Report of the Council of hygiene and public health of the Citizens' Association of New York upon the sanitary condition of the city / published, with an introductory statement, by order of the council of the Citizens'Association.

Contributors

Citizens' Association of New York. Council of Hygiene and Public Health.

Publication/Creation

New York : D. Appleton and Co., 1865.

Persistent URL

https://wellcomecollection.org/works/bcjp3ujy

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

WB 55
K3
THE ROYAL SOCIETY OF HEALTH LIBRARY

THE ROYAL SOCIETY
FOR THE PROMOTION
OF HEALTH

Founded 1876

LIBRARY REGULATIONS

(a) Books, periodicals and pamphlets may be borrowed by Fellows, Ordinary Members, Associates and Affiliates personally or by a messenger producing a written order. The person to whom such publications are delivered shall sign a receipt for them in a book provided for that purpose.

(b) Publications may be borrowed through the post, or by other means of carriage, upon a written order. The postage or carriage of publications returned to the Society shall be defrayed by the borrower.

(c) A borrower may not have more than three publications in his possession at one time.

(d) A borrower will be considered liable for the value of any publication lost or damaged while on loan to him, and, if it be a single volume or part of a set, for the value of the whole work thereby rendered imperfect. Marking or writing in the publications is not permitted, and borrowers are requested to call attention to damage of this character.

(e) Books and pamphlets may be retained for twenty-eight days. Periodicals may be retained for fourteen days. Applications for extension of the loan period must be made in writing before its expiry. No publication may be kept longer than three months.

(f) Books and pamphlets added to the library will not be lent until after the expiry of one month from the date received. The current number of a periodical may not be borrowed.

(g) Borrowers retaining publications longer than the time specified, and neglecting to return them when demanded, forfeit the right to borrow until they be returned, and for such further time as may be ordered by the Council.

Any borrower failing to comply with a request for the return of a publication shall be considered liable for the cost of replacing it, and the Council may, after giving due notice to him, order it to be replaced at his expense.

No publication may be reissued to the same borrower until at least seven days have elapsed after its return, neither may it be transferred by one borrower to another.

(h) Publications may not be taken or sent out of the United Kingdom.

(i) Publications returned through the post must be securely packed in a box or otherwise adequately protected.

(j) The Library may be used for reference by Fellows, Ordinary Members, Associates and Affiliates during the office hours of the Society.

(k) Parcels should be addressed:

THE ROYAL SOCIETY OF HEALTH
90 BUCKINGHAM PALACE ROAD, LONDON, S.W.1



22101880265

LIBRARY

Med
K23606

Formerly

THE ROYAL SOCIETY
FOR THE PROMOTION
OF HEALTH
90 Buckingham Palace Road, London, S.W.1
Class No. Z/38 Acc. No.
This book is returnable on or before the last date Marked below

HISTORICAL

For reference only

Presented to the Peabody Museum
by
Edwin Chadwick Esq.
Genl. Secy. Poor Law Comm.
London

From the
Council of Hygiene
C. Harris M.D.
Secretary.
New York May 8th 1865.

REPORT

OF THE

COUNCIL OF HYGIENE AND PUBLIC HEALTH

THE ROYAL SOCIETY
OF HEALTH
LIBRARY

OF THE

Citizens' Association of New York

UPON THE

SANITARY CONDITION OF THE CITY.

Formerly
THE ROYAL SANITARY INSTITUTE
LIBRARY

PUBLISHED, WITH AN INTRODUCTORY STATEMENT, BY ORDER OF THE COUNCIL OF THE CITIZENS' ASSOCIATION.

NEW YORK:
D. APPLETON AND COMPANY,
443 & 445 BROADWAY.
1865.

12770210

ENTERED, according to Act of Congress, in the year 1865, by
D. APPLETON AND COMPANY,
In the Clerk's Office of the District Court of the United States for the Southern District of New York.

WELLCOME INSTITUTE LIBRARY
Coll. wellMOmec
Call No. WA

CONTENTS.

PAGE

I. Introductory Statement by the Council of the Citizens' Association vii

FIRST PART.

II. Minute of Resolution by the Council of Hygiene, submitting the Report to the Citizens' Association xx

III. Copy of Resolution by the Citizens' Association, accepting the Report and ordering it to be published xx

IV. Special Report of the Executive Committee of the Council:—A Sketch of the Origin and Progress of the Sanitary Survey of the City xxi

1. Boundaries and Distribution of the Sanitary Inspection Districts xxii
2. Instructions to the Sanitary Inspectors xxiv
3. The System of Daily Records xxvi
4. Subjects of Inquiry xxvii
5. Reports on Pestilential Diseases xxviii
6. Progress of the Survey ..... xxx–xxxv

V. General Report of the Council:—

1. Preliminary Statement—Purposes of Sanitary Inquiry xxxvii
2. Sanitary Necessities of Great Cities xxxviii
3. The Aggregation of Population in Towns and Cities xxxviii
4. Avoidable and Preventable Causes of Disease and Death ... xxxix
5. Rates of Inevitable Sickness and Mortality xl
6. Standards of Health xli
7. The Study of Sickness-rates xlii
8. Rates of Constant Sickness in the City of New York xliii
9. The Death-rate in New York xliv
10. Preventable Causes of Disease xlvii
11. The Association of the External and the Personal Causes of Disease illustrated xlix
12. Examples of Preventable Diseases and their Causes l
13. Specific Causes of Preventable Diseases illustrated by the History of Typhus-fever in the City, and by the spread of Small-pox from the City to the Country lvi
14. Recommendations concerning the Control of Contagions and Infections lxi

PAGE

15. The Localizing Causes of Prevailing Diseases..... lxii
16. Recommendations by the Council for maintaining a System of Sanitary Inspection and Inquiry..... lxvii
17. The Tenant-Houses of New York..... lxviii
18. Tenant-Houses and their Inhabitants..... lxix
19. Statistics of Aggregation in New York compared with those of other great Cities..... lxxi
20. Observations upon the Sickness and Mortality in Tenant-Houses..... lxxiv
21. Dwelling Improvements—Examples and Recommendations.. lxxxvi
22. Sanitary Wants of Private Dwellings, Hotels, and Public Conveyances..... lxxxix
23. Neglected Privies and Dark Places..... xci
24. Special Nuisances..... xcii
25. Drainage and Sewerage of the City..... xcvi
26. Special Application of Chemistry and other Sciences to Sanitary Works..... xcviii
27. Special Report by Professors John W. Draper and R. O. Doremus upon the Hygienic Applications of Chemistry... xcix
28. The Practical Character of Sanitary Works..... civ
29. Prevalent Diseases which illustrate the Necessity of Sanitary Works..... cv
30. Fevers..... cv
31. Diarrhœal Maladies..... cviii
32. Small-pox—Vaccination..... cx
33. Examples of Sanitary Works and Results..... cxiii
34. Prospective View of the Sanitary Necessities of New York.. cxix
35. Practical Uses of Vital Statistics..... cxxi
36. Remedial Measures..... cxxv
37. Cleanliness and the Removal of Nuisances..... cxxviii
38. Ventilation and the Prevention of Overcrowding..... cxxix
39. Sanitary Care of Contagious and Pestilential Diseases..... cxxxv
40. Conclusions..... cxlii

SECOND PART.

VI. Reports of the Sanitary Inspectors:—

1. Catalogue of Inspectors and their Inspection Districts.....
2. First Sanitary Inspection District; Dr. Joseph A. Monell's Report 3
3. Second Sanitary Inspection District; Dr. Isaac L. Millspaugh's Report..... 14
4. Third Sanitary Inspection District [Section A]; Dr. Hampton Harriot's Report..... 19
5. Third Sanitary Inspection District [Section B]; Dr. B. M. Keeney's Report..... 33
6. Fourth Sanitary Inspection District; Dr. E. R. Pulling's Report... 43

PAGE

7. Fifth Sanitary Inspection District [Section A]; Dr. E. B. Warner's Report 66
8. Fifth Sanitary Inspection District [Section B]; Dr. J. W. Purdy's Report..... 70
9. Sixth Sanitary Inspection District; Dr. Wm. F. Thoms' Report.. 73
10. Seventh Sanitary Inspection District; Dr. P. Nolan's Report.... 85
11. Eighth Sanitary Inspection District; Dr. J. T. Kennedy's Report 91
12. Ninth Sanitary Inspection District; Dr. Oscar G. Smith's Report 97
13. Tenth Sanitary Inspection District; Dr. John C. Acheson's Report 110
14. Eleventh Sanitary Inspection District; Dr. James L. Brown's Report..... 116
15. Twelfth Sanitary Inspection District; Dr. F. A. Burrall's Report. 126
16. Thirteenth Sanitary Inspection District; Dr. Robert Newman's Report..... 142
17. Fourteenth Sanitary Inspection District; Dr. E. W. Derby's Report..... 165
18. Fifteenth Sanitary Inspection District; Dr. James Ross's Report. 171
19. Sixteenth Sanitary Inspection District; Dr. Wm. C. Hunter's Report..... 182
20. Seventeenth Sanitary Inspection District; Dr. Guido Furman's Report..... 195
21. Eighteenth Sanitary Inspection District; Dr. H. M. Field's Report..... 206
22. Nineteenth Sanitary Inspection District; Dr. J. R. Mansfield's Report..... 221
23. Twentieth Sanitary Inspection District; Dr. E. H. Janes's Report 226
24. Twenty-first Sanitary Inspection District; Dr. James L. Little's Report..... 253
25. Twenty-second Sanitary Inspection District; Dr. R. L. Parsons's Report..... 268
26. Twenty-third Sanitary Inspection District; Dr. Ellsworth Eliot's Report..... 282
27. Twenty-fourth Sanitary Inspection District; Dr. Robert Stewart's Report..... 291
28. Twenty-fifth Sanitary Inspection District; Dr. J. Lewis Smith's Report..... 298
29. Twenty-sixth and Twenth-seventh Sanitary Inspection Districts; Drs. Hadden and Brush's Report..... 323
30. Twenty-eighth Sanitary Inspection District; Dr. L. A. Rodenstein's Report..... 335
31. Twenty-ninth Sanitary Inspection District; Dr. Joseph O. Farrington's Report..... 345

VII. Synopsis of Tenant-House Statistics..... 349

VIII. Index..... 351

LIST OF ILLUSTRATIONS.

1. Sanitary and Topographical Map of the City and Island of New York. *Lithograph, colored.*
2. Engraving from a Photographic View of a Newly-Constructed Fever-Nest in the Sixth District..... facing p. lxxvi
3. Engraving from a Photographic View of "Gotham Court" (illustrating Chapter on Tenant-Houses)..... lxxx
4. Floor-Plan of a Fever-Nest near the Central Park..... lxxxi
5. Mr. Waterlow's Plan of Healthy Tenant-Dwellings.....facing p. lxxxvi
6. A Chart illustrating the Encroachment of Nuisances upon Populous Up-Town Districts..... facing p. xciv
7. Engraving from a Photographic View of a Fever-Nest in the First Ward.. facing p. 8
8. Map illustrating the Hydrography, Drainage and Sewerage, and the Medical Topography of the Third District.....facing p. 21
9. Chart of a Region of Typhus and Small-pox in the Fifth Ward..... 31
10. Sanitary and Social Chart of the Fourth District. *Lithograph, colored*.... 43
11. Ground-Plan of "Gotham Court"—its Drainage and Crowding..... 50
12. Sectional Elevation of the main building in Do..... 50
13. Floor-Plan of the domiciles in Do..... 51
14. Transverse Sectional Views of Do..... 53
15. Chart of a Crowded Mass of Tenant-Houses on Vandewater Street..... 57
16. A Sectional View of a Fever-Nest on Pearl Street..... 78
17. Ground-Plan of Do..... 79
18. An Upper Floor-Plan of Do..... 79
19. View of a Public School and an adjacent Slaughter-Pen.....facing p. 87
20. Chart of a Region of Fat-melting, Hide-curing, and Slaughter Nuisances in the shopping neighborhood of the 7th District..... 88
21. Plan and Sectional View of a Fever-nest in the 9th District..... 103
22. Floor-Plan of an Improved Tenant-House in the 11th District..... 122
23. Map Illustrating the Medical Topography and Drainage of the 15th Ward. 126
24. Plan and Sectional Views of an Overcrowded Tenant-House in the 12th District..... 136
25. Diagram of an Insalubrious Quarter in the 13th District..... 152
26. An Inside View of a Cattle and Sheep Market in Sixth Street..... 157
27. Chart of an Insalubrious Court and a Crowded Square in the 17th Ward.. 160
28. Market and Slaughter-Pens in the 11th Ward..... 176
29. Scene in Rivington Place..... 178
30. Tenant-House Cellar Nuisances in the 16th Ward..... 198
31. Plan of a Cellar Tenement in the 16th Ward..... 200
32. Floor Plan and a Sectional View of a Ventilated Tenant-House..... 204
33. Map illustrating the Medical Topography of the 18th District..... 207
34. Floor-Plan of a Fever-Nest in Do..... 217
35. Plans of Dirt-Catchers and Cleaning Chambers for Sewers..... 234, 235
36. Another Plan of Do., and of a Culvert..... 436
37. An Isometrical View of a new Fever-Nest in a Crowded Square..... 239
38. The Ground-Plan and Chart of Do..... 239
39. Four Figures illustrating Cubical Air-Spaces and Ventilation..... 258
40. Floor-Plan of an ordinary and unhealthy Tenant-House in the 20th Ward. 259
41. Floor-Plan of Tenant-House with Through-and-Through Ventilation..... 261
42. Floor-Plan of a Tenant-House with Ventilating Shaft..... 261
43. Chart of a Region of Nuisances in the 20th Ward..... 266
44. Ground-Plan of a Fever-Nest in East 28th Street..... 275
45. Diagram of a Perpetual Fever-Nest in the 21st Ward..... 280
46. Plot of an Insalubrious District in the 21st Ward..... 287
47. A Bird's-eye View of a Rookery at the foot of Murray Hill..... 289
48. The Ground-Plan of Do..... 289
49. Map of the Sanitary Topography of the 25th District..... 299
50. Map of a Pestilential Spot on the margin of the Central Park..... 316
51. Descriptive Chart of an Unhealthy Neighborhood near the Central Park... 318
52. Improved Garbage Receptacles, etc., for Tenant-Houses..... 332

INTRODUCTORY STATEMENT

BY THE

COUNCIL OF THE CITIZENS' ASSOCIATION.

