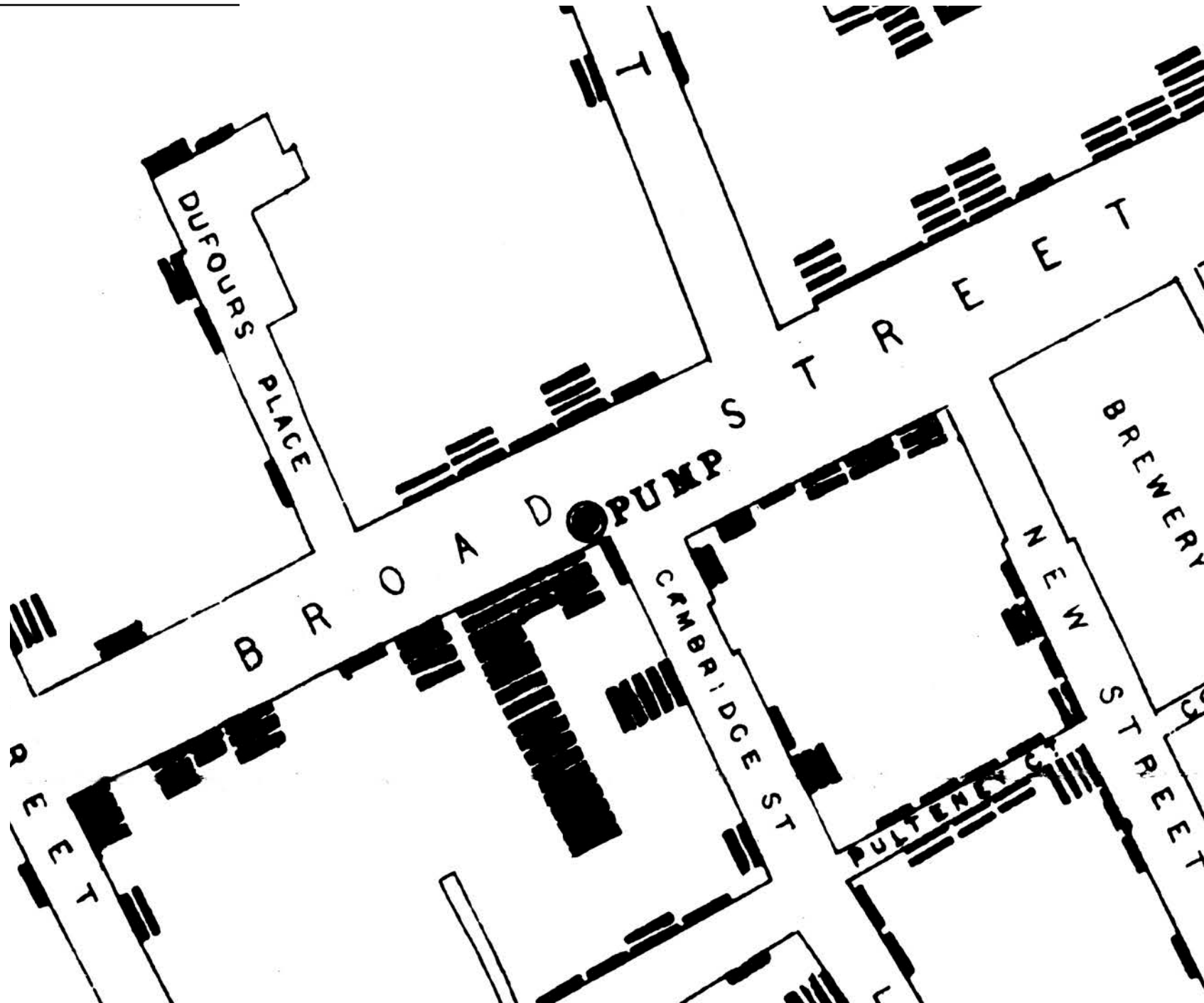
Nolli's map features ground-level plans of over 2000 publicly accessible buildings. Up until the 1970s, the plan provided a base for other maps of the city. It is still one of the best sources of information for studying the historical core of Rome.

2. John Snow's map of cholera outbreaks

In 1854, a massive cholera outbreak in London's Soho district took the lives of over 600 people. The following year, dr. John Snow published his study "On the Mode of Communication of Cholera." He insisted that cholera was a water-borne disease rather than airborne.

After he meticulously collected data, Snow drew "*a diagram of the topography of the outbreak*," mapping the number of deaths in proximity to a local water pump. His map was convincing enough to persuade local authorities to remove the pump handle in an attempt to avoid further transmission of the disease.





It remains unclear if the removal of the pump handle is the real reason for the containment of the disease. The number of reported deaths was already declining before this intervention.

However, John Snow's groundbreaking studies of the spatial patterns of cholera's transmission illustrate the power of cartography and statistical methods. His contribution to medical cartography was widely acknowledged, and he became known as "the father of epidemiology."

Detail from John Snow's 1854 map of cholera outbreak on Broad Street

“

Among the most famous examples of social cartography are John Snow's maps of cholera in London and, from later in the 19th c., Charles Booth's maps of poverty.

Laura Vaughan

Mapping Society: The Spatial Dimensions of Social Cartography

3. Charles Booth's poverty maps

Inquiry into the Life and Labour of the People in London is a large scale social study undertaken by Charles Booth and his team of researchers between 1886 and 1903. It took fifteen years to finally publish the last edition of the survey, comprising the full seventeen volumes.

As part of the study, Booth and his collaborators produced some of the earliest examples of social cartography - a series of maps that revealed the number of people living in poverty. Booth also introduced the concept of the "poverty line" and identified the minimum weekly wages necessary to meet the basic needs of a family.





URBAN CARTOGRAPHY

Map descriptive of
London poverty,
1898-9. Detail from
Sheet 6. West
Central District.

Charles Booth classified poverty in seven distinctive classes and used variation in color to differentiate them on the map. Black was used for the lowest class, dark blue for the very poor, red for the middle class, and yellow for the wealthy upper classes.

To get a better understanding of urban London, Booth's researchers accompanied police officers during their tours around the city. This effort resulted in the so-called *police notebooks* containing detailed descriptions of street life.

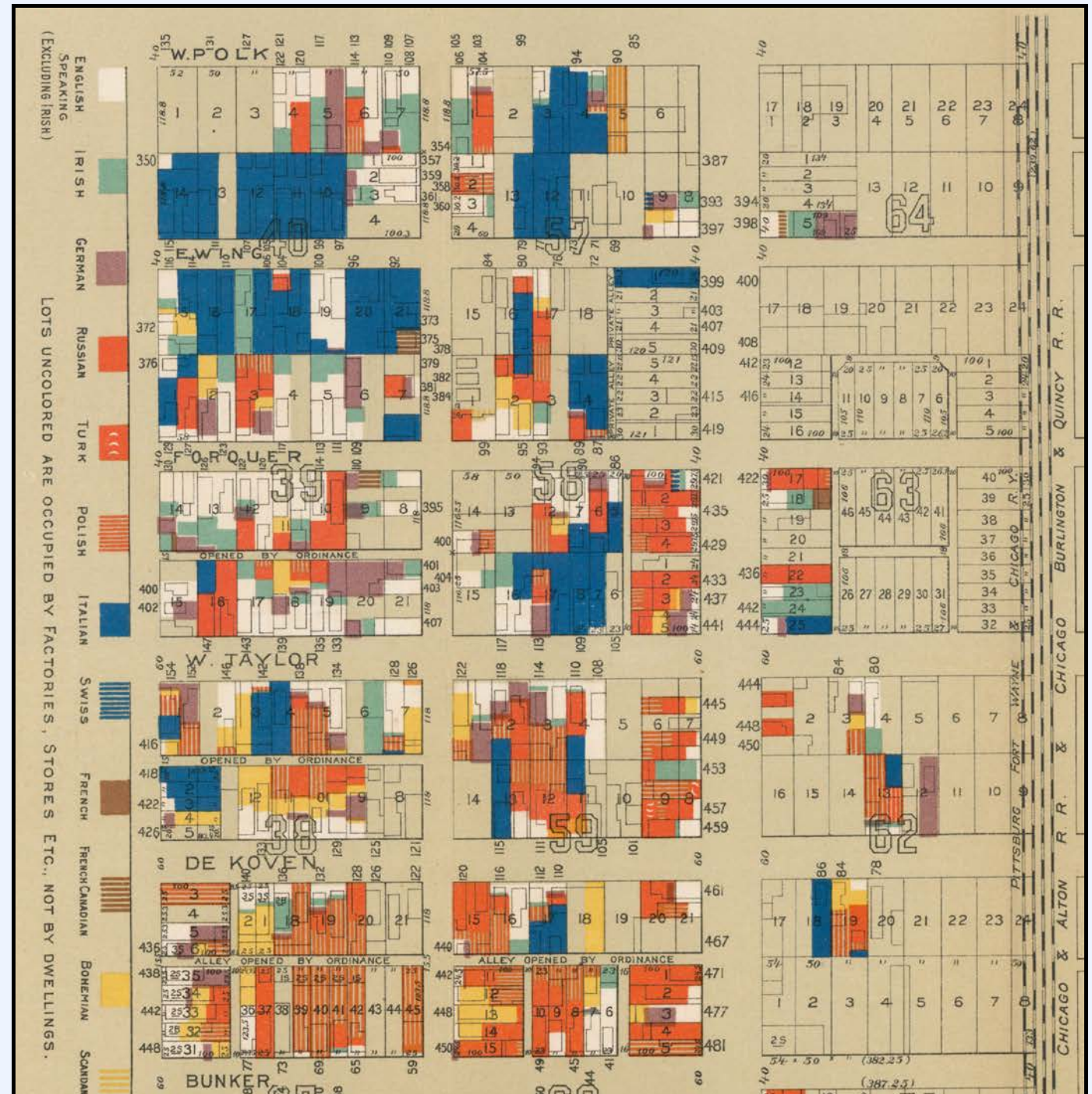
Map
descriptive of
London
poverty by
Charles Booth
(1898-9). Detail
from Sheet 5.
East Central
District.



5. Hull House maps and papers

Hull-House was a settlement house, located on the Near West Side of Chicago. Founded by the social reformer Jane Addams and her colleague Ellen Starr, the settlement provided help and guidance to recent European immigrants. It offered a variety of educational and social opportunities, including free classes and clubs for both children and adults.

In 1893, Hull House participated in a sociological investigation undertaken by the United States Department of Labor, focusing on the conditions in slums in the cities of Baltimore, Chicago, New York, and Philadelphia.