The Citizens' Association of New York was organized for purposes of public usefulness. The deep convictions of duty and necessity that led to the preparation of the plans upon which this Association has commenced its efforts, have met with hearty responses from all classes of philanthropic and learned men whose counsel and aid have been invoked in our voluntary work of municipal reform and public improvement. To its Council of Hygiene and Public Health, and to its Board of Legal Advisers, the Citizens' Association, and the City of New York, have been placed under lasting obligations, for labors in which the greatest professional learning and skill, combined with noble and philanthropic purposes, and individual sacrifices of time and personal efforts, have been voluntarily contributed for the single object of promoting the welfare of the community, and benefiting all classes in the city.

The Council of Hygiene and Public Health now presents to this Association its first *General Report upon the Sanitary Condition and Hygienic Wants of New York;* and the Central Council of the Association has ordered it published and widely circulated, in order that the public may immediately have access to this valuable source of information and practical suggestion.

The organization and efforts of the Council of Hygiene were begun very soon after the general plan of the Citizens' Association was announced. The advice and knowledge of leading hygienists and medical gentlemen of great familiarity with the social and sanitary necessities of the people of this City were sought, and, at the request of the Council of this Association, an effective organization for Sanitary Inquiry and Advice was instituted. The necessity that exists for the commencement of such voluntary labors has long been conceded by the managers of benevolent institutions in the city, and, from this and other circumstances, the members of this body were fully prepared to appreciate the practical value and bearings of such work. They have unhesitatingly acted upon the information and suggestions which their Council of Hygiene has rendered; and they desire to state that in all its labors, suggestions, and advice, that Council has manifestly been actuated by an earnest and fearless purpose to benefit mankind, and to contribute most directly to the physical and moral welfare of their fellow-citizens. Thus its plans have entirely harmonized with the great objects of the Citizens' Association, and at the same time has furnished

a perfect example of both the utility and the necessity of such *voluntary effort.*

The WORKS of the COUNCIL OF HYGIENE will best perpetuate the history of its organization; therefore we will simply put on record here the preliminary correspondence, in which, without any purpose of organized effort and co-operation, a large number of physicians, who are distinguished for learning and experience in hygiene, gave expression to the leading facts upon which the argument for Sanitary Reform is based by this ASSOCIATION.

The Citizens' Association of New York,

Office, 813 *Broadway.*

NEW YORK, *March 2d*, 1864.

To

VALENTINE MOTT, M. D.,
WILLARD PARKER, M. D.,
JAMES R. WOOD, M. D.,
STEPHEN SMITH, M. D.,
JOHN H. GRISCOM, M. D.,
ISAAC E. TAYLOR, M. D.,
ELISHA HARRIS, M. D.,
WM. C. ANDERSON, M. D.,
EDWARD DELAFIELD, M. D.,
JOSEPH M. SMITH, M. D.,
JOHN O. STONE, M. D.,
CHAS. HENSCHEL, M. D.,
ISAAC WOOD, M. D.,
CHARLES D. SMITH, M. D.,
E. R. PEASLEE, M. D.,
AUSTIN FLINT, M. D.,
FRANK H. HAMILTON, M. D.,
B. FORDYCE BARKER, M. D.,
THADDEUS HALSTED, M. D.,
JARED LINSLEY, M. D.,
J. T. METCALFE, M. D.,
GURDON BUCK, M. D.,
WM. N. BLAKEMAN, M. D.,
JAMES ANDERSON, M. D.

DEAR SIRS:

Our Association is deeply impressed with the importance of taking active steps in relation to the Sanitary Condition of our City.

At a meeting of the CITIZENS' ASSOCIATION of New York, held on the 29th February, ult., the undersigned were appointed a Committee to address a Letter to Physicians, for the purpose of obtaining from the Medical Profession the fullest and most reliable information relative to the public health. Will you, at your earliest convenience, favor us with the desired information?

The importance of this subject to all classes can scarcely be over-estimated,

as from the evidence already before this Association it appears that the excess of mortality is needless and alarming.

Very respectfully, yours,

HAMILTON FISH,
JOHN DAVID WOLFE,
EDWARD S. JAFFRAY,
JOHN JACOB ASTOR, JR.,
JAMES M. BROWN,
JONATHAN STURGES,
ROBERT B. ROOSEVELT,
AUGUST BELMONT,
CHARLES O'CONOR,
NATHANIEL SANDS,
CHARLES A. SECOR,
MORRIS KETCHUM,

Committee appointed at a Meeting of the Citizens' Association of New York, held February 29, 1864.

NEW YORK, *March 9th*, 1864.

TO THE COMMITTEE ON SANITARY INQUIRY, &C., OF THE CITIZENS' ASSOCIATION OF NEW YORK.

GENTLEMEN:

In replying to your letter of inquiry requesting information concerning the public health of this city, we would briefly state a few leading facts relating to the rate of mortality in this community, and also refer to some of the conditions of insalubrity among us.

The city of New York ought to be one of the most healthy cities in the world, for no other large city is favored with greater natural advantages of locality and climate, and probably no city has a greater influx of a vigorous and healthy population, from the rural districts and from foreign countries.

But a fearfully HIGH DEATH-RATE prevails in this city. This is the sure criterion of the public health, and it is the most reliable test of the sanitary condition of any populous community. Extensive observation proves that it is not difficult to state about what proportion of deaths in great cities may properly be attributed to PREVENTABLE DISEASES, and consequently what may be properly regarded as a necessary and inevitable rate of mortality in such a population.

The highest medical and statistical authorities of Europe have shown the propriety and importance of such estimations in vital statistics.

The total number of deaths in the city of New York, during the year 1863, according to the City Inspector's returns, was 25,196! This is equal to *one death* in *every thirty-five* of the inhabitants, estimating the population of the city last year at 900,000.

According to Dr. E. M. Snow, the distinguished Health Officer of Provi-

dence, Rhode Island, the mortality in the following six neighboring cities, during the year 1863, may be stated as follows:

	Estimated Population.	Deaths 1863.	Of Population, one in
New York	900,000	25,196	35.7
Philadelphia	620,000	14,220	43.6
Boston	194,000	4,698	41.2
Newark, N. J.	85,000	1,952	43.5
Providence	55,000	1,214	45.3
Hartford	32,000	583	54.8

It is not for us to state what the rate of mortality in New York should have been, under proper sanitary regulations, the past year, but we would present a few facts to show the results of improvements in sanitary government of great cities, which, with natural advantages of salubrity far inferior to those of New York, have been rescued from a condition of fearful insalubrity, and rendered far more healthful than our city now is.

Previous to establishing a good Sanitary Government, the annual rate of Mortality was—		The rate of Mortality in the same Cities, with the present system of Sanitary Government, has been—	
In London	1 in 20	In London	1 in 45
In Liverpool	1 in 28	In Liverpool	1 in 44
In Philadelphia	1 in 39	In Philadelphia	1 in 44 to 1 in 57
In New York,			
At present	1 in 35+		
Do., average of last ten years	1 in 32½		

While in the City of New York the death-rate has increased from 1 in 46½, [in the year 1810,] to 1 in 35, at the present time.

Facts like these should arouse the attention of all persons who feel an interest in human welfare, or in the prosperity of our city. Yet we would point to the high death-rate that prevails in the city simply as a reliable index to the physical sufferings, the want, the neglect, the sickness, the orphanage and pauperism, with which such excessive mortality is always associated.

The fact that any considerable excess of mortality above a proper and inevitable death-rate, arises from causes that may and should be prevented by sanitary regulations, is now admitted by all intelligent physicians and social economists.

By means of suitable sanitary regulations, and a faithful and competent administration of such laws, the rate of mortality in this city ought to be very greatly reduced. The experience of other great cities, and the teachings of sanitary science, warrant the opinion that the present rate of mortality may be reduced fully THIRTY PER CENT. Such a reduction would save from 7,000 to 10,000 lives in this city during the present year. But the saving of this vast number of precious lives is not the only, nor is it the greatest, benefit that

would result to the health and welfare of the city by means o suitable sanitary government.

It is a medical and statistical fact that for every death in a large community there are at least *twenty-eight* cases of sickness. This would give, in the population of our city, *upwards of two hundred thousand cases of preventable and needless sickness every year!* This conclusion is fully warranted by the statistics of our public charities, and by medical observation, and it is based upon broad inquiries and generalization respecting sickness and mortality in Great Britain, as stated by Dr. Lyon Playfair, a distinguished authority in Hygiene.

It is a maxim in the medical profession that it is far easier to *prevent* disease than to *cure* it, and it certainly is far more economical to do so. And when we remember that the great excess of mortality and of sickness in our city occurs among the *poorer classes* of the population, and that such excessive unhealthiness and mortality is a most prolific source of physical and social want, demoralization and pauperism, the subject of needed sanitary reforms, in this crowded metropolis, assumes such important bearings and such a vast magnitude as to demand the most serious consideration of all persons who regard the welfare of their fellow-beings, or the best interests of the community.

We need not represent to you the great interest which every other city and town in our country has in the question of health and disease in this great emporium of commerce; nor need we, as physicians, speak of the official abuses that prevent sanitary improvement and good government. When pestilential diseases visit this city, the impotence of the existing sanitary system is confessed, and the people are panic-stricken, while the interests of commerce suffer by the insensible and certain *loss of millions.*

In the final report of the Aldermanic Committee on Public Health, of which Ex-Gov. E. D. Morgan was the Chairman, in the cholera season of 1849, the fact is stated that "New York is destitute of a Sanitary Police worthy the name." Again, the chief officer of the so-called Sanitary Bureau of the City Government, in his annual report in the year 1861, asks: "How is this state of things, which marks with shame the great City of New York, to be remedied?" And he answers: "The power of remedy does not rest in me, nor in the departments over which I have the honor to preside."

Small-pox, and other infectious and loathsome diseases, are allowed to prevail and be diffused continually in all parts of the city; the worst causes of fevers and other fatal maladies are being continually generated in the crowded habitations of the poor; while from this, as a radiating centre of disease, the poisons of death that are so abundant here, are diffused widely throughout the entire country.

We will not extend this statement, but would conclude by saying that the sacredness of human life and the inestimable value of health are incentives that can be relied upon to secure the coöperation of all true physicians in your efforts to promote sanitary reforms.

Respectfully, yours,

VALENTINE MOTT, M. D., 1 Gramercy Park.
WILLARD PARKER, M. D., 37 East 12th Street.
ISAAC WOOD, M. D., 68 East 17th Street.
JAMES R. WOOD, M. D., 2 Irving Place.
JAMES ANDERSON, M. D., 30 University Place.
JOHN H. GRISCOM, M. D., 42 East 29th Street.
WM. C. ANDERSON, M. D., 3 Union Square.
ISAAC E. TAYLOR, M. D., 13 West 20th Street.
STEPHEN SMITH, M. D., 55 West 34th Street.
EDWARD DELAFIELD, M. D., 2 East 17th Street.
ELISHA HARRIS, M. D., 55 West 34th Street.
JOSEPH M. SMITH, M. D., 11 East 17th Street.
JOHN O. STONE, M. D., 27 East 23d Street.
CHAS. HENSCHEL, M. D., 20 East 14th Street.
E. R. PEASLEE, M. D., Fifth Avenue Hotel.
AUSTIN FLINT, M. D., 259 Fourth Avenue.
FRANK H. HAMILTON, M. D., Bellevue Hosp. Coll.
CHAS. D. SMITH, M. D., 20 West 19th Street.
B. FORDYCE BARKER, M. D., 75 Madison Ave.
THADDEUS M. HALSTED, M. D., 42 West 23d Street.
JARED LINSLY, M. D., 22 Lafayette Place.
J. T. METCALFE, M. D., 34 East 14th Street.
GURDON BUCK, M. D., 121 Tenth Street.
WM. N. BLAKEMAN, M. D., 113 Tenth Street.

To Hamilton Fish, Esq.,
John David Wolfe, Esq.,
Edward S. Jaffray, Esq.,
John Jacob Astor, Jr., Esq.,
August Belmont, Esq.,
Charles O'Conor, Esq.,
Robert B. Roosevelt, Esq.,
Charles A. Secor, Esq.,
Jonathan Sturges, Esq.,
Morris Ketchum, Esq.,
James M. Brown, Esq.,
Nathaniel Sands, Esq.
} *Committee for Sanitary Inquiry, &c.*

Franklin's aphorism that *Public Health is Public Wealth*, finds ample confirmation in the experience of all populous communities; and when our best medical men assure us that a vast proportion of the sickness in our city

is produced by causes that are positively *preventable*, or that may be removed; and when they state the fact that the preventable waste of life and health, in the City of New York, may safely be estimated at *seven thousand lives*, and *more than two hundred thousand cases of sickness* every year—shall not every citizen bestir himself to terminate such a waste of the richest physical blessings which the Creator has bestowed upon mankind? "All that a man hath will he give for his life;" and yet, to society at large, the care and protection of life and health is a cumulative good, which confers benefits that multiply and extend like the good deeds of well-spent days. Sanitary improvements directly promote the material advancement of a people, while they bring into operation the most reliable and effectual agencies for social and moral elevation.

Their ultimate and highest results reach far beyond pecuniary advantage; they take deep hold upon the noblest sympathies and sentiments of all classes of society; they confer benefits upon all alike.

The relation of the health and vigorous life of a people to the State, or to commercial prosperity, requires no discussion in this statement. From Plato to the greatest of modern statesmen and economists, the sanitary welfare of a people has justly been deemed an essential element of social and commercial advancement; and so intimately related do we find the sanitary and the social wants of the population in the City of New York, that, from the outset of reformatory efforts, whether social and political or exclusively moral and religious, sanitary improvement is a work of paramount necessity. "There is," says the Edinburgh

Review (vol. xci., 1850), "a most fatal connection between physical uncleanness and moral pollution. The condition of a population becomes invariably assimilated to that of their habitations. The indirect effects of sickness are far more hurtful, though less observable, than the direct effects of mortal disease; it lowers the tone, unstrings the nerves, and brings on physical languor and mental apathy." But beyond the physical, the mental, and the economical losses resulting from prevailing ill-health, there are certain political and social aspects of the same agencies that ought to be studied by every intelligent citizen. The mobs that held fearful sway in our city during the memorable outbreak of violence in the month of July, 1863, were gathered in the overcrowded and neglected quarters of the city. As was stated by a leading journalist at that time: "The high brick blocks and closely-packed houses where the mobs originated seemed to be literally *hives of sickness and vice.* It was wonderful to see, and difficult to believe, that so much misery, disease, and wretchedness can be huddled together and hidden by high walls, unvisited and unthought of, so near our own abodes. Lewd but pale and sickly young women, scarcely decent in their ragged attire, were impudent and scattered everywhere in the crowd. But what numbers of these poorer classes are deformed! what numbers are made hideous by self-neglect and infirmity! Alas! human faces look so hideous with hope and self-respect all gone! And female forms and features are made so frightful by sin, squalor, and debasement! To walk the streets as we walked them, in those hours of conflagration and riot, was like witnessing the

day of judgment, with every wicked thing revealed, every sin and sorrow blazingly glared upon, every hidden abomination laid before hell's expectant fire.

* * * * * *

"The elements of popular discord are gathered in those wretchedly-constructed tenant-houses, where poverty, disease, and crime find an abode. Here disease in its most loathsome forms propagates itself. Unholy passions rule in the domestic circle. Every thing, within and without, tends to physical and moral degradation."

In the Report of the Council of Hygiene will be found a body of evidence bearing upon the subject of Sanitary neglect as producing social degradation, which to readers and to legislators can scarcely be of less interest than the definite records and well-sustained conclusions therein contained respecting the existing sanitary condition and wants of the city, the preventable causes of disease, and the physical agencies and works required for the needed hygienic improvements.

It should be borne in mind that this preliminary labor of the Council of Hygiene and its corps of skilled and indefatigable Sanitary Inspectors, has been planned and performed voluntarily, and by gentlemen whose time and thoughts are burdened by their ordinary professional and official duties; and that none of the means or powers of the municipal government could be used in prosecuting the great work of inquiry and recording, which has, under peculiar disadvantages, but with marked success, been prosecuted by them.

The Citizens' Association asks the attention of the

people of the City and the State of New York to the facts set forth in this Sanitary Report, and it also asks that the needed works of SANITARY IMPROVEMENT be immediately begun by competent minds and competent hands. The skilled labors and trustworthy advice of a Voluntary Council of Hygiene, have definitely determined when and how such works of improvement should be commenced. They have shown what is the nature, and what must be the preventive or cure of existing causes of needless sickness, mortality, and public peril from removable evils.

To the physicians who have thus contributed lasting benefits to the public welfare, their own fellow-citizens and society at large are placed under renewed obligations. And in thus requesting and obtaining from the Profession that is ever in the front ranks of all great enterprises for human improvement such labors and such practical results, the Association has simply done what the people in their legislative capacity are in duty bound to do. A popular writer has stated that "The State which founds its legislation on a knowledge of realities, which expects from the physical sciences information respecting human life collectively, considered *in all its relations*, has a right to demand from its physicians a general insight into the nature and causes of popular diseases." *

The Association cannot close this Introduction without expressing its grateful estimate of the arduous and self-denying labors of the medical gentlemen, the fruit of whose researches is embodied in the Report. An investigation

* HECKER'S *Epidemics of the Middle Ages;* BABBINGTON'S EDITION.

so thorough, searching, and extensive, and directed by such genius and energy, has never before been attempted in our city or in this country. In pursuing their investigations they have not hesitated to sacrifice personal ease and comfort, and deny themselves many social enjoyments; they have exposed themselves to repulsive and nauseous scenes in the abodes of misery and want, and to the infectious localities and homes of disease and death, in order to be able to give an exact and complete survey of the sufferings, perils, and sanitary wants of the inhabitants of the crowded and insalubrious districts, and to secure the application of effective guarantees against future misery and death.

The Citizens' Association having determined to initiate reformatory movements that shall produce permanently beneficial results, and having taken counsel with able advisers, presents to the public this Report of its Council of Hygiene and Public Health, believing that the various questions which are therein examined and elucidated are of vital importance to the sanitary, commercial, and social welfare of New York.

The Council of the Citizens' Association.

JAMES BROWN,
ALEX. T. STEWART,
JOHN JACOB ASTOR, JR.,
EDWARD S. JAFFRAY,
PETER COOPER,
WASHINGTON R. VERMILYE,
NATHANIEL SANDS,
J. F. D. LANIER,
CHAS. A. SECOR,
WM. M. VERMILYE,
JOHN DAVID WOLF,
WM. E. DODGE,
ROBERT B. ROOSEVELT,
JONATHAN STURGES,
JAMES M. BROWN,
EDWIN HOYT,
HAMILTON FISH,
JOHN C. GREEN,
JAS. BOORMAN JOHNSTON,
MORRIS KETCHUM.

NEW YORK, January, 1865.

REPORT

OF THE

COUNCIL OF HYGIENE AND PUBLIC HEALTH

OF THE

CITIZENS' ASSOCIATION OF NEW YORK.

First Part:

INCLUDING THE REPORT FROM THE EXECUTIVE COMMITTEE AND THE GENERAL REPORT OF THE COUNCIL.

COUNCIL OF HYGIENE AND PUBLIC HEALTH;
CITIZENS' ASSOCIATION OF NEW YORK:

"*Resolved*, That the General Report of the Council, as presented by the Secretary, together with the accompanying Reports of the Sanitary Inspectors, is hereby approved, and that the same be submitted to the Citizens' Association.

"*Resolved*, That the Report of the Executive Committee be accepted by the Council, and that it shall constitute a preliminary section of the General Report.

"Adopted by the Council, January 9, 1865.

"JOSEPH M. SMITH, M. D., *President.*
"WILLARD PARKER, M. D., *Vice-President.*
"ELISHA HARRIS, *Secretary.*"

"CITIZENS' ASSOCIATION OF NEW YORK, 813 BROADWAY:

"*Resolved*, That the Report of the Council of Hygiene and Public Health is hereby accepted, and ordered to be published under the direction of that Council.

"Adopted by the Association, January 16, 1865.

"JAMES M. BROWN, *Chairman.*
"ROBERT B. ROOSEVELT, *Secretary.*"


NORTH
CENTRAL
PARK
MANHATTAN
SQUARE
HAMILTON SQUARE
BLACKWELLS
ISLAND
QUEENS
COUNTY
Long Island
BROOKLYN

Sanitary & Topographical Map

of the City and Island of New York

Scale 1000 Feet to 1 Inch.

Prepared for the Council of Hygiene and Public Health

of the CITIZENS ASSOCIATION.

under the direction of Topographical Engineer

EGBERT L. VIELE,

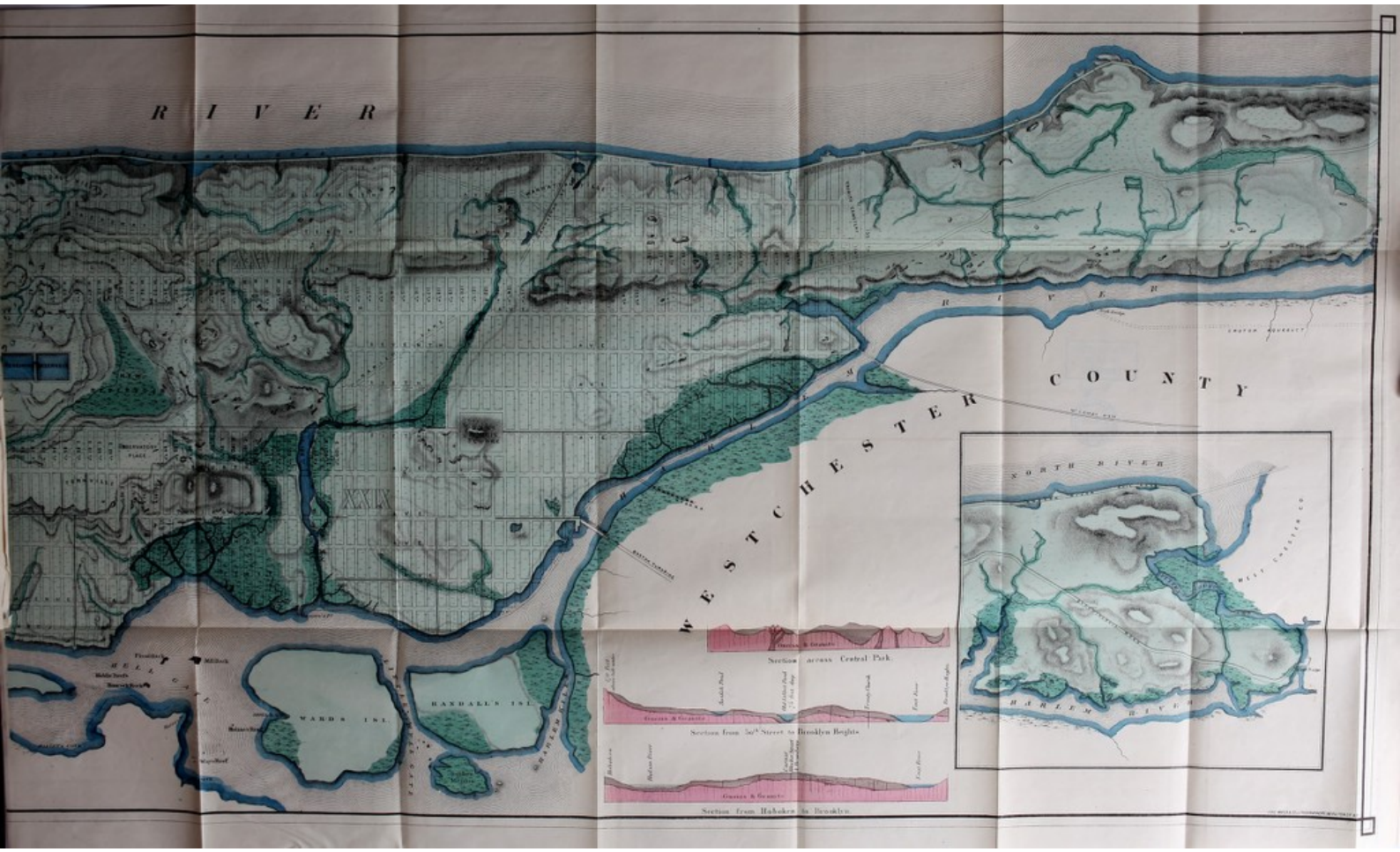


Entered according to Act of Congress, in the year 1865 by Egbert L. Viele in the Clerk's Office of the District Court of the United States for the Southern District of New York.