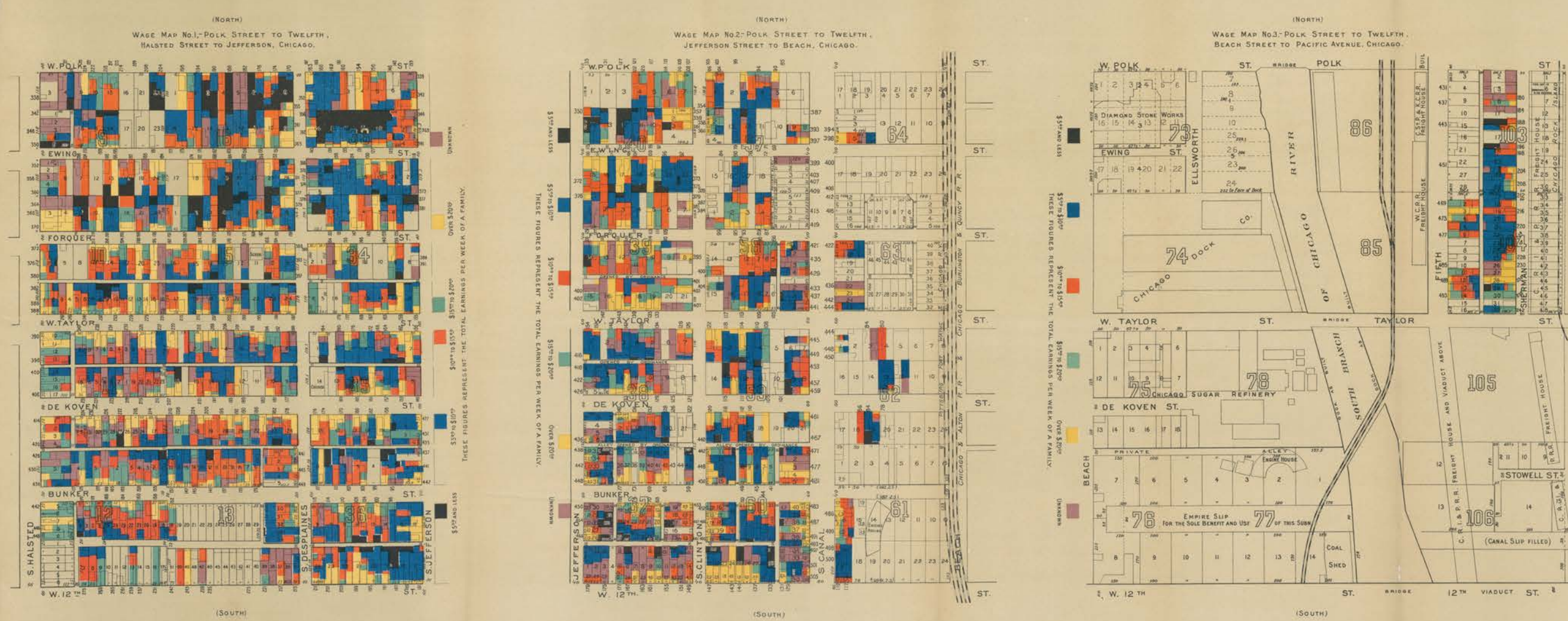


“

These charts, with the street names and house numbers, enable the reader to find any address, the lots being colored to indicate, in one case the birthplace of each individual, in the other the wage of each family.

Agnes Sinclair Holbrook

Hull-House Maps and Papers



URBAN CARTOGRAPHY

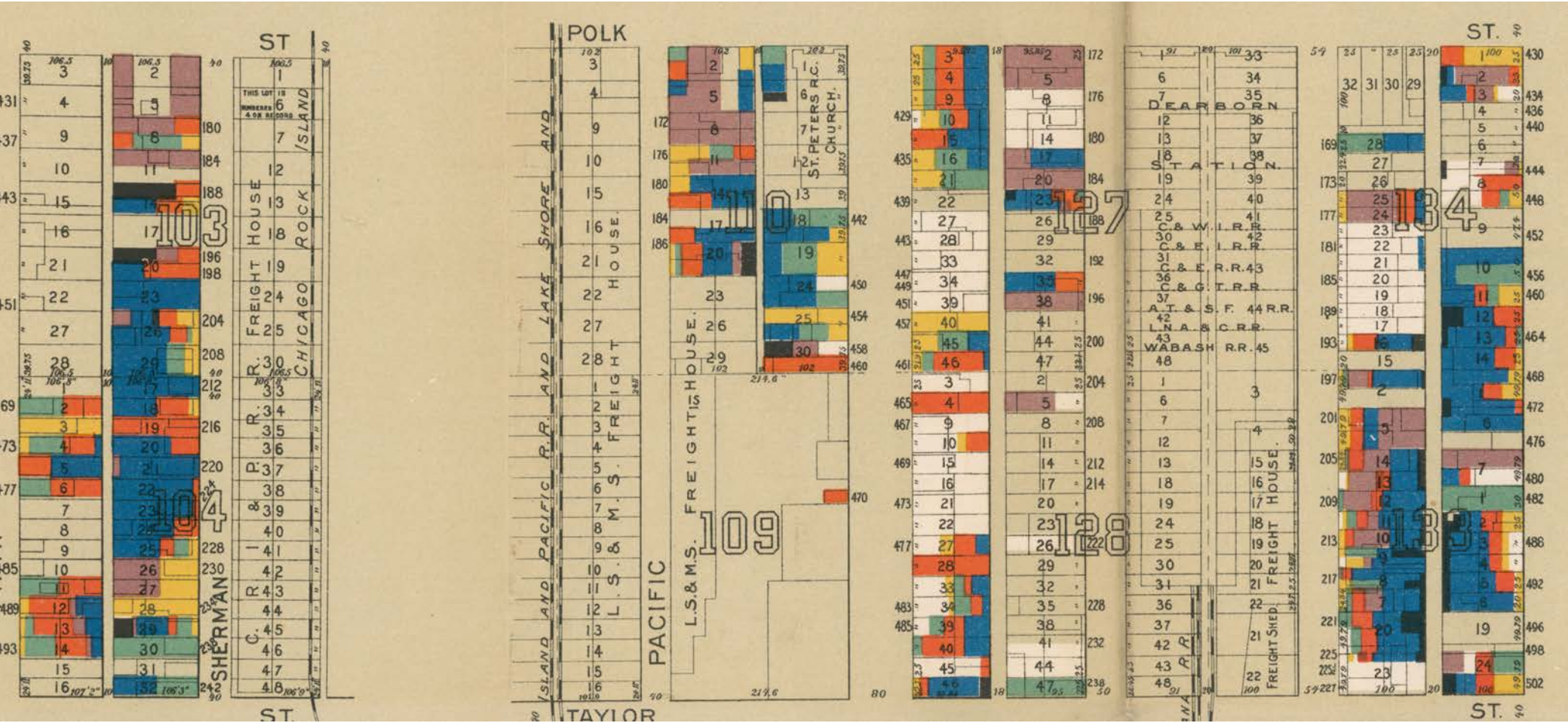
Hull-House Maps and Papers: A Presentation of Nationalities and Wages in a Congested District of Chicago (1895). Wage Map No.1, No.2, and No.3

Hull House Maps and Papers were published in 1895 and contained a series of essays and thematic maps of the neighborhood east of the House. Information for the maps was collected by Florence Kelley, along with a team of collaborators.

For three months, they collected data through questionnaires. Residents were asked to provide information about their ethnic origins, the number of people living in the household, their occupation, average weekly earnings, etc.

The Hull House study of the social conditions in the Chicago district examined how people from different nationalities were distributed spatially and how wages differed across the neighborhood.

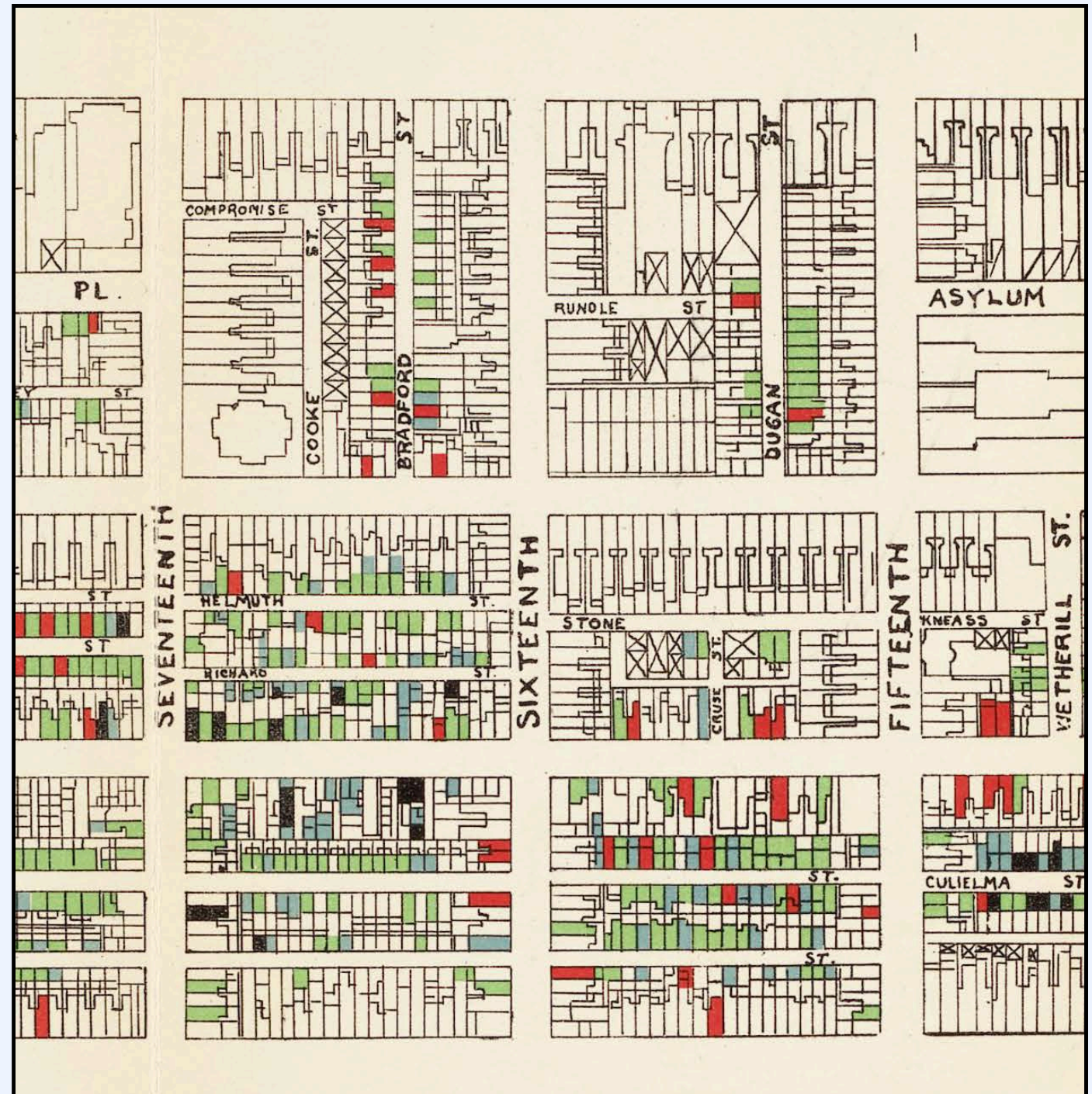
Hull-House Maps and Papers: A Presentation of Nationalities and Wages in a Congested District of Chicago (1895). Wage Map No.2 and No.3 (Detail).