THE ROYAL SOCIETY
OF HEALTH
LIBRARY

Formerly

THE ROYAL SANITARY INSTITUTE
LIBRARY


R I V E R
WESTCHESTER COUNTY
NORTH RIVER
HARLEM RIVER
WARD'S ISL.
RANDALL'S ISL.
Section across Central Park
Section from 50th Street to Brooklyn Heights
Section from Hoboken to Brooklyn

REPORT

OF THE

EXECUTIVE COMMITTEE TO THE COUNCIL OF HYGIENE

UPON THE

PROGRESS AND PRESENT CONDITION OF SANITARY INQUIRY UNDER ITS DIRECTION.

THE Executive Committee presents to the Council of Hygiene and Public health of the Citizens' Association the following condensed summary of the progress, methods, and present condition of the several departments of sanitary inquiry that have been directed by the Council through this Committee, since the commencement of its work in the spring of 1864.

The Council having become permanently organized during the month of April, its Executive Committee was directed to prepare and put into operation a system of sanitary inquiry that should extend throughout the entire length and breadth of the city.* This task was required of the Committee as the first step in the initiatory duty of the Council, as an advisary body to the Citizens' Association, and also in view of the demand for sanitary improvements and the protection of the public health in the city.

To acquire information that should be sufficiently reliable and definite upon the various subjects relating to the sanitary condition of every portion of the city and its population, was, therefore, the first duty of the Council and of its Executive Committee.

With the approbation and support of the Citizens' Association, that had invited this undertaking, a system of sanitary inspection was devised and put into operation as soon as practicable. The special inspection of "fever-nests and insalubrious quarters"† was commenced early in the month of May; but the ultimate maturing of plans, the districting of the entire city, and the selection and organization of a competent corps of sanitary inspectors, were not fully accomplished until the middle of July.

* The term city, as employed in this and the subsequent reports, will be understood as referring to the entire island, however occupied.

† The term *fever-nest* having been introduced as being expressive of the conditions which mark the propagation of typhus and its kindred maladies, it will be employed as thus signified.

It was the unanimous opinion that the basis of sanitary reforms must be prepared by means of a thorough and systematic sanitary inspection by competent experts. By such inquiry it is that we can learn and properly judge of the existence and nature of the causes of the diseases that are avoidable and preventable. By this means their locality, their origin, the laws that govern their operation, together with the measures best adapted for their removal or prevention, must be ascertained.

This important work of inspection was, of course, intrusted to physicians who had already acquired valuable experience in the service of the public dispensaries and medical charities of the city. The following schedule of instructions, assignments, &c., issued to the inspectors, presents a catalogue of their names and the districts in which they labored:

BOUNDARIES AND DISTRIBUTION OF DISTRICTS

FOR

SANITARY INSPECTION UNDER DIRECTION OF THE COUNCIL OF HYGIENE.

FIRST DISTRICT—Comprising part of the First, and the whole of the Third Ward; and bounded north, by Reade Street; east, by Broadway; south and west, by the North River. Assigned to Dr. JOSEPH A. MONELL, 88 Greenwich Street.

SECOND DISTRICT—Comprising part of the First, and the whole of the Second Ward; and bounded north, by Peck Slip and Spruce Street; east and south, by the East River; west, by Broadway. Assigned to Dr. ISAAC L. MILLSPAUGH, 88 Greenwich Street.

THIRD DISTRICT—*Section A*—Comprising the Fifth Ward exclusively; bounded north, by Canal Street; east, by Broadway; south, by Reade Street; west, by the North River. Assigned to Dr. H. HARRIOT, 81 West Forty-third Street.

THIRD DISTRICT—*Section B*—Comprising the southern segment of the Eighth Ward; bounded north, by Spring Street; east, by Broadway; south, by Canal Street; and west, by the North River. Assigned to Dr. B. M. KEENEY, 23 Greenwich Avenue.

FOURTH DISTRICT—Comprising the Fourth Ward exclusively; bounded northeasterly, by Catharine Street; east, by South Street; southwesterly, by Peck Slip, Ferry Street, Spruce Street, and Chatham. Assigned to Dr. EZRA R. PULLING, and an Assistant, 813 Broadway.

FIFTH DISTRICT—*Section A*—Comprising the northern segment of the Eighth Ward; bounded north, by Houston Street; east, by Broadway; south, by Spring Street; west, by the North River. Assigned to Dr. EVERARDUS B. WARNER, 104 Macdougal Street.

FIFTH DISTRICT—*Section B*—Comprising the southern section of the Ninth Ward; bounded on the north, by Christopher Street, from the North River to Sixth Avenue; east, by Sixth Avenue to Houston Street; south, by Houston Street to the North River. Assigned to Dr. JAMES W. PURDY, 61 Macdougal Street.

SIXTH DISTRICT—Comprising the Sixth Ward exclusively; bounded north, by Walker and Canal Streets; south, by Park Row and Chatham Street; east, by Bowery; west, by Broadway. Assigned to Dr. WM. F. THOMS, 92 Madison Street.

SEVENTH DISTRICT—Comprising the Fourteenth Ward; bounded north, by Houston Street; east, by the Bowery; south, by Walker and Canal Streets; west, by Broadway. Assigned to Dr. P. Nolan, 138 Thompson Street.

EIGHTH DISTRICT—Comprising the Tenth Ward exclusively; bounded north, by Rivington Street; southeasterly, by Division Street; east, by Norfolk Street; west, by the Bowery. Assigned to Dr. J. T. Kennedy, 40 East Fourth Street.

NINTH DISTRICT—Comprising the Seventh Ward; bounded northwesterly, by Division and Grand Streets; east, by the East River; southwesterly, by South Street and Catharine Street. Assigned to Dr. Oscar G. Smith, 133 West Nineteenth Street.

TENTH DISTRICT—Comprising the Thirteenth Ward; bounded north, by Rivington Street; east, by the East River; south, by Division and Grand Streets; west, by Norfolk Street. Assigned to Dr. John C. Acheson, 89 Ludlow Street.

ELEVENTH DISTRICT—Comprising a portion of the Ninth Ward; bounded north, by Fourteenth Street; east, by Sixth Avenue; south, by Christopher Street; west, by the North River. Assigned to Dr. James L. Brown, 217 West Twelfth Street.

TWELFTH DISTRICT—Comprising the Fifteenth Ward; bounded north, by Fourteenth Street; east, by the Bowery; south, by Houston Street; west, by Hancock and Bleecker Streets and Sixth Avenue. Assigned to Dr. F. A. Burrall, 22 West Eleventh Street.

THIRTEENTH DISTRICT—Comprising the western half of the Seventeenth Ward; bounded north, by Fourteenth Street; east, by First Avenue (including both sides of that Avenue); south, by Rivington Street; west, by the Bowery. Assigned to Dr. Robert Newman, 16 University Place.

FOURTEENTH DISTRICT—Comprising the eastern half of the Seventeenth Ward; bounded north, by Fourteenth Street; east, by Avenue B; south, by Rivington Street; west, by First Avenue. Assigned to Dr. E. W. Derby, 168 East Fortieth Street.

FIFTEENTH DISTRICT—Comprising the Eleventh Ward; bounded north, by Fourteenth Street; east, by the East River; south, by Rivington Street; west, by Avenue B and Clinton Street. Assigned to Dr. James Ross, 54 Bank Street.

SIXTEENTH DISTRICT—Consisting of the southern half of the Sixteenth Ward; bounded north, by Twentieth Street; east, by Sixth Avenue; south, by Fourteenth Street; west, by the North River. Assigned to Dr. W. C. Hunter, 255 Sixth Avenue.

SEVENTEENTH DISTRICT—Comprising the northern half of the Sixteenth Ward; bounded north, by Twenty-sixth Street; east, by Sixth Avenue; south, by Twentieth Street; west, by the North River. Assigned to Dr. Guido Furman, 126 West Twenty-fifth Street.

EIGHTEENTH DISTRICT—Consisting of the southern half of the Eighteenth Ward; bounded north, by Twentieth Street; east, by the East River; south, by Fourteenth Street; west, by the Sixth Avenue. Assigned to Dr. H. M. Field, 37 Seventh Avenue.

NINETEENTH DISTRICT—Consisting of the northern half of the Eighteenth Ward; bounded north, by Twenty-sixth Street; east, by the East River; south, by Twentieth Street; west, by Sixth Avenue. Assigned to Dr. J. R. Mansfield, 68 Lexington Avenue.

TWENTIETH DISTRICT—Comprising the southern half of the Twentieth Ward; bounded north, by Thirty-third Street; east, by Sixth Avenue; south, by Twenty-sixth Street; west, by Hudson River. Assigned to Dr. E. H. Janes, 61 West Twenty-sixth Street.

TWENTY-FIRST DISTRICT—Comprising the northern half of the Twentieth Ward; bounded north, by Fortieth Street; east, by Sixth Avenue; south, by Thirty-third Street; west, by the North River. Assigned to Dr. JAMES L. LITTLE, 268 West Forty-second Street.

TWENTY-SECOND DISTRICT—Comprising the southern half of the Twenty-first Ward; bounded north, by Thirty-third Street; east, by the East River; south, by Twenty-sixth Street; west, by the Sixth Avenue. Assigned to Dr. R. L. PARSONS, 263 Fourth Avenue.

TWENTY-THIRD DISTRICT—Consisting of the Twenty-first Ward, north of Thirty-third Street; bounded north, by Fortieth Street; east, by the East River; south, by Thirty-third Street; west, by Sixth Avenue. Assigned to Dr. ELLSWORTH ELIOT, 48 West Thirty-sixth Street.

TWENTY-FOURTH DISTRICT—Comprising the southern half of the Twenty-second Ward; bounded north, by Fiftieth Street; east, by Sixth Avenue; south, by Fortieth Street; west, by the Hudson River. Assigned to Dr. ROBERT STEWART, 141 West Forty-fifth Street.

TWENTY-FIFTH DISTRICT—Comprising the northern half of the Twenty-second Ward; bounded north, by Eighty-sixth Street; east, by Sixth Avenue; south, by Fiftieth Street; west, by the Hudson River. Assigned to Dr. J. LEWIS SMITH, 147 West Forty-ninth Street.

TWENTY-SIXTH DISTRICT—Consisting of the southern half of the Nineteenth Ward; bounded north, by Fifty-ninth Street; east, by the East River; south, by Fortieth Street; west, by Sixth Avenue. Assigned to Dr. H. MORTIMER BRUSH, 7 West Forty-sixth Street.

TWENTY-SEVENTH DISTRICT—Consisting of the northern half of the Nineteenth Ward; bounded north, by Eighty-sixth Street; east, by the East River; south, by Fifty-ninth Street; west, by Sixth Avenue. Assigned to Dr. ALEXANDER HADDEN, 118 East Fifty-first Street.

TWENTY-EIGHTH DISTRICT—Comprising the western section of the Twelfth Ward; bounded north, by Harlem River and Spuyten Duyvel Creek; east, by Sixth Avenue; south, by Eighty-sixth Street; west, by North River. Assigned to Dr. L. A. RODENSTEIN, Manhattanville.

TWENTY-NINTH DISTRICT—Comprising the eastern section of the Twelfth Ward; bounded north, by Harlem River; east, by the East River; south, by Eighty-sixth Street; west, by Sixth Avenue. Assigned to Dr. J. O. FARRINGTON, 128 East One Hundred and Twenty-eighth Street, Harlem.

INSTRUCTIONS TO INSPECTORS.—(*Abstract.*)

THE LEADING POINTS OF SANITARY INQUIRY.

"[THE main object of the inquiries that are recorded in the Record-book is to procure and preserve accurate information concerning the sanitary condition of every portion of the city. Each inspector is expected to record his observations daily, &c., &c.] * *

* * * * * * * * *

* * * * * * * * *

"THE INQUIRY WILL RELATE TO

A.

"*The Block or Square Visited.*—Its boundaries; nature of the ground; drainage,

natural and artificial; nuisances and any sources of insalubrity; the prevailing character of the population inhabiting the block; the general condition and uses of the buildings, etc.;

B.

"*The Streets, Courts, and Alleys.*—The sewerage; the local drainage; the pavement; gutters; garbage; cleanliness, etc.;

C.

"THE INSPECTION OF THE HOUSE OR HOUSES IN THE BLOCK.

"The frontage, north, south, etc.; stories and height of each story; condition and material of buildings; dimensions of habitations, and rate of population to area and to air-space; water supply; house drainage, whether ample, independent, and in good keeping; cesspools; location and character of water closets; care of garbage, etc.; ventilation, external and internal; cellars and basements, and cellar population;

D.

"SICKNESS AND MORTALITY.

"Inquire concerning the prevalence and character of diseases in house and in neighborhood, and state whatever may be ascertained respecting sickness and death-rates.

* * * * * * * *

"On the first page of the Book of Records it is requested that each inspector draw a map of his district, and on the corners of each square place figures, indicating the number of the street; also that a red line be drawn through those streets in which sewers exist.