4. W.E.B. Du Bois Philadelphia studies

In 1896, the University of Pennsylvania commissioned W.E.B. Du Bois to study the living conditions of African Americans in Philadelphia. The findings of the research were eventually published under the title "The Philadelphia Negro." The extensive, 560-page sociological survey is the first case study of a black community in the United States.

W.E.B. Du Bois is considered one of the founders of urban sociology. He was also a prominent civil rights activist and the first African American to earn a Ph.D. from Harvard University.

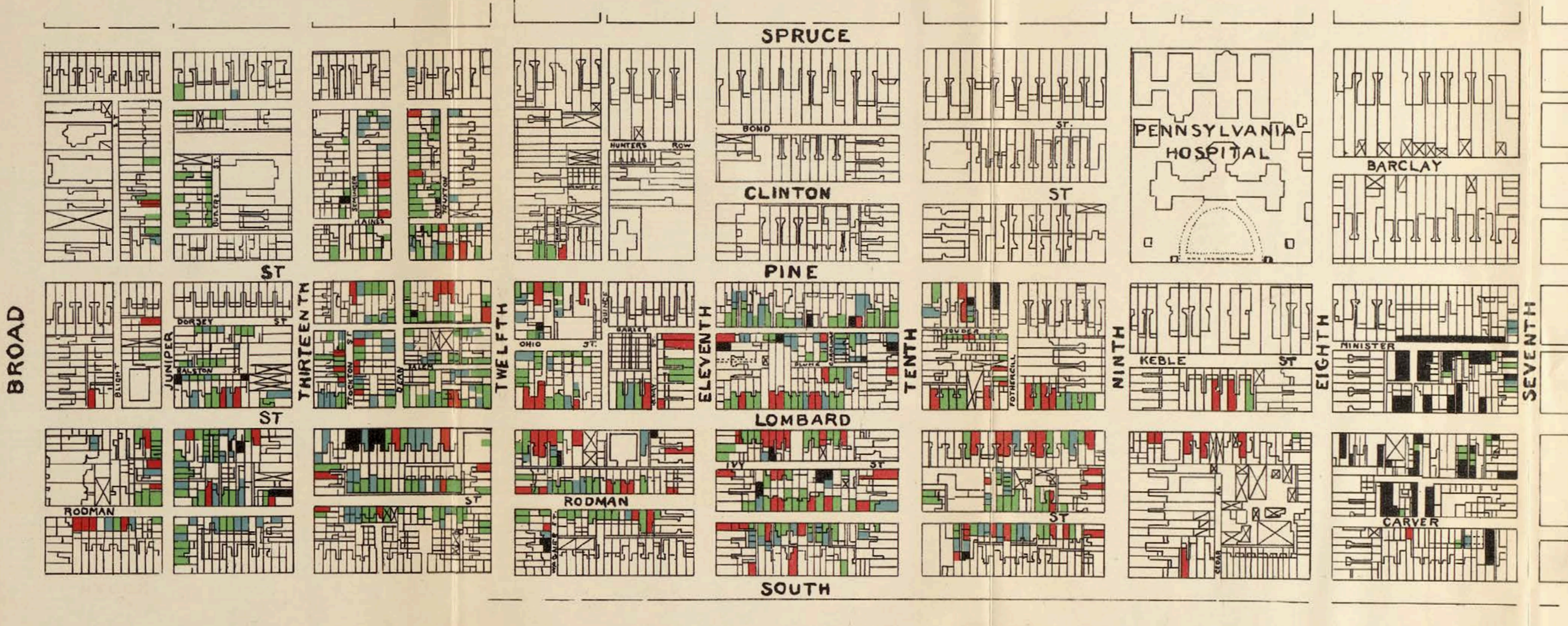


“

One never knows when one sees a social outcast how far this failure to survive is due to the deficiencies of the individual, and how far to the accidents or injustice of his environment.

W.E.B. Du Bois

The Philadelphia Negro



URBAN CARTOGRAPHY

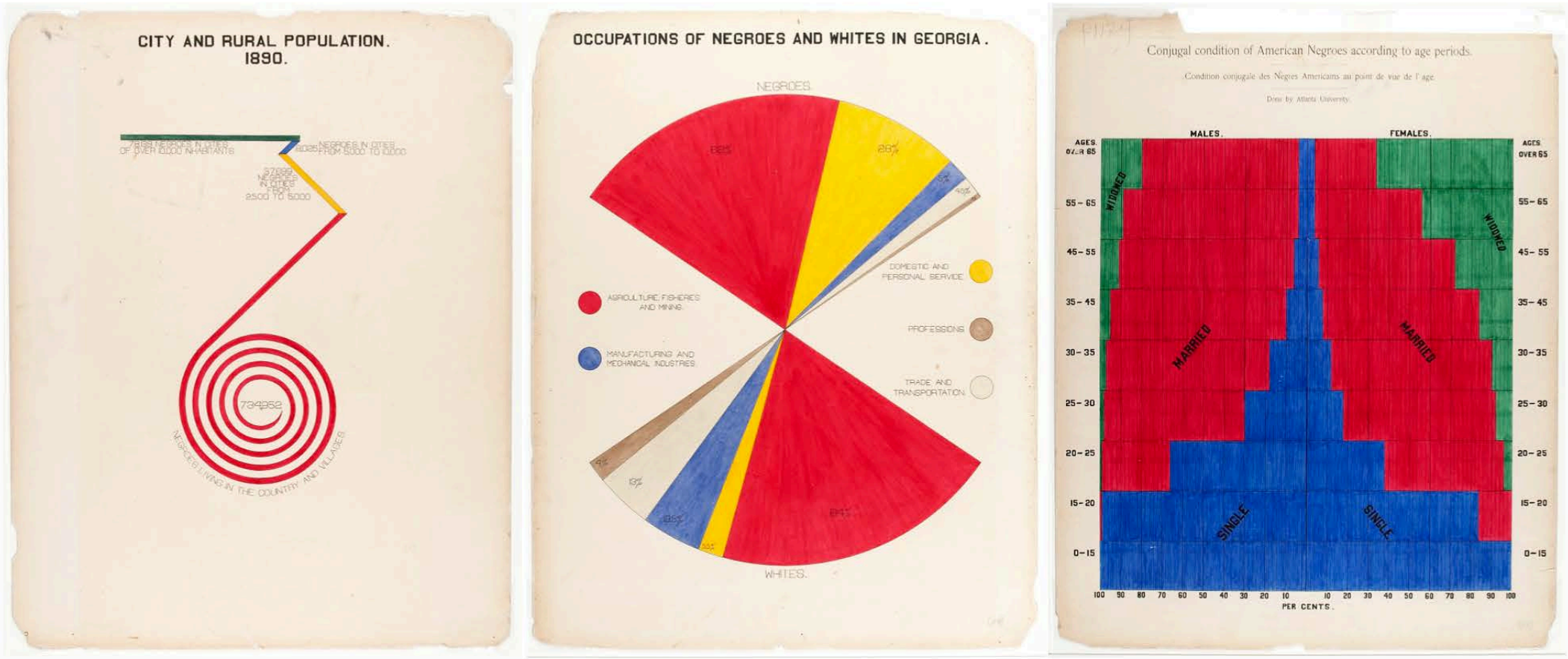
The Seventh Ward of Philadelphia. "The Distribution of Negro Inhabitants Throughout the Ward, and their social condition." W.E.B. Du Bois (1899)

Du Bois focused his sociological study on the Seventh Ward in Philadelphia - a historically black community. He collected data on 9675 African Americans in order to investigate pressing social problems of poverty, ignorance, crime, and labor.

He defined four types of social conditions. Red represents the middle class and those above, green designates those living in "fair and comfortable" conditions, blue represents the poor, and black is the color of "vicious and criminal classes."

In 1900, Du Bois participated in The Exposition Universelle in Paris. "The Exhibit of American Negroes" featured numerous maps and plans, along with 32 charts and 500 photographs, all illustrating the problem of "the color line" at the turn of the century.

The exhibit presented two sets of charts - one illustrating conditions in the entire United States and the other conditions in the State of Georgia, that had the largest African American population.



6. The Sanborn Fire Insurance Maps

The Sanborn Fire Insurance Maps provided detailed information about the built environment of over 12,000 U.S. cities and towns throughout the 19th and 20th centuries. The maps conveyed data about property boundaries, building size and use, as well as construction materials.

Sanborn's extensive map collection allowed insurance companies to assess their liability and evaluate potential fire hazard risk for individual properties.



“

Fire insurance maps are distinctive because of the sophisticated set of symbols that allows complex information to be conveyed clearly.

Library of Congress

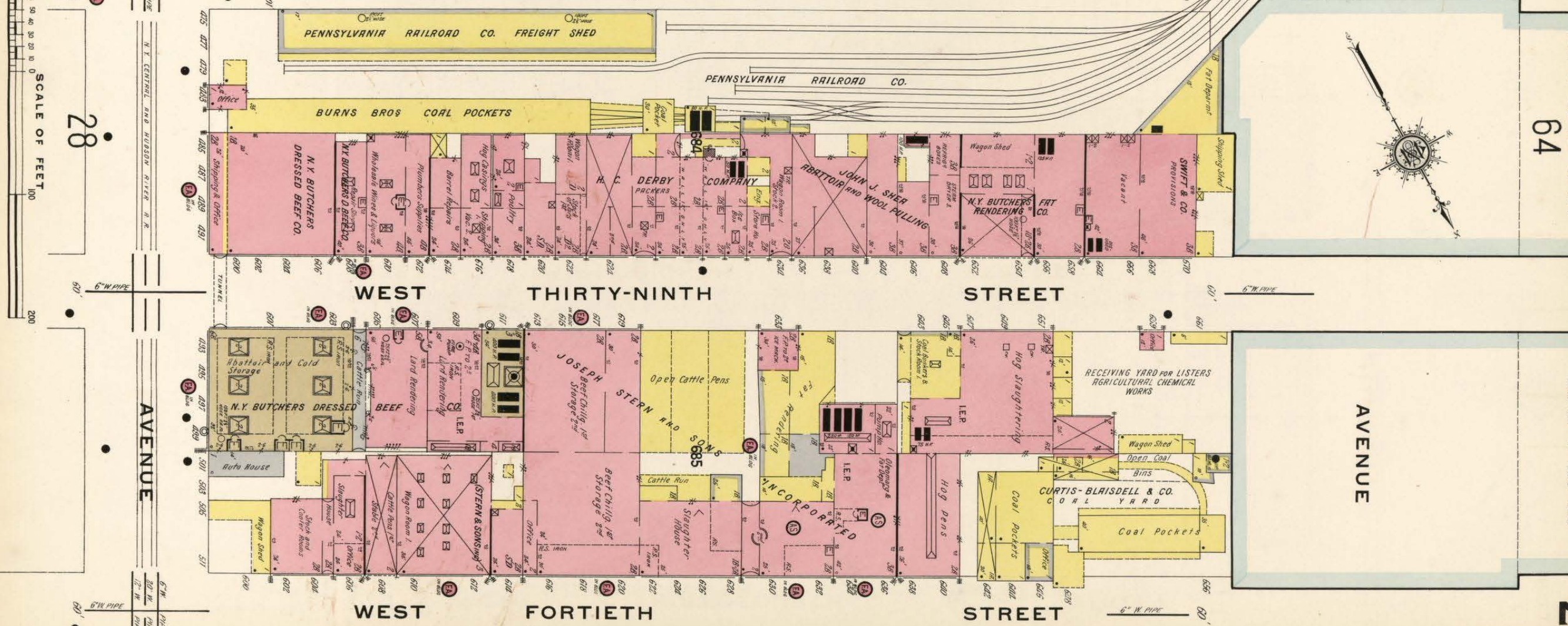
Sanborn Keys, Legends, and Symbol Sheets

The company's surveyors used different colors and a sophisticated set of symbols to convey information about every building and its construction.

Sanborn maps were produced from field surveys following a set of predefined color-coding techniques, symbols, and line types.

KEY	
TILE 1ST BRICK 1ST PYROBAR 1ST	Fire proof construction. (OR FIRE RESISTIVE CONST'N)
ADOB	Adobe building.
HEIGHT OF BUILDING IN FEET FROM GROUND TO ROOF LINE.	Stone building.
(C. BR.)	Concrete, lime, cinder or cement brick
(C. B.)	Hollow concrete or cement block const'n
(CONC.)	Concrete or reinforced concrete const'n
(TILE)	Tile building.
NUMBER OF STORIES 4	Brick building with frame cornice.
TWO STORIES AND BSMT 28 COMPOSITION ROOF	" " " stone front.
SHINGLE ROOF X	" " " frame side. (DIVIDED BY FRAME PARTITION)
(VEND)	Brick veneered building.
BRICK 1ST	" and frame building.
FRAME, BRICK LINED	Frame building, brick lined.
F=FLAT S=STORE	" " metal clad.
D=DWELLING	Frame building.
A in B AUTO IN BSMT	Iron building.
LOFT	Tenant building occupied by various manufacturing or occupancies
(ASB. CL.)	Frame building covered with asbestos
NON COMBUSTIBLE ROOF COVERING OF METAL, SLATE, TILE OR ASBESTOS SHINGLES	Brick building with brick or metal cornice.

78' 5	Height of Buildings, in Stories and feet (74 ft. 6 in. and over).
	Fronts of marble or other stone.
	Iron Fronts.
	" Dotted line." Interior brick wall, omitted on one or more floors.
S	Superior construction. { Built of non-inflammable material " throughout ," except flooring and trim.
1,2. 1-4	Communications protected by single fire-proof doors { With designation " " " double " " of floors.
X X IRON NONE SHUTTERS.	Openings exposing Buildings.
E	Elevators with steam or other power. { Where enclosed with Brick or Fire-proof material a heavy line is drawn around them.
X	Hatchways or "Dumb-waiters."
	Sky-lights in Roof only.
	" over Opening in floor.
	Smoke-houses. Retorts, and Ovens.
IRON. FRAME.	Mansard Roofs. Corrugated Iron. Steam-boilers.



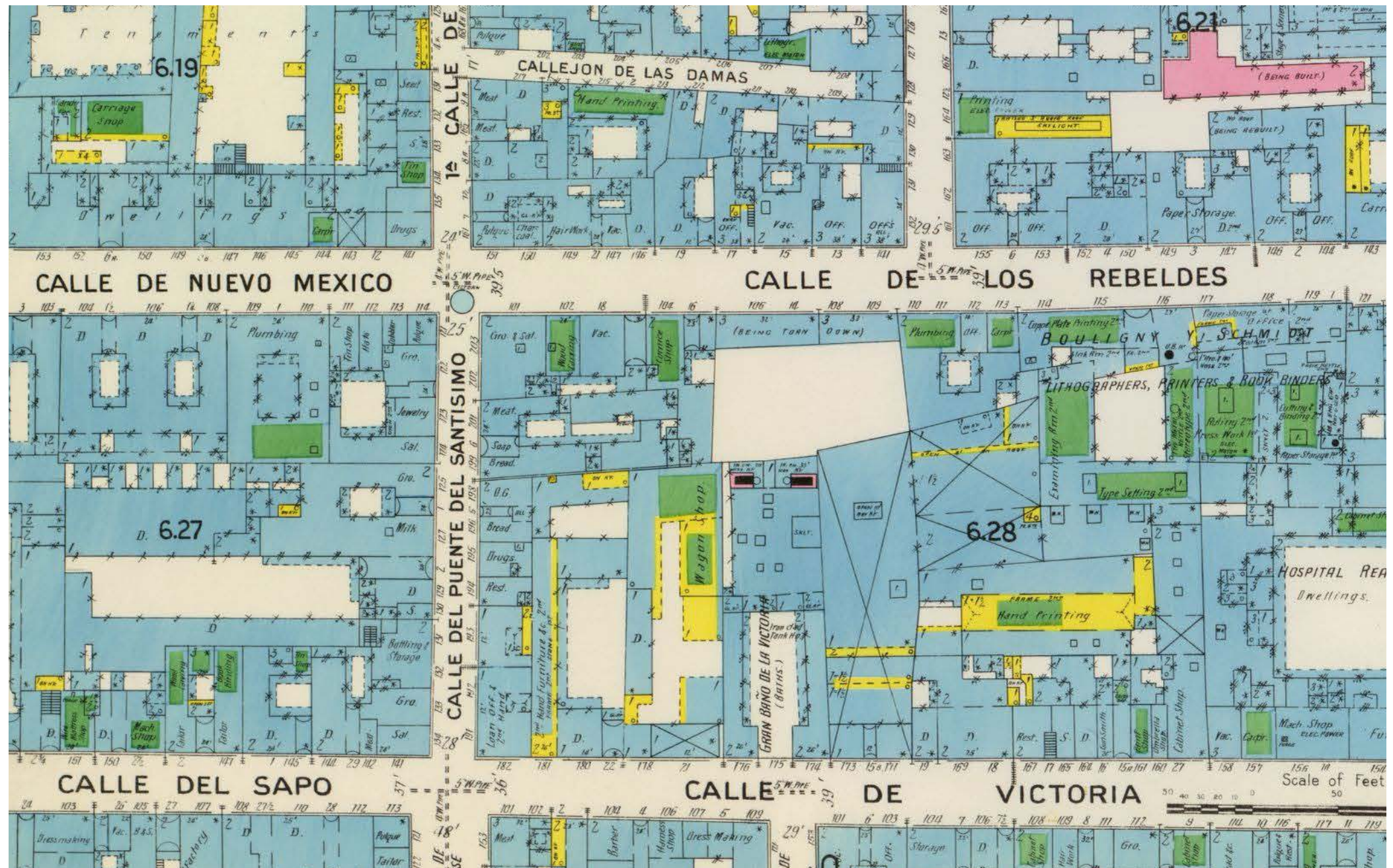
URBAN CARTOGRAPHY

Image 160 of
Sanborn Fire
Insurance Map from
New York, Bronx,
Manhattan, New
York. (Vol. 5, 1911)

To ensure a high level of accuracy and consistent graphical presentation, the company published a Surveyors' Manual in 1905. It included "more than a hundred pages of precise instructions" and sample maps for the exclusive use of its employees.

Today, the Sanborn maps allow researchers to explore urban growth patterns and changes in land use over time. As the collection provides access to building footprints data for all major urbanized areas in the U.S., its historical value is unprecedented.