"The Records of Inspection begin on the second page. On the top of the page should be written distinctly the names of the streets between which lies the belt of squares first to be examined. Underneath should be written the names of the streets intersecting these and forming the different squares, as will be seen in the form of heading which accompanies these instructions. On the margin should be placed numbers corresponding to the several points to be reported upon, as contained in the printed list. [See Schedule of '*Subjects for Inquiry;*' * * * * *]

"THE INSPECTION.—This should be pursued in accordance with the suggestions relating to the scope and leading points of Inquiry, as presented upon the first page of the Record-book.

"It is recommended that each Inspector begin his examination at one corner of his district, and inspect a square at a time, the word square being here used, in a general sense, for any collection of houses bounded by three or more streets. This is considered preferable to following the line of any single street, and inspecting each side, because each square constitutes in itself a small sanitary district, and should be considered a distinct entity. Having completed the square, take the next one between the same streets, and so on, until the Inspector has reached the limit of his district, or the termination of the streets. Having completed this belt of squares, let him take the next series of squares lying parallel to it, and thus proceed until his district is completed. But it will be the duty of the Inspector, whenever he has information of the existence of fever, small-pox, or any special source of pestilence within his district, immediately to make a thorough inspection of the locality, in accordance with the forms provided for the Inspection of Insalubrious Quarters, and without delay to render said report to the Council of Hygiene; but the entry of the regular notes of inspection of such localities should not be made in the Book of Records until such square is reached in its proper place in the series. The proper memoranda of such inspections should be preserved in a separate book or on labelled slips until required for entry in the Record.

"When the whole or greater part of a square is composed of tenant-houses, it will generally be found that many of them are alike; and in such cases, while it will be neces-

sary to make, at least, a general Inspection of each house, it will be necessary to describe, in detail, the condition of only one or two, stating the fact (which is always to be verified by actual Inspection), that the adjoining houses, for a given distance, present the same general features; or, if different, state the essential points of difference. When a square or block is composed mainly or entirely of houses occupied by one or two families, the Inspection can generally be made in a very short time, and the record may be brief.

"REPORTS AND REQUESTS.—It is expected that each Inspector will be present at the weekly meeting, and that he will present, in writing, a condensed report or summary of the week's labors. It is also expected that each Inspector will write a full report of his whole district as soon as its Inspection shall have been completed, such report to contain a summary of all the points contained in each special report, and at the same time present a concise and faithful account of the sanitary condition of the district.

"Special and very minute reports should be made of tenements and localities in which fevers and other preventable diseases shall be found to prevail, which need not be entered in full upon the Book of Records, but are to be reported upon separately, and may be referred to by note.

"The extensive prevalence and diffusion of communicable and preventable diseases in this city render it desirable that each Inspector report such maladies as frequently and as fully as practicable. The Council expects to receive at least four such reports weekly from each Inspector.

"It is particularly desirable and necessary that each Inspector should so lay out his work, and prosecute his daily inquiries, as to complete the survey of his district within the period specified, and care should be taken not to expend time needlessly on points that are not essential.

"[For suggestions respecting further details of domiciliary inspection, see the forms for *Special Inspection, Reports of Insalubrious Quarters, and Pestilential Diseases*].

"[Paper for maps, blank forms, and books for reports and records, and any facilities that the Council of Hygiene or the Citizens' Association can supply for the furtherance of this work, will be furnished upon application at their office, 813 Broadway.

"Any Inspector who requires the presence or aid of the police in the prosecution of his inquiry, will obtain such aid by applying to the Superintendent of Metropolitan Police, or to Captain Lord, at the Police Headquarters.

"Insalubrious quarters that urgently demand immediate reform, should be promptly reported with specific statements, to the Council of Hygiene. And in the whole course of these inquiries, the Inspector will bear in mind that the improvement of the health and condition of the people, and the acquisition of accurate knowledge of prevalent diseases and their causes, is the main object of this sanitary survey of the city.]"

SYSTEM OF DAILY RECORDS.

EIGHTH WARD.—*Broadway to Mercer.*

1*st Square.* *Canal to Grand St.*

*Schedule of Subjects.**

1. ~~~

The inspectors were directed to make this inspection, as far as possible, a house-to-house visitation, and so thorough as to leave no cause of unhealthiness and no existing disease undiscovered and uninvestigated. The inquiry was to proceed systematically, commencing at a given limit of the district and progressing by contiguous squares until the work was completed. The following arrangement of the leading subjects of inquiry was issued for the purposes of facilitating the inspections and insuring uniformity in all the records and reports. Inspectors were, however, directed to develop each head by such subordinate questions as they might deem desirable:

SUBJECTS FOR SANITARY INQUIRY.

1. Nature of the ground.
2. Drainage and sewerage.
3. Number of houses in the square.
4. Vacant lots and their sanitary condition.
5. Courts and alleys.
6. Rear buildings.
7. Number of tenant-houses.
8. Description of a single tenement [of a family].
9. Description of a single tenant-house.
10. Description of a row of tenements. These descriptions should state—
    - *a.* Condition and material of buildings.
    - *b.* Number of stories and their height.
    - *c.* Number of families intended to be accommodated, and space allotted to each.
    - *d.* Water supply and house drainage.
    - *e.* Location and character of water-closets.
    - *f.* Disposal of garbage and house-slops.
    - *g.* Ventilation, external and internal.
    - *h.* Cellars and basements, and their population.
    - *i.* Condition of halls and passages.
    - *j.* Frontage on street, court, alley—N., E., S. or W.
    - *k.* Miscellaneous items.
    - *l.* Statement of sickness and mortality [according to the printed formula for insalubrious quarters].
11. Drinking shops, brothels, gambling saloons, etc.
12. Stores and markets.
13. Factories, schools, crowded buildings.
14. Slaughter-houses [describe particularly].
15. Bone and offal nuisances.
16. Stables, etc.
17. Churches and school edifices.
18. Prevailing character of the population.
19. Prevailing sickness and mortality.
20. Sources of preventable disease and mortality.
21. Condition of streets and pavements.
22. Miscellaneous information.

[*Each of these subjects to be developed by such subordinate questions as the Inspector deems*

desirable. The special points to which attention is directed under the 10th head, sufficiently illustrates the method of elaborating such questions.]

To each sanitary inspector a commission of appointment was issued in the following terms:

To _____

SIR:

The COUNCIL OF HYGIENE AND PUBLIC HEALTH, *reposing special confidence in your skill and ability to pursue sanitary inquiries and make reports thereon, hereby commissions you for such duty, under direction of its Executive Committee.*

(*Signed*) JOSEPH M. SMITH, M. D., *President.*

ELISHA HARRIS, M. D., *Secretary.*

The attention of inspectors was especially called to the importance of a thorough and exhaustive inquiry into the condition of insalubrious quarters and localities where pestilential diseases were found to be prevalent, and respecting the diseases themselves, particularly as relates to fever, infantile mortality, small-pox, etc. A form of special reports was accordingly issued to facilitate this branch of inquiry. The following is a partial abstract of the schedule of points requiring replies in such reports:

"REPORT OF PESTILENTIAL DISEASES AND INSALUBRIOUS QUARTERS.

"*Name of the disease reported*_____

_____*Physician.*

"*Dates of the visits and inspection*_____

"THE PLAN OF INQUIRY AND RECORD.

I. To trace and record the Medical history of the sick person.

II. To ascertain and record facts relating to the Family and other persons exposed to the patients and to the causes of the malady.

III. To report the Sanitary condition of the Domicile.

IV. To report the Statistics and Sanitary condition of the Population of that domicile.

V. To report upon the Sanitary condition of the Locality or Neighborhood and its Population.

VI. To preserve and make returns of these Records.

VII. To prepare on the spot the necessary outlines or data for the sketching of a Map or Descriptive Chart of the Domicile, Block, or Locality."

"I.

1. Name,.....
[If there are several patients here, insert all the names].....
2. Residence, Street and No.....
3. Age and Nativity.....
b. Period of residence in this city.....
4. Social condition; [married? unmarried? General condition of family? etc.].....
b. Occupation.....
c. Grade of intelligence; [ignorant, educated, depraved, etc.].....
d. Income and means of subsistence.....
Date when this patient or place was first seen by Inspector.....
b. When this case of sickness commenced?.....
History of the case or cases of disease.....
b. What the principal cause?.....
c. How and when exposed to do.?.....
d. What relation to do. had this patient's personal and domiciliary habits?.....
e. What other prediposing causes are known?" .....

"II.

Who, and how many persons, have been and now are exposed to the immediate causes of the malady?..... .....
How many cases of this malady have already occurred in this family, or among these persons?.....
What has been the *constant sickness-rate* among the persons over ten years of age here during the last six months?" * .....
[*And eight other questions.*]

"III.

What number of persons in this house?.....
b. Pro rata of ground area to each occupant? [in sq. ft.?].....
c. Average cubical space in the apartments to each person?" .....
[*And thirty-six other questions.*]

* "State what proportion or *percentage*, on an average, upon such testimony as can be obtained, is constantly sick: ⅛th, ⅕th, or 20 *per cent.*, &c."

"IV.

Natural drainage.....

Sewerage.....

Width and peculiarities of Streets.....

b. Width and peculiarities of Courts and Alleys.....

Special Nuisances in the locality" .....

[*And twenty-three other questions.*]

"APPENDED STATEMENTS.

"*Other Prevalent Diseases in the same Locality.*—Particular attention is to be directed to the extent and causes of any other malady that is found to be especially prevalent in the family, the house, block, or district that is being canvassed with reference to the disease that is recorded in the preceding pages. After filling out the following registry, relating to *Infant mortality*, make a brief record of any important facts that may be ascertained respecting the existence of *Pulmonary Phthisis, Scrofulous diseases—Marasmus, Ophthalmia, etc.—Erysipelas, Peurperal Fever, Still-births, etc., etc.* Let the range of such inquiries extend to all diseases that are ascertained to be peculiarly prevalent and fatal in the domicile or the locality reported."

[The foregoing form of Record fills eight pages.]

These special reports enable us to preserve in permanent form the valuable records they contain, and at the same time they serve as the basis for summary tabulations, specimens of which are herewith submitted for publication in the General Report. The statistics, distribution, and grouping of such pestilential diseases as typhus, small-pox, and cholera infantum, have been systematically studied, and the practical results of this labor will aid very materially in working out lasting benefits to the community. Yet both the plans and the result thus far attained by them must be regarded at present as simply the beginning of a system of Sanitary Inquiry and Sickness Registration that should be extended and sustained in such manner as to reach all those economical and humane results which an enlightened people have a right to expect and demand from sanitary science.

While making this sanitary survey the Inspectors have constantly endeavored to render their labors immediately beneficial to the inhabitants of insalubrious quarters by means of personal counsel during the inspection, also by communicating information to the Metropolitan Police; the Inspectors being furnished with the following blank-forms for the latter purpose:

The Citizens' Association of New York.

Office, No. 813 *Broadway,* ..... 1864.

To the Captain of the Sanitary Company, Central Department of Metropolitan Police:

SIR: I have the honor to inform you that the following complaint is made against an insalubrious place:

NATURE OF THE COMPLAINT, ...

NUMBER AND STREET, ...

DISEASE PREVAILING OR THREATENED, ...

.....M. D., *Sanitary Inspector for the Council of Hygiene.*

On Saturday evening of each week the physicians thus engaged convened for mutual counsel, the comparison of results, and for advice from a committee of the Council of Hygiene. The following extracts from circulars issued by the Executive Committee show the nature of the advice given:

"The Committee advises that the records and reports of current work of Sanitary Inquiry be fully written up at the close of each week and each month, so as to insure such recording *while the facts are yet freshly in mind.* And in pursuing a work that promises to be of such great and lasting importance, it is desirable that each physician engaged in it should, in his own field, strive to give the most scientific and thoroughly practical bearings to his hygienic inquiries and study.

"The Committee requests that the summary or review which each Inspector is expected to present, in writing, at the weekly meeting, comprise a brief statement of the progress and the specially interesting points made in the work. These summary statements are designed to interest and profit all who hear them read, and then to guide the Council in its own duties from week to week.

"It is desirable that each Inspector should observe a systematic method of recording in accordance with the schedule of subjects as numbered, and that each of the subjects for inquiry be expanded, according to the Inspector's views of utility, at each new point of observation. It is especially desired that the *rate of crowding* in Tenements upon limited areas be accurately noted, and that such crowded and insalubrious quarters be occasionally revisited.

* * * * * * * * * * *

"What have been the prevailing diseases during the past season, and to what causes and conditions are they in general attributable?

"1. Specify particular localities in which small-pox, typhus, typhoid, malarial and exanthematous fevers, cholera infantum, diphtheria, diarrhœal and puerperal diseases, erysipelas, and kindred affections, have been unusually prevalent, and give in full and minutely the local conditions influencing the rise, progress, and mortality from these diseases.

"2. What has been the constant sickness-rate in insalubrious quarters?