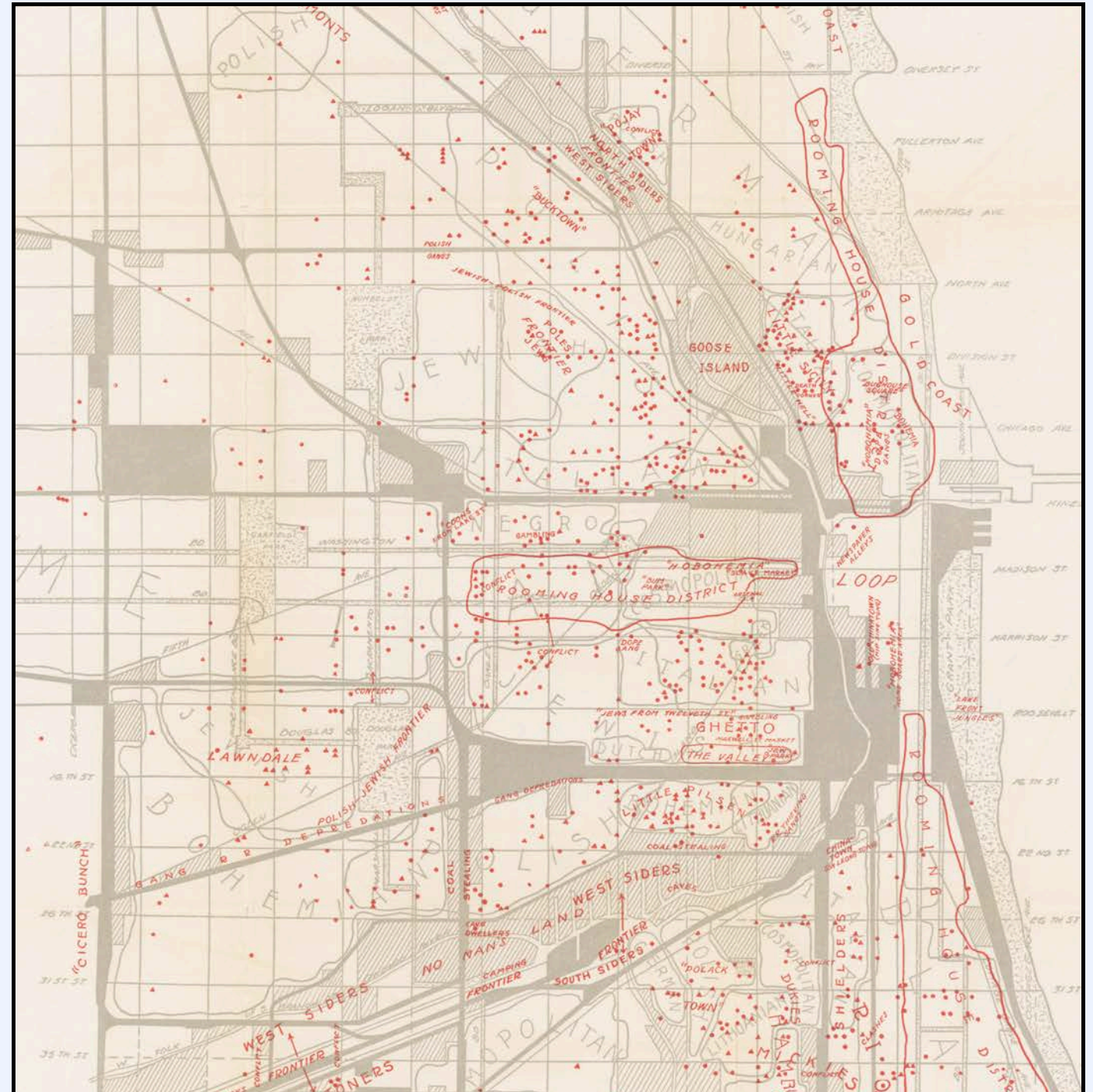
Sanborn Fire Insurance Map from Mexico City, Federal District, Distrito Federal. Detail from image N9. Published by Sanborn Map Company in 1905



7. Chicago's Gangland

Frederic M. Trasher's exploratory survey *"The Gang: A study of 1313 gangs in Chicago"* is a modern classic and part of the legacy of Chicago School of Sociology. It was published in 1927, but the data collection process took seven years. Trasher drew information from various sources, including census and court records, as well as personal observation from on-site explorations.

The accompanying map illustrates the spatial distribution of Chicago's gangs in the 1920s and supports Trasher's conclusion that "gangland represents a geographically and socially interstitial area in the city."



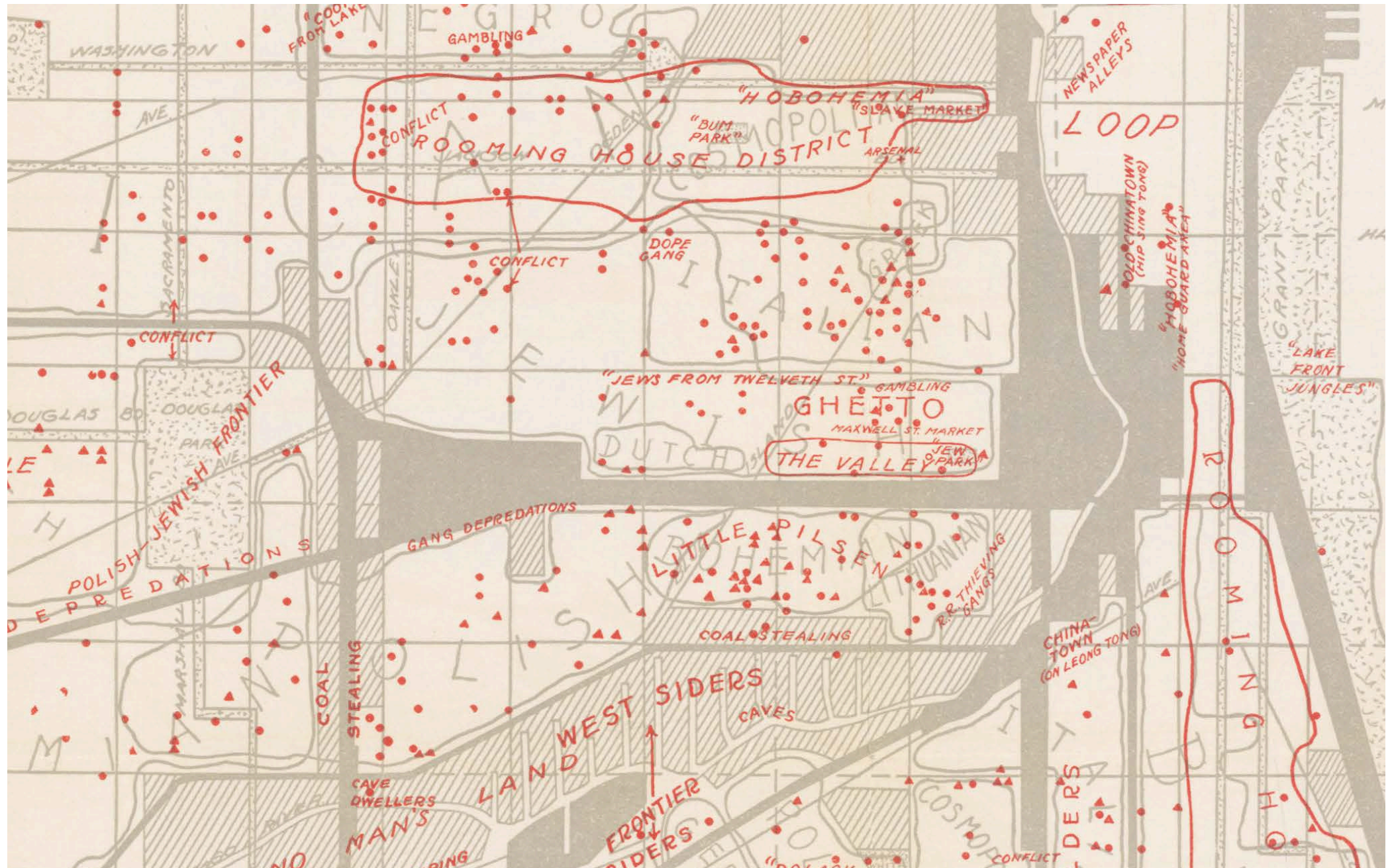
“

The gang may be regarded as an interstitial element in the framework of society, and gangland as an interstitial region in the layout of the city.

Frederic M. Trasher

The Gang: A study of 1313 gangs in Chicago

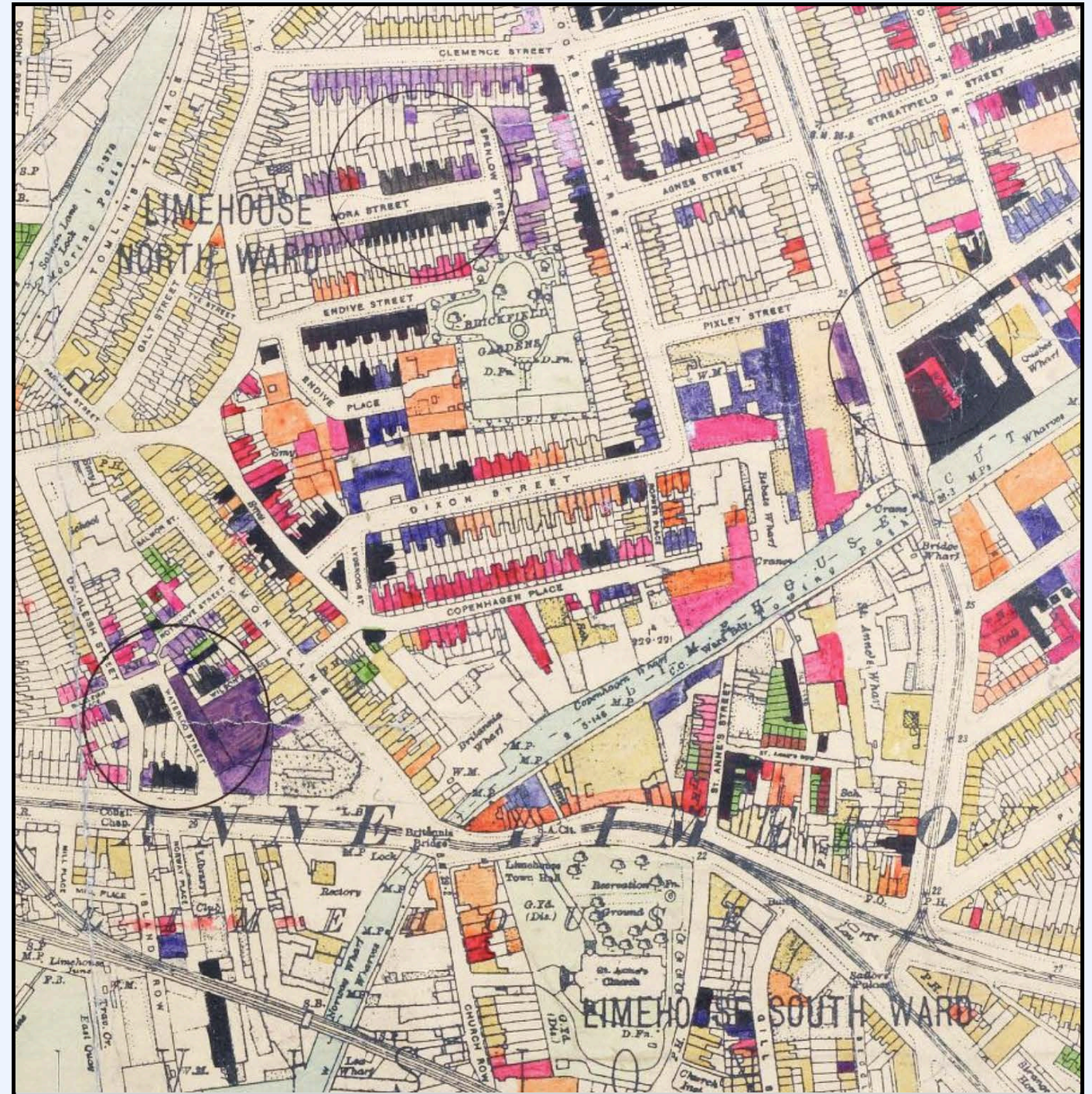
Chicago's
Gangland
exploratory
study by
Frederic M.
Trasher is part
of the legacy of
Chicago
School of
Sociology.