"3. Have you found insalubrious quarters where the constant sickness-rate and mortality were slight; and if so, how do you explain the fact?

"4. Have you found diseases emanating from immigrants? If so, specify the class of diseases, the extent of their prevalence, the circumstances under which they occur; with examples of their contagiousness.

* * * * * * * * * * *

"The Council fully appreciate the fact that the labors which have been undertaken by the gentlemen who are engaged in this work of Sanitary Inquiry, are inspired by noble professional and philanthropic zeal and purposes of public utility, and that these must be the leading incentives to that thoroughness of research which is to be the most essential condition of success in the effort to make these labors contribute to the public welfare and to the progress and usefulness of sanitary science."

The work of sanitary inspection was prosecuted uninterruptedly until the month of December (1864), and since that time the Inspectors have carried forward specific inspections relating to small-pox, typhus, and the sickness and death-rates in particular localities. This class of inspections is still in progress, and the results are most instructive and practically important.

Upon the completion of the sanitary survey of the city, the first of December, each of the Inspectors presented a concise summary of the results of his inquiry. These final reports of the Inspectors are herewith submitted to the Council. They present a well-prepared body of evidence relating to the sanitary condition of the city and its various classes of population. The Record-books containing the minutes of the Sanitary Survey, the maps and charts, the rough sketches and statistical reports of insalubrious tenements and quarters, and the special reports upon Pestilential Diseases, have been properly returned and committed to the keeping of the Council of Hygiene. They are of permanent value.

The character and value of the works which have been thus completed by the corps of Sanitary Inspectors, as well as the practical importance and faithfulness of the labors which the same gentlemen are still pursuing, can scarcely be over-estimated. They are alike honorable to the profession and to civilization.

While the work of sanitary inspection has been going forward by means of systematic agencies in the city, we have deemed it expedient to institute certain correlative lines of inquiry beyond the limits of our own civic population, with the design to obtain positive information regarding the spread of diseases from the city. For this purpose a circular was issued to physicians in neighboring towns, and in the cities and principal villages of the State of New York. Some of the fruits of this method of inquiry, beyond the city, have been embodied in the form of a chapter for publication in the Report of the Council.

Several of the charitable and religious missions of the city have rendered aid in some branches of our sanitary inquiry. This coöperation has been invited by a circular from us, containing the following statement regarding the relations which the physical and moral conditions of the community sustain to each other:

* * * * * * * * * * *

"We bear in mind the fact that the purposes and labors of the Sanitary Council, though relating specially to the protection of health and life, are entirely harmonious with the works and purposes of the Missionary, the Instructor, and the intelligent almoners of material and religious charities.

* * * * * "The Executive Committee of the Council of Hygiene solicits from all intelligent persons who are actively engaged in the religious and benevolent missions of the city, such information as may, from day to day, enable the Sanitary Inspectors and the Council to render their work more complete in all that relates to the search of insalubrious quarters and the causes of preventable disease and suffering. Missionaries, and other persons, who are laboring in assigned districts, will find it convenient to communicate directly with the physician who may be in charge of the Sanitary Inspection of that particular district. * * * * * *"

The coöperation of all practitioners of medicine in the city has been solicited, and blank forms for partial records of certain preventable kinds of disease have been supplied to nearly a thousand practicing physicians. The returns which have thus far been received from this source, have abundantly justified the adoption of the measures pursued by the Council of Hygiene in its sanitary survey

of the city. Of course it has not yet been practicable, from any such voluntary reports, to obtain statistics upon which to base an estimate of the constant sickness-rate of particular classes and localities: it is to the knowledge of prevalent diseases and their causes that such records will contribute most immediately. This has been well illustrated in the instances in which physicians have reported, from private practice, several cases of typhoid fever, dysentery, and diarrhœal disease in the very localities that had previously been reported upon by the Sanitary Inspector as particularly liable to such endemic maladies, in consequence of obstructed drainage, exposed sewage, putrefying garbage, etc.

The Executive Committee has rendered such aid as it could to the Council's Special Committee on Health Laws, and would now report that, in so doing, repeated editions of the tract entitled "*The Value and Necessity of Sanitary Improvement in Cities*" have been put in circulation, all circulars, memorials, and drafts of sanitary laws have been promptly printed, and the final copy resulting from the joint labors of the Board of Legal Advisers and the Committee of the Council has been printed and extensively distributed by the Council. It has been deemed expedient, also, to provide for the illustration of certain sections of the sanitary reports by means of careful surveys, photographing, engraving, etc. This has generously been authorized by the Executive Committee of the Citizens' Association, and the reports of the Sanitary Inspectors bear witness to the practical value of such additional work and expenditure. As neither the means nor the time were available for bringing out full illustrations in the manner attempted by the Inspectors, it is thought best to give simply a sufficient number and variety of *examples* to show many of the aspects of sanitary wants, such as the overcrowding and faulty construction of tenant-houses, the *culs-de-sac* and hiding-places of Typhus and other infections, and the character and encroachments of nuisances. The *Sanitary Chart* of the Fourth District, and the *Chart of a Region of Small-Pox and Typhus* in the Third District, present examples of what may be mapped out in reference to corresponding conditions in any of the tenant-house districts of the city. For the *Sanitary and Topographical Map* of the city we are indebted to Egbert L. Viele, Esq., President of the Board of Engineers of the Citizens' Association. It is designed to illustrate —1st. The primitive topography and water-courses of the Island of New York; 2d. The boundaries of the several Sanitary inspection districts; 3d. The plot of the Streets and Avenues of the city; 4th. The present altitude or elevation of each intersection of Streets and Avenues above tide-water level; 5th. The ancient tide-water line, and the portion of the city's area that has been reclaimed beyond that line—the "made-ground" along the river-sides; 6th. The present distribution of sewers throughout the city.

The intelligent and liberal views of the directors of the Citizens' Association have made it both practicable and desirable to give to the plans and the details of the sanitary work such breadth and efficiency as would best tend to render this service permanently beneficial to the public. This idea has been kept clearly in mind by the Sanitary Inspectors as well as by the Executive Committee of the Council. Being purely a voluntary undertaking, and having no collateral assistance from the so-called Health Department of the Municipal

Government, the methods of the work connected with this general Survey and Sanitary Inspection of the city have continued to be exclusively independent of any other aid than that which individual citizens, public-spirited physicians, and the chief officer of the Sanitary Company of the Metropolitan Police, have spontaneously given. To the officers of the Police special acknowledgment is due for their uniformly attentive and courteous regard to all communications and requests from the medical gentlemen representing the Council of Hygiene.

The first complete sanitary survey that has ever been made in the city of New York is now completed. The task has been executed by physicians. It will be practicable to publish but a synopsis or summary of the work. An adequate pecuniary compensation can never be rendered to the laborers; the consciousness of contributing directly and powerfully to the physical and the social welfare of their fellow beings is their richest reward. Familiar with the haunts of fever and other pestilential diseases, the Sanitary Inspectors have fearlessly penetrated the dismal and unwholesome quarters where infectious poisons and deadly maladies menace inhabitants and visitants, and from whence emanate the most dreaded diseases that find their way to the more favored districts of the city. And now, after completing the grand survey, writing up the records of inspections, and presenting final report thereon, they have entered upon a re-inspection of the *fever-nests* and *small-pox fields* that infest the city. The results of the latter effort are not yet sufficiently complete to be reported upon by the Council of Hygiene; but the fact may be stated here that accurate returns of one thousand five hundred cases of small-pox have been already received by the Executive Committee, in accordance with the following blank-form for reports:

STATISTICAL SUMMARY OF CASES OF SMALL-POX.

Reported by.....*M. D., in the*.....*Sanitary Inspection District.*

The street and number of house in which Small-pox is reported.
Number of cases now in progress here.
Number of cases that have occurred since October.
Date of the outbreak of Small-pox in this house.
Date of the outbreak of Small-pox in this square.
How was the contagion introduced? And whence?
Had this patient (or these patients) been vaccinated?
What number of persons in this family remain unprotected by vaccination?
What number of persons in this house remain unprotected by vaccination?
Population of the house. [By count or estimate.]
Population of the square.

Are articles of clothing, bedding, upholstery, or other portable materials, exposed to the infected air of the sick-room, or to contagion of the patient, and unguardedly removed from that room? [State any particulars that are important.]

Is any manufacture or trade carried on in the family or in the house, by means of which the contagion is liable to be communicated or spread abroad? [State particularly.]

State what *places* of public resort, shopping, manufacture, travel, or residence, in close

proximity to the infected apartment and patient, are particularly exposed or liable to the contagion here?

Has competent medical attendance been provided for the patient or patients?

Has any officer or agent of the City Government visited the patient or the house? What *official* advice and orders have been given?

Has any unusual restraint been placed upon ordinary intercourse with the family or the premises?

Remarks respecting the Inspector's visit and counsel.

A form of reports upon typhus corresponding in all respects with the foregoing upon small-pox, is also bringing in important results. The total number of cases of typhus and typhoid fever occurring among charity patients that have been reported and tabulated by the inspectors and the Secretary of the Council since the general survey was begun, to the present, is upwards of sixteen hundred. Another special form of report is bringing in important information respecting the daily and constant sickness-rate, and the percentage of mortality in overcrowded tenant-houses, neglected quarters, etc. The grand object of all such inquiry, inspection, and tabulation, is to acquire definite and reliable information which shall guide to wisely-directed efforts, upon a broader scale, and with more ample means for the diminution and ultimate removal of the preventable causes of disease and mortality.

The methods of sanitary inquiry and inspection that have been pursued, were adopted as the most available that could be put into operation at the time. Circumstances have determined certain features of this work which at another time, and under different auspices, would be most advantageously pursued in a different manner. The working machinery of a suitable system of sanitary inquiry and health government in such a city as New York, must be the growth of time. The Citizens' Association requested such information and counsel as physicians and hygienists alone could render; and it has been the constant aim of your Executive Committee to prepare such plans, and pursue such lines of inquiry, as would lead to the most practical and certain results in the interest of Health, Life, and Social Welfare to all classes of the population of New York.

Alfred C. Post, M. D.,
Isaac E. Taylor, M. D.,
Stephen Smith, M. D.,
Joseph M. Smith, M. D.,
Elisha Harris, M. D.,
Executive Committee of the Council of Hygiene.

New York, *January 9th*, 1865.

REPORT

OF THE

COUNCIL OF HYGIENE AND PUBLIC HEALTH,

OF THE

Citizens' Association of New York,

UPON THE

SANITARY CONDITION OF THE CITY.

In submitting this Report to the Citizens' Association of New York, the Council of Hygiene would state that its chief object will be to exhibit the practical conclusions which are clearly deducible from the accumulated records and reports of the Sanitary Inspectors, who have recently completed an extended hygienic survey and inspection of the city. As mentioned in the special report of the Executive Committee of this Council, herewith presented, the carefully-recorded observations and inquiries of the Inspectors furnish a vast fund of fresh and most valuable information. And, in view of the practical interest and the public importance of the facts contained in the voluminous records and special reports that have been received from the several inspectors, the Council has deemed it a duty to procure from each of them a final report containing a condensed summary of the facts and suggestions that have entered into their current records during the progress of their labors. These District Reports, thirty in number, are herewith submitted. They constitute a body of evidence that will abundantly corroborate all the statements which will be embodied in this general report by the Council. These reports of the Sanitary Inspectors embrace a great variety of details, statistics, and illustrations that cannot fail to attract the attention of thoughtful readers. The

records upon which they are based are altogether too voluminous for publication, but in this General Report the Inspectors' Records, as well as their reports as herewith published, will be employed for guidance and illustration.

To individuals and to communities HEALTH is a priceless boon. It is equally valuable to the poor and to the rich. Its influence extends not only to the social and moral condition and prospects of the individual, but to society at large, and public health becomes a public blessing. In view, therefore, of the fact that in great cities, and particularly in New York, both Life and Health are peculiarly jeoparded by various and very active causes, which forethought, inquiry, science, art, and good governmental regulations may remove or altogether prevent, this Council has cheerfully accepted the task of instituting a system of voluntary efforts, with the design to observe and point out that class of causes, with reference to practical measures for controlling them.

The first work in connection with the duty thus undertaken, has been to obtain and accumulate fresh and definite information by means of a carefully devised system of Sanitary inquiry. In its endeavors to accomplish this preliminary work, the Council has not overlooked the relations which health and the safeguards of human life sustain to the social and civic welfare of the community. Hence, in this first step of a public and philanthropic duty, the system of labor, and all its plans, have related to certain well-defined principles as well as to physical facts and physiological conditions.

SANITARY NECESSITIES AND EVILS OF CROWDED CITIES.

The progress of civilization in all countries is marked by the aggregation of a large proportion of their population in cities and commercial towns. However unfavorable to public health and to personal morals this circumstance may be regarded, it is manifestly a fact which we must accept, and duly estimate in all our plans for the physical and the social welfare of society; for it is an inevitable tendency of an advancing civilization, with its institutions of science and art, and with its ever augmenting commercial and social necessities, thus to centralize vast populations in cities. The city of New York affords at the present moment a striking illustration of this strong tendency; and not only has it already become

one of the most populous and densely-crowded cities in the world, but it is plainly its destiny to become at once the *most* populous and *the most overcrowded* of the great maritime cities. The evils, therefore, which now imperil health and life in consequence of overcrowding, etc., in this city, will tend to increase as the population increases.