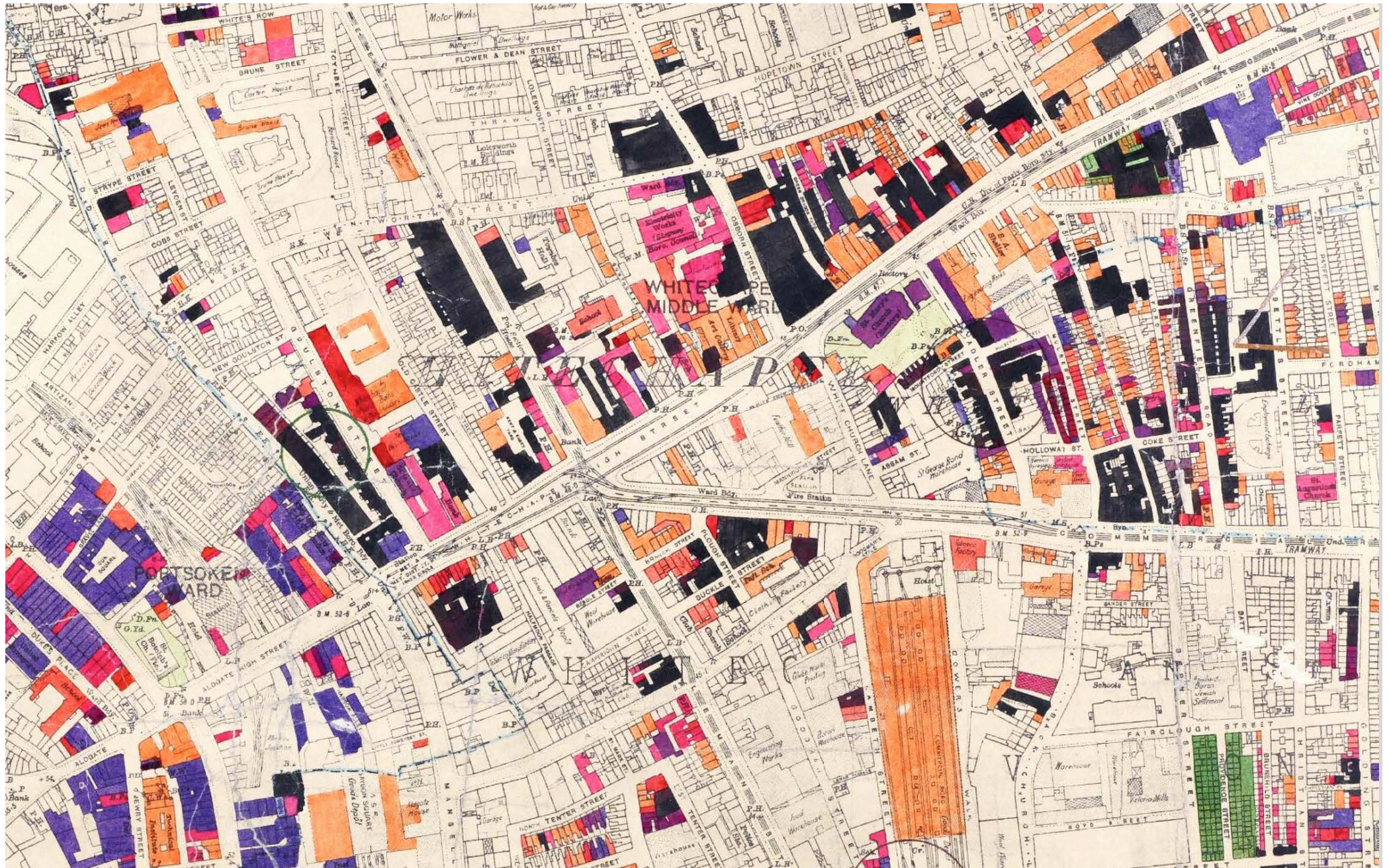
8. London Bomb Damage Maps

The London County Council Bomb Damage Maps is a collection of 110 hand-colored maps that document the extent of the destruction the city suffered during WWII aerial bombardments. More than a million houses were destroyed or damaged.

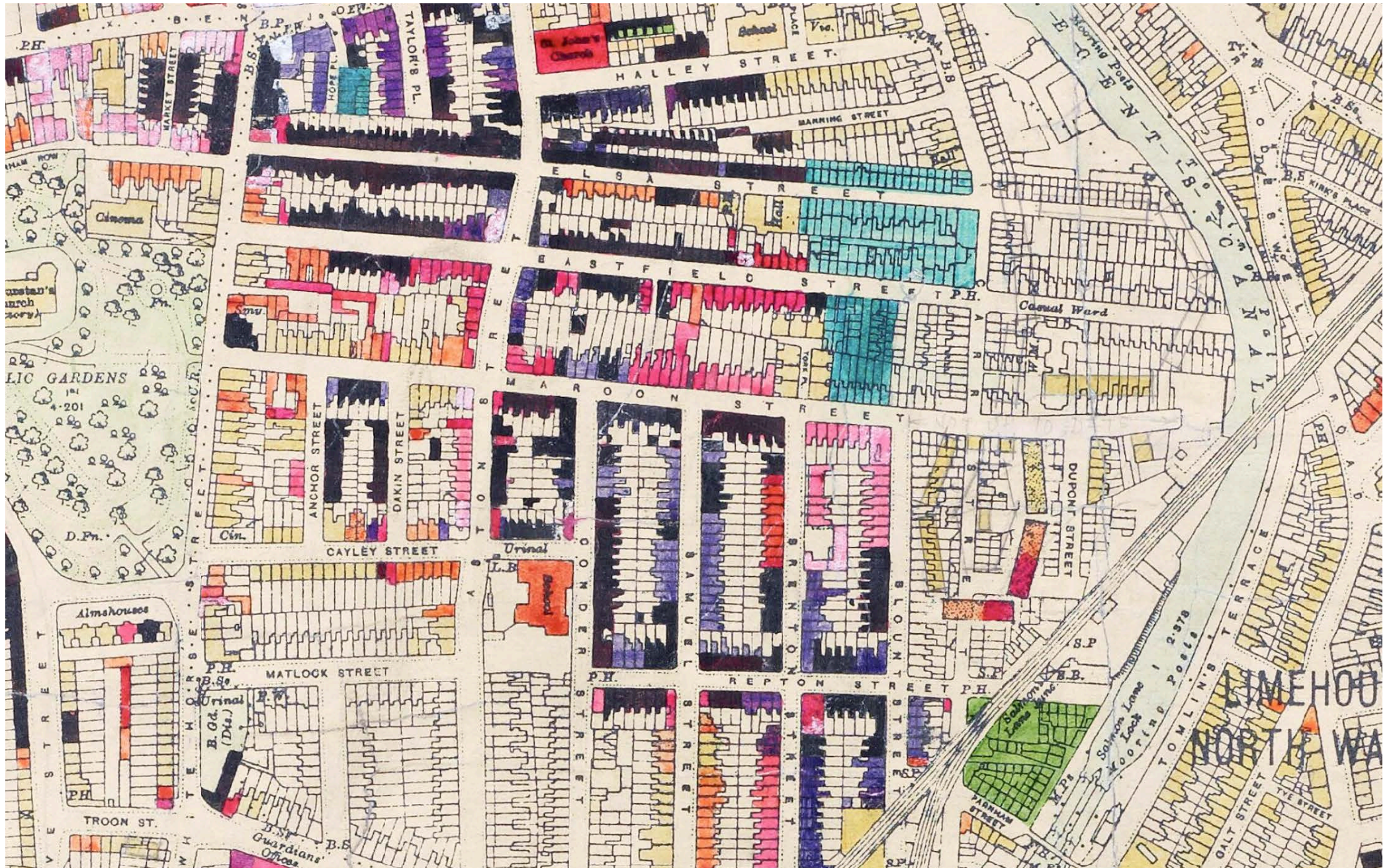
The maps include V1 and V2 bomb locations and a building classification ranging from Total Destruction (Black), through Seriously Damaged (Dark Red) to Clearance Areas (Green). This detailed survey of the built environment in London during The Blitz is an important record of staggering destruction.



London
County
Council Bomb
Damage Maps for the City,
Whitechapel,
Holborn and
Bloomsbury
(1945). Detail
from sheet 63
covering City
of London
(East) and
Whitechapel.



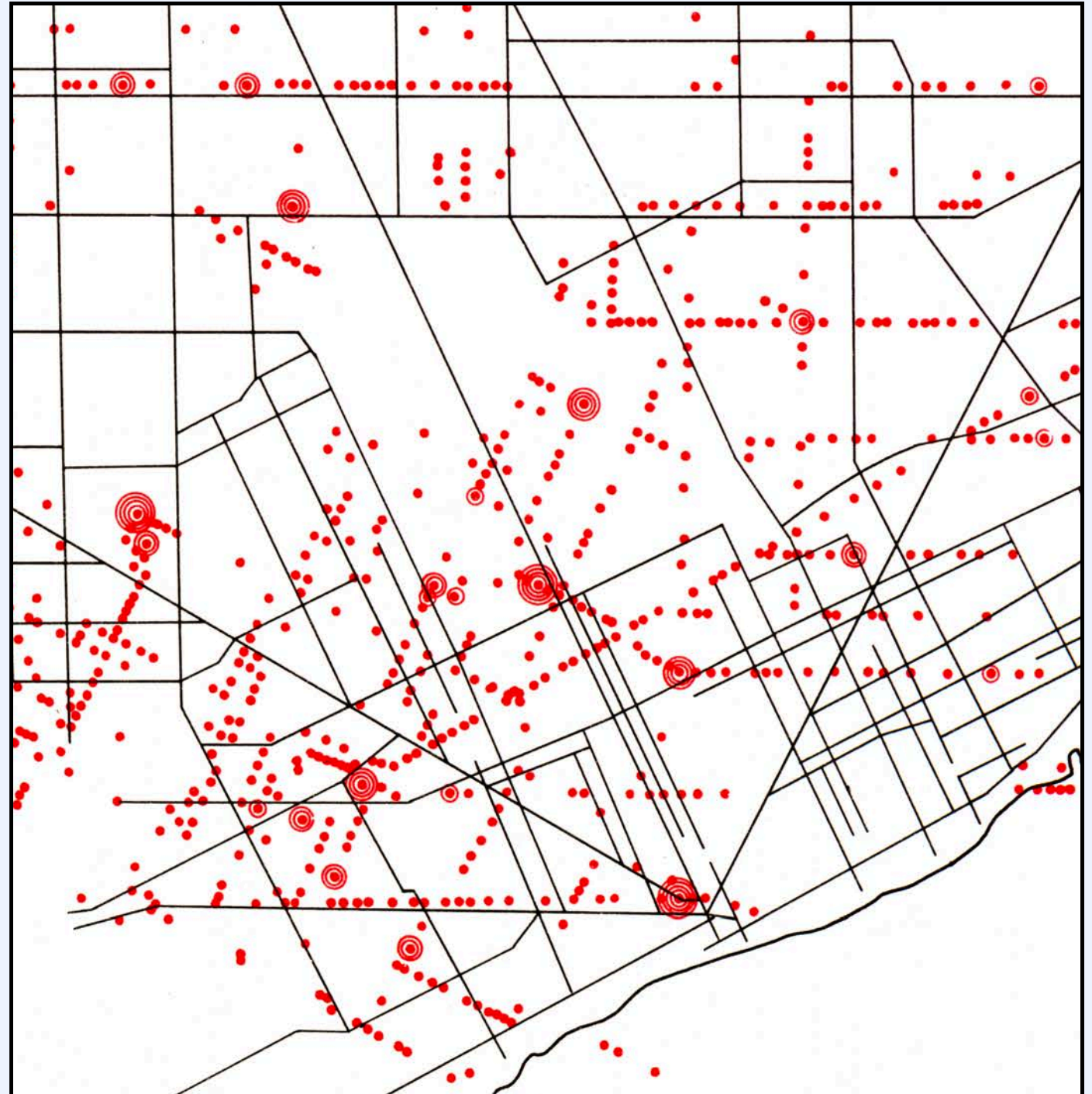
London
County
Council Bomb
Damage Maps
for the City,
Whitechapel,
Holborn and
Bloomsbury
(1945). Detail
from sheet 64
covering
Holborn;
Bloomsbury;
City of London
(West).



9. Children's automobile accidents in Detroit

William Bunge is a curious figure in post-World War II cartography. Labeled a "disciplinary bad boy" and a "radical geographer," he made significant contributions to the field of quantitative spatial analysis.

His map called "Children's Automobile 'Accidents'" appeared in Bunge's 1988 Nuclear War Atlas, but it is based on research that he undertook in the 1960s. The map suggests that the high rate of injury of inner-city Detroit school children by automobiles shouldn't be attributed to "accident."



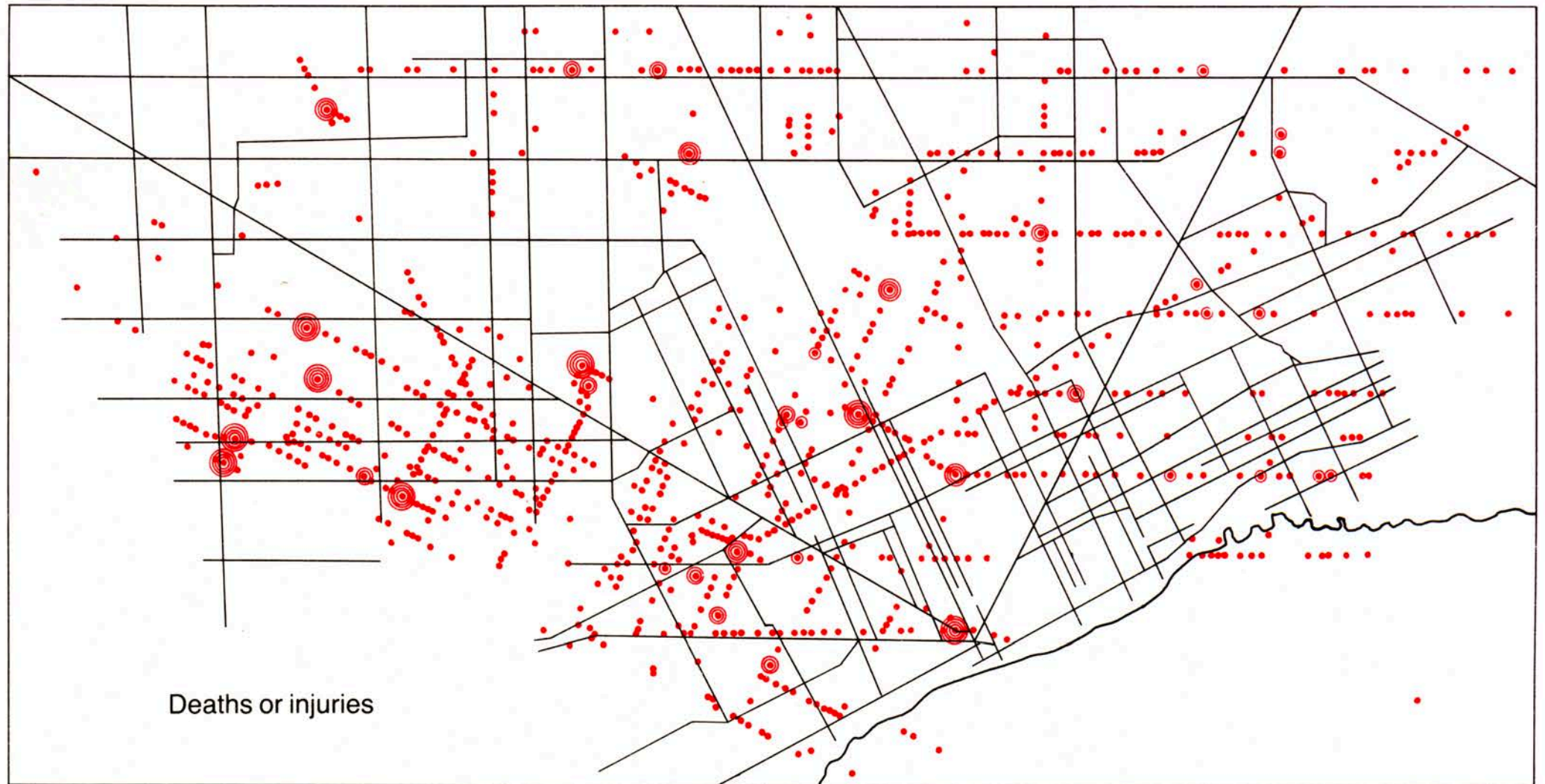
“

*In front of schools as many as five or six
"accidents" occur like clockwork each
year. If you can predict an event, why
call it an "accident"?*

William Bunge

The Nuclear War Atlas

Children's
Automobile
"Accidents" in
Detroit. Bunge,
William. 1988.
Nuclear War
Atlas

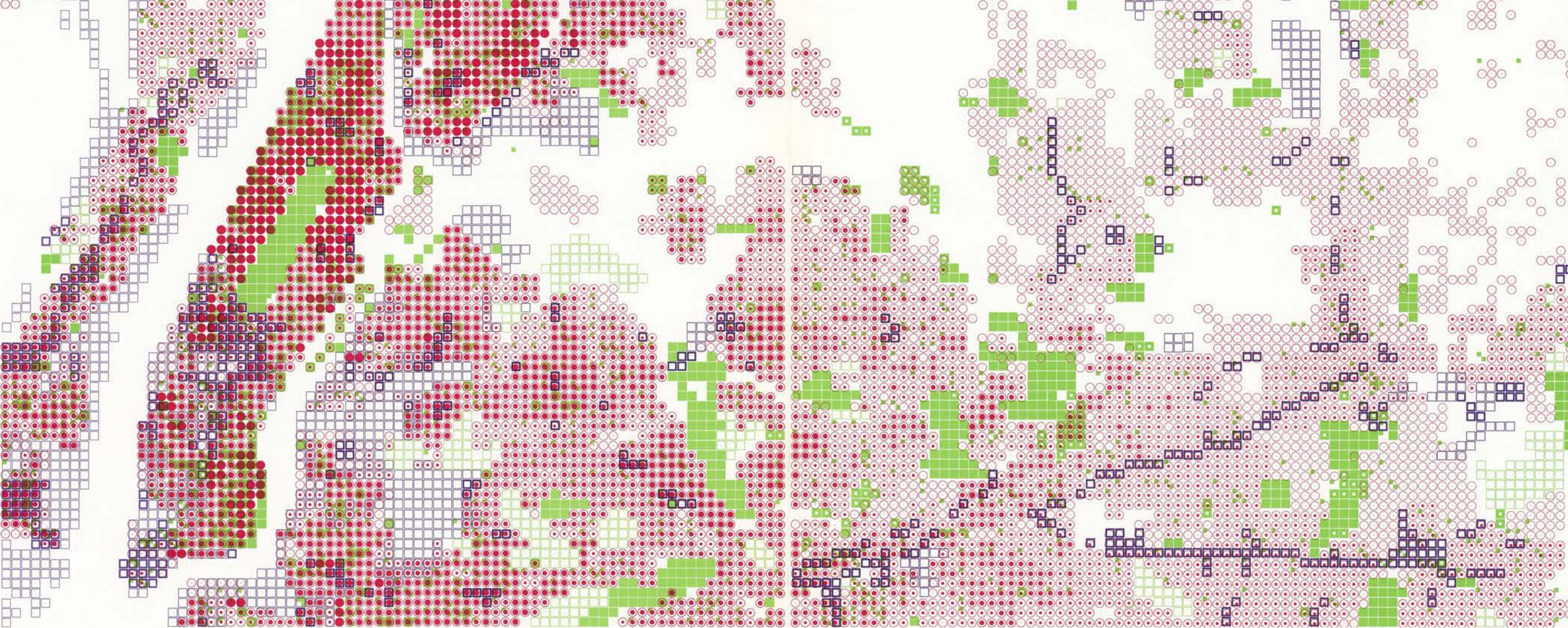


10. Urban Atlas: 20 American Cities

This iconic 1966 urban atlas by Richard Saul Wurman and Joseph R. Passonneau is the first comparative statistical analysis of 20 American cities. The goal of the atlas was to provide "visual systems of programming information for metropolitan-scale design."