In all the problems we may devise for the sanitary or the social welfare of this great metropolis, we must accept and duly estimate the fact that its vast population is already more densely crowded in its domiciles than that of almost any other city; and that the evils attendant upon overcrowding and the aggregation of vast numbers will be continually augmented as the population increases, unless the resources of Sanitary Science and the beneficent operations of wisely-administered sanitary regulations are interposed.

Sanitary Science with its practical applications having thus become indispensable to the welfare of populous communities, it may justly claim the attention which is bestowed upon it by the medical profession, and by all other classes that are concerned in the physical or the moral welfare of the community. This science is itself a practical resultant from the study of the necessities of healthful human life; and like the several departments of physical and physiological knowledge upon which it depends, it deals mainly with the facts which observation, experience, and rational deduction positively confirm.

The Council is fully convinced that the importance of sanitary knowledge and its practical applications is not properly understood, and that sanitary science is too generally regarded as something new and of uncertain merit. With a view, therefore, of presenting in a practical manner the facts concerned in affecting the public health of New York, the following Report is submitted, with such details of illustration, etc., as seem best adapted to extend the beneficial influences of such knowledge:

PREVENTABLE CAUSES OF DISEASE AND DEATH.

In a city like New York the *avoidable* causes of sickness and mortality are numerous and very active. There is reason for the conclusion that to this class of causes alone should be attributed nearly one-third of the deaths that have occurred in this city during the last ten or fifteen years. That is, had the available re-

sources of sanitary knowledge, and a wise administration of municipal and domestic regulations based thereon, been kept actively and very generally in operation, the greater part of the avoidable sickness and mortality would have been prevented. The annual *death-rate* in a community, considered with reference to its average, or with reference to its variations in a series of successive years, furnishes a sort of barometer of health and the chances of life in such a community. The fact will repeatedly appear in this Report that the chief causes of the excessively high death-rate in the city of New York are definite and *preventable.*

The distinction between the *preventable* and the *inevitable* causes of disease and of death is practically very important as a first step in the consideration of remedial and preventive sanitary measures. Careful observation and study of the facts relating to the leading causes of the worst diseases that afflict mankind, have clearly established the fact that a very large proportion of such maladies, especially as they prevail in cities, belong to the avoidable or preventable class, and that their principal causes can be described, located, and, to a great extent, or entirely, prevented. Whenever, therefore, in this Report, reference is made to *excessive* or high death-rates, or to preventable or avoidable disease, these expressions must be understood as referring to the sickness and mortality that are in excess of the proportion or percentage of disease and death which are inevitable, or necessarily incident to the present state of the population that is mentioned, had sanitary regulations and the principles of hygiene been properly regarded.

Says an eloquent and learned writer upon this subject:* "In certain parts of England and Wales it is found that, with a near approach to certainty, you may predict that from 13 to 17 persons will die annually out of each 1,000 of the population. In certain other parts or districts of the country, we are equally certain that the deaths will exceed 20 in 1,000; in a few districts they will very nearly approach or even exceed 30 in 1,000—the variations from year to year being in this case much more considerable than in the first case referred to." That is, we shall find that in whatever community or district the annual death-rate is lowest, there will be comparatively the least fluctuation; also that the ratio of *inevitable* mortality need not exceed **17** deaths annually to the **1,000** persons living.

* Dr. W. T. Gairdner's *Lectures on Public Health, etc.*, Edinburgh, 1862.

THE STANDARD OF HEALTH:—SICKNESS-RATE.

Owing to the absence of accurate statistical observations regarding the relative amount of sickness, and the length of the periods of illness in our city, our means for determining the ratio of sickness to health are imperfect. In schools and large workshops, where given numbers of persons are daily assembled for duty, or reported absent from illness, estimates upon a limited scale are occasionably made; but such statistics are not yet available for general deductions as regards the average sickness-rate in particular classes and at particular ages, much less do they afford a basis that is applicable for the entire population. But we possess two other elements of an estimation of the average or constant sickness-rate: one is derived from the statistics of the public medical charities of New York; the other element is derived from the experience of the Mutual Benefit and Friendly Societies of Great Britain.

As regards the latter element of an estimate of the sickness-rate, we may safely take the results of Dr. Lyon Playfair's study of the question, "What is the ratio of deaths to the total number of persons sick?" Dr. Playfair found that in the city of Manchester there were, in a mixed population at all ages, 11,587 deaths, to 324,041 cases of sickness. This gives *one death to twenty-eight cases* of sickness, slight accidents being excluded.* This ratio being assumed as a fair average for a civic and manufacturing population, we have a basis for estimating the probable sickness in a city like New York; yet it is plain that the ratio of sickness to mortality, like the ratio of sicknsss to health, is variable, and that *its* variations in different localities, and in different classes, sexes, ages, and occupations, are widely different. These questions have been elaborately investigated by competent inquirers abroad, with reference to the economical and proper management of various kinds of self-supporting and Mutual Benefit Associations.†

There are good reasons for the conclusion, that in the city of New York there occur not less than from twenty-five to thirty cases of sickness to every death that takes place; and that in those

* See Report of Health of Towns Commission, vol. 1, p. 448, 8vo Ed.

† See *Contributions to Vital Statistics: and A Development of the Rate of Mortality, and the Laws of Sickness*, by F. G. Neison. Also the works of Mr. Ansell, Mr. Finlaison, and Dr. Gairdner's Lectures on Public Health, pp. 311 and 312.

sections of the city in which the rate of mortality is greatest, the ratio of the total sickness to the total mortality is much higher than the average ratio and sickness-rate in the city.

This is a point of great practical importance; and without attempting in this place to present a statistical argument upon the subject, we will only refer to striking illustrations of the fact as presented in some of the records of the Sanitary Inspectors, published in the SECOND PART of this volume. In one of those house-to-house inspections the following facts were elicited:* In two contiguous tenant-houses fronting on Pearl Street, it was found that among seventy-four families, and three hundred and forty-nine persons of the ordinary laboring class, there were, upon the day of the inspection, one hundred and fifteen persons sick and diseased with various maladies; and further, that the death-rate for the preceding twelve months had reached the fearful maximum of one in nineteen of the total population. But it will be observed that while the death-rate was so alarming, the constant sickness-rate was even more excessive; nearly one third of the population of the two houses being sick on the day of inspection, which was during the healthiest period of the year.

Illustrations of the law here alluded to can be brought forward to an indefinite extent; the records of sanitary inquiry in the towns and cities of Great Britain abound with evidence upon this subject. In all places, and among all classes, in which there occurs a high rate of mortality, the standard of health is observed to be lowered in a corresponding and much greater degree, the ratio of the number of persons constantly sick seeming to increase with much greater rapidity than the ratio of mortality. We may state, in conclusion, upon this all-important question of the average or constant sickness-rate of the population of the city of New York: 1st. That the total amount of sickness and disease which exists at any period in this city may, in the absence of actual registration of disease, be justly estimated at from twenty-five to thirty persons sick for every death that occurs in the city. 2d. That the average duration of the illness of persons who recover from disease, is from ten to twenty days. 3d. That an excessive sickness-rate is at once a sure index and an active cause of diminished vital endurance, and of a shortened average period of

* See pages 78 and 79, Second Part.

life. 4th. That the ratio or average of inevitable sickness and disease, like the ratio of inevitable or necessary mortality, is to be ascertained in this city by properly studying the physical conditions and the history of the sickness and mortality of particular classes, and in particular localities of the city.*

The total amount of sickness that occurs among the dependent and pauper classes in this city during the year, is known to be very large. For many years the number of such sick and diseased persons appears to have increased more rapidly than the rate of increase of population; but it is found that the subject of sickness-rates has received no attention from the Health Department of the City Government, and that the Records of Medical Charities of the City remain unstudied by any official authority; consequently no positive deductions have yet been made respecting the ratio of sickness to mortality or of disease to health in the population of New York. But so far as trustworthy data have been obtained by the Council of Hygiene, it is found that the sickness-ratios correspond very closely with those which have been obtained by inquiries in Great Britain. In the present state of information upon the subject, therefore, the death-rate is an indispensable aid to correct deductions regarding the sickness-rate in New York, and conversely in regard to the standard of health in the community.† It should be borne in mind, however, that whenever the vital statistics of the city, and the records of medical institutions, are properly

* In the Metropolitan Police force, consisting of 2,014 men, carefully selected and peculiarly exposed, the *standard of health* during the year 1864 is thus described by the statistics of sickness and disability. The number of days lost by sickness in the force was, in the aggregate, equal to 67 years of time. This is equal to 3½ *per cent.* of the total force. That is, 3½ *per cent.* of the men were constantly sick (or wounded); 31 died, or 1 in 65; and the total number of cases of sickness was equal to 28 to each death, allowing an average period of illness of 16½ days to each man on the sick list.

† Says a distinguished British writer on Sanitary improvements: "One of the first great objects of sanitary organization should be *to watch* the death-rate; to watch it not only over a city or a parish, but in detail; to watch it with due regard to differences of age, sex, place, and *circumstances;* to watch it from month to month, and even from week to week; to watch it as affected by different diseases, particularly what are termed epidemic diseases, and such diseases as we have reason to believe to be in a great degree preventable; and this done, to make known the result from time to time to those who are chiefly concerned in Sanitary evils and their removal, so as effectually to bring home to the dwellers in darkness, ignorance, and disease, the immense significance of the facts taught by these figures."

gleaned, arranged, and studied, there will be another and more direct method of determining the constant sickness-rate and the average standard of health in the population.

MORTALITY IN NEW YORK.

The total number of deaths reported by the City Inspector, during the year 1863, amounted to 25,196. This was an increase of 3,952 upon the mortality of the previous year. The mortality of the year 1864 was greater by several hundred than in 1863. The death-rate in 1863 was a little less than 1 in 35; and in 1864 there was but slight variation from the ratio of the previous year. But as this estimate is based upon the assumption that the rate of increase of the population since 1860 has been about *five per cent. per annum*, which exceeds the rate of increase during the period from 1850 to 1860, the exact ratio can be accurately determined only after the absolute population of the city has been ascertained. Yet, for the purposes of our present inquiry, it suffices to know that for twenty-five years past the rate of mortality in this city has been increasing, and that it has fluctuated from the ratio of 1 death to every 39 of the population, to as great an increase as 1 death to every 27, and even to every 22½ of the living; and that our death-rate invariably keeps above the highest average of other American cities; it also continues to be higher than that of the largest cities of Great Britain and France.

The reference which is here made to the rates of mortality in other cities, might be followed up to some very important conclusions respecting relative degrees of insalubrity and mortality; but it must be admitted that the island and city of New York possess such natural advantages of salubrity that the comparison of this with other great cities, American or European, would be unequal, unless these natural advantages are at the same time properly estimated as being in favor of *a lower death-rate* and a higher average of health in this than in other cities. The fact that the rate of mortality in New York exceeds that of most other great cities, may justly be regarded as positive proof that the mortality in this city is excessive and unnecessary. There is, however, a more direct and satisfactory method of arriving at just deductions respecting both the degree and the local circumstances of the death-rate in New York. We select the following method as the

one best adapted to throw light upon the question of the death-rate in all its bearings:

Every citizen must have observed the fact that in certain portions of the city there exists an almost universal neglect of Sanitary regulations; the streets, courts, and alleys generally filthy, the gutters obstructed, the house-drainage defective, and the sewerage faulty; while in the tenant-houses of such localities are found numerous cases of typhus, small-pox, and all varieties of pulmonary and infantile maladies, which can be perpetuated and rendered fatal by overcrowding, domestic uncleanness, and lack of ventilation. In such localities, however great the advantages of natural salubrity may have been, and however well-fed and well-to-do the resident population, sickness is always very prevalent, and diseases are very fatal. On the other hand, there are portions of the city in which the streets have been well paved, and kept clean by private enterprise, or by the influence of the residents; where the dwellings are kept in a cleanly and not overcrowded condition; where the local drainage and general sewerage is good, and local nuisances of every kind abated; where, in short, there exists a good observance of Sanitary regulations that have been tacitly adopted and enforced by the local intelligence of the resident population.