The map scale of 1:48,000 is consistent across all locations and allows the reader to compare data on topics like population density, income intensity, and land use. The map on the right visualizes data on residential population density and land use for the city of Boston.





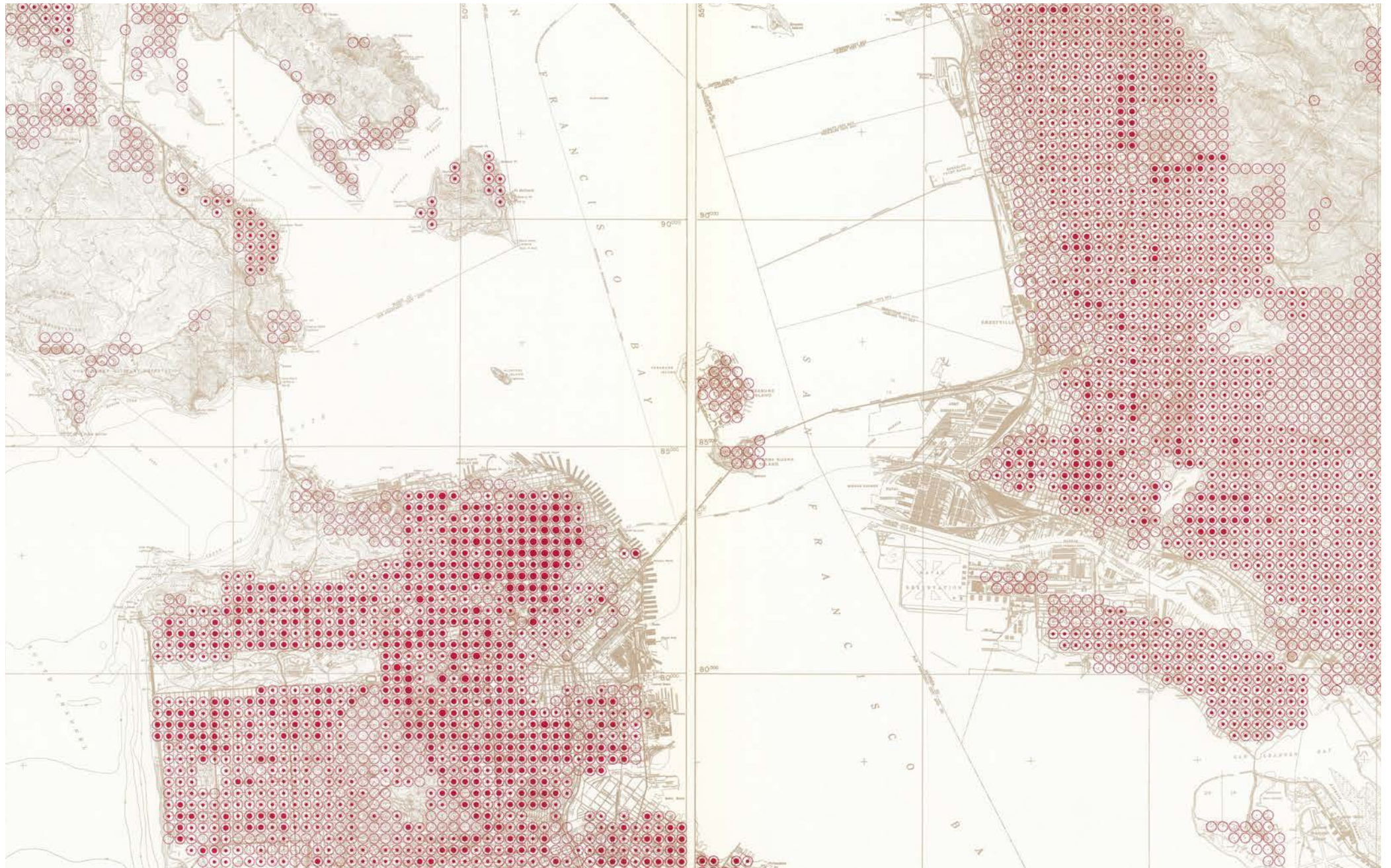
URBAN CARTOGRAPHY

Map of New York City
with two data
overlays - land use
and residential
population density.
Published in Urban
Atlas: 20 American
Cities (1966)

The authors of the atlas believed that planning professionals should have standards against which to measure the adequacy of their plans along with precise techniques for describing the urban environment and the forces that shape it.

In developing such a technique, they used a set of symbols - circles, dots, and squares - with different filling options on a uniform grid to provide comparative "data maps." The production process was partly manual and partly automated.

Map of
residential
population
density in San
Francisco.
Published in
Urban Atlas: 20
American Cities.



“

Comparable data mapped at the same scale for a number of cities are useful because unfamiliar situations are best described and understood by comparison with familiar situations.

Richard Saul Wurman and Joseph R. Passonneau

Urban Atlas: 20 American Cities

“Urban Atlas: 20 American Cities” is described as a pioneering work in the history of information graphics and provides some of the best examples for visually organizing urban data.

20 Maps Describing Residential Population Density. A small multiple diagram from Richard Saul Wurman and Joseph R. Passonneau's iconic urban atlas.

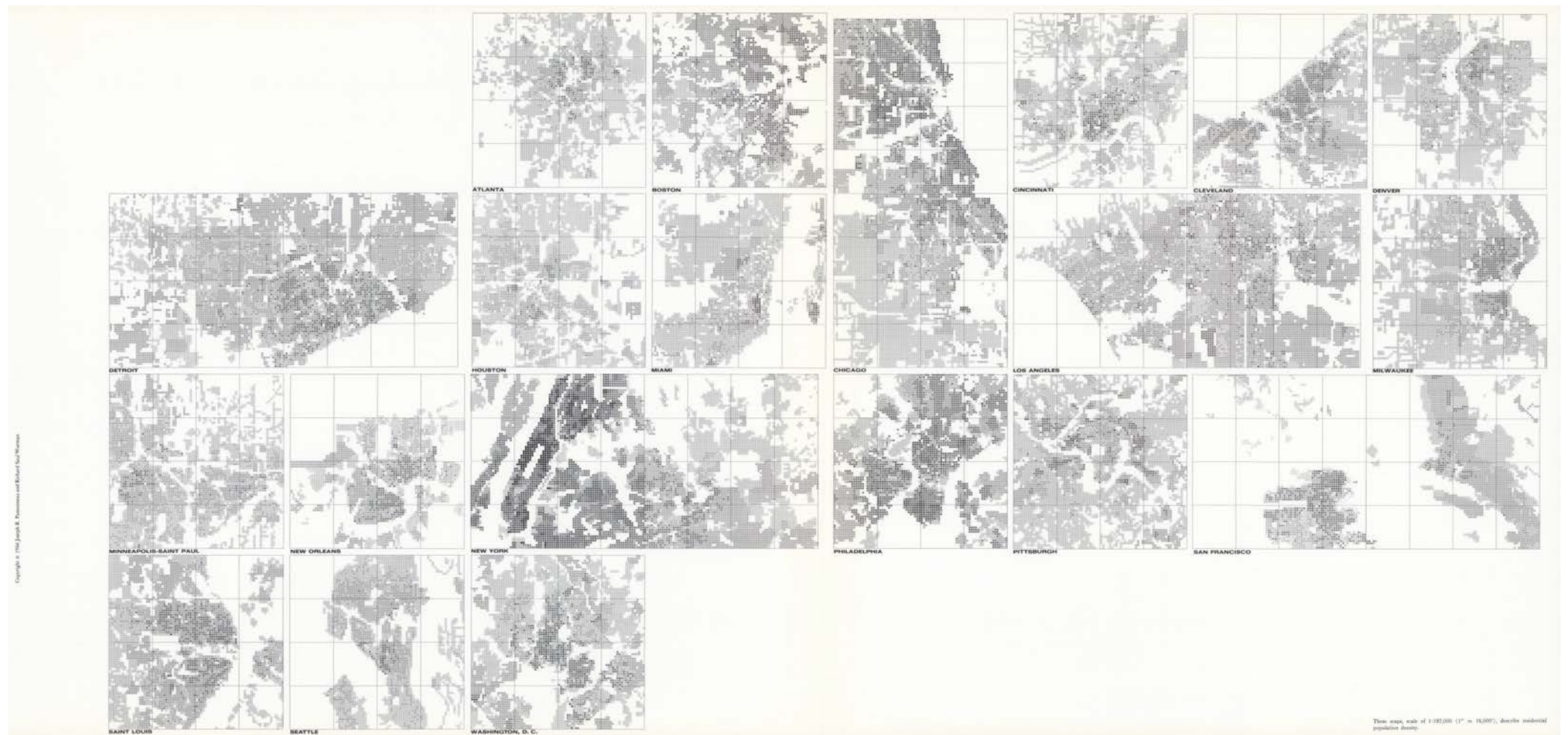


Image sources:

1. Nuova Topografia di Roma di Giovanni Battista Nolli (1748). Wikipedia
2. Original map by John Snow showing the clusters of cholera cases in the London epidemic of (1854). Wikipedia
3. Map Descriptive of London Poverty, 1898-9. LSE Library's Charles Booth archive.
4. Hull House Maps (1895). Cornell University – PJ Mode Collection of Persuasive Cartography.
5. The Philadelphia Negro; a social study by W. E. B. Du Bois (1868-1963). Internet Archive.
6. Image 286 of Sanborn Fire Insurance Map from New York, Bronx, Manhattan, New York. 1903 - 1919 Vol. 5, 1911. 130. Library of Congress Geography and Map Division Washington, D.C. 20540-4650 USA

Sanborn Fire Insurance Map from Mexico City, Federal District, Distrito Federal (1905). Library of Congress Geography and Map Division Washington, D.C. 20540-4650 USA
7. Chicago's Gangland by Frederic M. Thrasher (1927). Cornell University – PJ Mode Collection of Persuasive Cartography.
8. Layers of London is a map-based history website developed by the Institute of Historical Research. Bomb Damage Layer.
9. Children's Automobile "Accidents" in Detroit by William Bunge (1988). Cornell University – PJ Mode Collection of Persuasive Cartography.
10. Urban Atlas: 20 American Cities. A Communication Study Notating Select Urban Data at a Scale of 1:48,000. Authors: Richard Saul Wurman and Joseph R. Passonneau (1966). David Rumsey Historical Map Collection



MORPHOCODE

Exploring cities through data analysis and visualization