For such a comparison, we will select two districts in which there is the greatest similarity of location and the natural conditions that should conduce to general salubrity of the resident population, and where, as regards the means of subsistence, the habits of industry, etc., etc., there are found the most points of analogy; but where, as we have just stated, certain removable causes of disease are absent on the one hand, and abundantly prevalent on the other. For this purpose we look upon the Sanitary and Topographical Map that accompanies this Report, and select the Third Sanitary Inspection District (A), and the Twelfth, which respectively comprise the Fifth and the Fifteenth Wards. We next refer to the Annual Report of the City Inspector for the year 1863, and find that the total number of deaths in the Fifth Ward was 1,144; while the total number in the Fifteenth Ward was 492. Referring to the census of these wards, we find that the population of the former ward, in the year 1860, was 22,265; and further, that during the preceding period of ten years, there had been a

decrease of two per cent. in the population of that ward. Estimating the population, in 1863, at 22,265, according to the census returns of 1855—though we know that the population in that ward decreased to two per cent. during the period from 1850 to 1860—the death-rate is found to be 1 death to 19 living. But there is an allowance to be made for the 373 deaths that occurred in the City Hospital, which is situated within the limits of this district. The actual death-rate in the resident population, therefore, was 1 in 28+ of the living. And now to show that this is not a particularly exceptional district of its kind, the death-rate of the Fourth Ward, which is the Fourth Sanitary District as described upon the Map, may be quoted. The death-rate in that Ward, in 1863, was about 1 in 25. In the Fifteenth Ward, in 1863, it was 1 in 60 of the population. And why does this wide difference in the death-ratios of these neighboring districts exist? The resident population have just about the same distribution into families with young children; they dwell in private houses, in hotels and boarding-houses, in about the same proportions in the several districts, with the single exception that modern tenant-houses have encroached but a little way upon the Fifteenth, or healthful district; yet in the district last mentioned, experience demonstrates that the expectation or chance of human life, counting all ages together, has more than twice, yes, two and a half times the value that can be claimed for the inhabitants of the insalubrious districts previously mentioned.

This method of illustrating the difference or variations in the rates of mortality might be extended to various other districts, or it might be applied to small localities, as to whole squares, or to particular dwellings and tenant-houses. Let the following suffice: In the Sixth Ward, which is noted for insalubrity, the death-rate, in the year 1863, was 1 in every 24 of the population. But great as the difference is between that local death-rate and the rate of mortality for the whole city, which was about 1 in 35 or 36, or between either of these rates and that of the Fifteenth Ward, there are found to be very marked differences in the rates of mortality in different localities and particular tenant-houses in the Sixth Ward itself. An illustrative instance has already been referred to upon a previous page,* and numerous cases of the kind will be found in the Reports of the Sanitary Inspectors.

* See page xlii., this Report, and p. 78 and 79, Part Second.

The important question now recurs: What is the necessary or inevitable mortality of the total population of the city? To this inquiry we need present no other reply than that afforded by the vital statistics of the crowded and busy Fifteenth Ward. It is entirely practicable to bring the standard of health throughout the city up to the present standard in that ward. Good Sanitary regulations would bring up the health-standard in some wards, the Twenty-first, or Murray Hill district, for example, to a point considerably higher than that of the Fifteenth. The entire city, with a death-rate of 1 in 60, which is the present rate of mortality in a central, crowded, but salubrious ward, the total mortality of the city would be at the rate of but 16,666 to the million, instead of ranging as it now does from 25,500 to 35,000 deaths to the million of the inhabtants. And if, for the present, the death-rate in the city were brought down to the standard which, by the agency of Sanitary works, was speedily reached in London, and which New York enjoyed fifty years ago, under better Sanitary regulations than are now enforced, namely, about 1 death to every 45 of the population, it still would be too high a rate of mortality, though it would be a saving of several thousand lives annually upon the present mortality.

In conclusion, we may state concerning this subject of standards of sickness and mortality in a city like New York, that however fluctuating and difficult to estimate, they are undoubtedly far higher than they should be in this city, and that both the causes and consequences are of vital importance as relating to economical, social, and moral questions that should receive the earnest attention of every citizen; for the preventable sickness, and the unnecessary mortality in our city, stand connected with the chief sources of the pauperism and vices of particular classes that most burden society; while, at the same time, the same causes of insalubrity operate with increasing pressure, and most unfavorably, upon the individual and the public health and happiness of the more favored classes of the population.

PREVENTABLE CAUSES OF DISEASE.

From the facts stated in the preceding pages, it is manifest that the causes of excessive rates of sickness and mortality are abundantly open to observation and study in various districts of

this city. We have seen that a mixed and crowded population inhabiting a ward (the Fifteenth) in the heart of the city, has an annual death-rate of less than two per cent., while in certain other wards of the city, where special and removable sources of insalubrity exist, the annual death-rate reaches, and even *exceeds four per cent.* of the resident population. In one case there is but one death in fifty and upward, and in the other there is one death in twenty-four of the inhabitants. These widely marked and sharp contrasts are observed no less in the relative amounts, or rates of sickness, than in the rates of mortality; and in the study of causes that induce and perpetuate the diseases which prevail in the insalubrious quarters, the physician finds the full explanation of such wide difference in the sickness and death-rates of particular localities.

Though, from the duties of his profession, the physician must give constant attention to the means of curing disease, nevertheless the importance of observing, and, when practicable, controlling the causes that produce sickness and excessive mortality, has ever been regarded as a paramount obligation of the medical adviser. The history of the medical profession in its relation to physical and social improvements in populous communities is full of instructive illustrations of the beneficial results of inquiry into the causes of prevalent and fatal diseases. In great cities, where our dwellings, our offices and warehouses, the articles of our food, the water and beverages we drink, the drainage, occupation and cleansing of the premises about us, and even the quality of the air we breathe, are determined by other persons, or but in small part by ourselves, there exists an incessant demand for watchfulness against the agencies which are detrimental to health or destructive to life. That a necessity for such watchfulness exists throughout the city of New York, is shown by abounding evidence in the Reports of the Sanitary Inspectors in the SECOND PART of this volume.

By referring to the testimony and the Records of the Sanitary Inspectors, it will be observed that particular diseases are described in connection with special conditions of insalubrity. Typhus fever and consumption are found in the overcrowded tenant-houses, and in dark and noisome quarters excluded from sunlight and fresh air. Cholera infantum, dysentery, diarrhœal diseases, and various typhoid maladies are found to prevail in badly drained and neglected streets and alleys, and in cellars, or in damp and filthy

domiciles surrounded by nuisances and poisonous effluvia. In such localities it has also been observed that scrofulous, rheumatic, and eruptive diseases prevail, and that the average or constant sickness-rate in the families and houses so situated is very high, the proportionate number of persons sick, or the total days of sickness, being three, five, or even ten times the ratio of sickness in the localities where better sanitary care prevails. And when the medical observer comes to inquire into the predominant causes of prevailing sickness, he finds that physical and rational evidences combine with overwhelming proof that these specific and removable physical conditions both produce and perpetuate such sickness. The chief causes concerned in producing the preventable class of diseases may be enumerated under two heads, as follows:

1. External conditions of insalubrity.
2. Personal causes of disease.

These two classes of causes are often associated and powerfully coöperative, but in this Report our attention will be confined to the external and positively removable sources of sickness and mortality. The worst personal causes of fatal disease not infrequently result from faulty external conditions, and they are at the same time so intimately associated with the worst moral evils and social misfortunes of the laboring classes. Therefore, in undertaking to discover and describe that class of the material causes of disease and public insalubrity which is removable by means of a Sanitary Police, it has naturally resulted that the subject of personal hygiene and social improvement could not fail to be thoughtfully considered; and in all the efforts that have been put forth for the removal of the merely external gross material sources of insalubrity, it is found that the correlative personal and social causes of prevalent diseases are the more clearly understood, and the more readily mitigated. Indeed, it may be said, in the words of an eminent writer on sanitary improvement, "the truth is, that, whenever we begin by reforming one thing, we end by reforming a great many more things in our social organization." The Sanitary Inspectors who have completed the survey upon which this Report is based, have not been unmindful of the correlation of the personal and social and the purely external causes of insalubrity; and for illustrations of the manner in which such correlation of causes has been studied, we might refer to the Reports of the Eleventh, Twelfth,

Eighteenth, and Twentieth Inspection Districts. But great and urgent as are the social wants, and the necessity for improvement in personal habits and self-care, in particular classes, the Council of Hygiene and its corps of assistants have regarded the discovery and removal of external causes of disease, and the suggestion of plans for rescuing and protecting the community from evils that can only be prevented or controlled by intelligent and coöperative efforts, as being the first object of sanitary inquiry. Improvement in personal and social conditions will follow close upon general hygienic provisions, and at the same time much needs to be done to diffuse popular information respecting the laws of health, and to impress all classes in the community with a sacred regard for human life, and for personal purity. The health missionary is always a pioneer to works of social improvement. In great cities the moral aspects of sanitary works are peculiarly important.

Although the removable causes of sickness and mortality are not exclusively confined to cities, they exist in more aggravated and multiplied forms, and are generally capable of being more definitely reached, and not less certainly removed, than in rural districts. Stagnant waters and undrained lowlands do not more certainly produce malaria or the ague poison, than do the unventilated and overcrowded tenant-houses invite and localize the poison of typhus, or the filthy streets, the reeking gutters and garbage boxes, and the untrapped drains and sewers, and the general neglect of domestic cleanliness, induce and intensify the typhoid, diarrhœal, and cholera poisons. Experience has proved that all these sources of disease are removable, and that the prevalence of such maladies is preventable. And as to the comparative facility and certainty of effecting the prevention of malarial disease by drainage and agriculture, and of removing the chief causes of febrile and wasting maladies, by means of thorough ventilation and civic cleanliness, experience is in favor of the latter. It certainly was a more expensive and difficult work to drain the bogs of Rome and the Pontine marshes, than was the maintenance of the local drainage and cleanliness of the city and its domiciles; and in the filling and drainage of the Minor Velabrum and the swamps of Lake Curtius, more time and treasure were expended than were required for the maintenance of the complete system of local drainage and cleanliness of the vast Colosseum that subsequently attracted

to the same locality, and held for days at a time, the tens of thousands of pleasure seekers whose health and lives, but for the means of drainage and purity there provided, would have been fearfully jeoparded.*

The nature of the marsh malaria may remain undetermined for another generation, yet its causes are now so well understood, that the rustic yeoman and the humblest villager know that fever and ague disappear under the influence of thorough drainage and agriculture, and that these simple agencies are as effective for the prevention of malarial maladies as quinine is specific in their cure.

The fact has long been established, that typhus fever owes its origin to overcrowding, uncleanliness, and want of ventilation; and that, when once the fever poison gains a foothold in domiciles where these evils prevail, its ravages are inevitable. In such localities the deadly poison will be perpetuated, while all classes of people who are exposed therein, peril life and health to themselves and their families. Typhus is preventable by means of cleanliness and a constant supply of fresh air, but without those agencies its infectious poison is uncontrollable in a populous city like New York. For fresh illustrations of the persistent adherence of the typhus poison in its primitive haunts in this city, we would call attention to the facts stated in the Sanitary Inspection Reports of the First,[1] Third,[2] Fourth,[3] Sixth,[4] Fourteenth,[5] Fifteenth,[6] and Eighteenth[7] Districts; while for an example of the sanative results of cleansing and ventilation where the fever poison had gained a foothold, we may refer to statements made by the Sanitary Inspectors of the Third, and Twenty-first District.

That the chief causes of that type of continued fever which is denominated typhoid or enteric can readily be controlled and removed by human agency, has been well settled as a medical fact; and that all the more prevalent kinds of diarrhœal maladies are induced

* The Colosseum comprised within its walls an area of 249,840 superficial feet; and it was necessary to provide conveniences for 70,000 to 80,000 persons constantly assembled to witness the games, etc., and who often remained riveted to the spot for days together. For a description of its system of drainage, see evidence given by Ed. Cresy, C. E., before the Metropolitan Sanitary Commission, pp. 333–335, First Report, 1847.

[1] See Second Part, pp. 6, 8, 9. [2] See Second Part, pp. 29–31. [3] See Second Part, pp. 52, 54, 56, 58, 62. [4] See Second Part, pp. 78–80. [5] See Second Part, pp. 168–169. [6] See Second Part, pp. 179–180. [7] See Second Part, pp. 216–218.

by causes that are removable, is also a well-established fact. Cleanliness, and the removal or avoidance of all kinds of putrefactive exhalations, together with proper care in the selection of food articles, are the indispensable means of protection from this class of diseases. Surely no intelligent person can deny that these necessary means of health can be provided by municipal authority, especially if such authority is supported by competent sanitary advice. True, in the city of New York the beneficent results of adequate care of the public health are looked for in vain; but this is only in consequence of the blind neglect of the official authorities of the city and the State to provide a proper system and administration of sanitary government. Yet, notwithstanding the want of adequate sanitary regulations, this city is blessed with a system of water supply which excels that of any other city of equal population upon the globe, and which for years past has exerted a most direct and important influence in protecting the inhabitants from the general prevalence of typhoid infections and diarrhœal diseases. Indeed, the Croton-water, in its universal distribution and abundant supply everywhere throughout the city, tempting to cleanliness of person and premises, preventing the use of water saturated with organic poisons from wells, and of worse poisons from stills, is to be regarded as the chief agency of sanitary protection which the city enjoys. Especially as regards the preventable diseases above mentioned, Croton-water is to-day the only well-administered agency of sanitary protection which the Government provides. But, alone, this agency is insufficient to guard against the incursions of the diseases here named; and, when house drainage and sewer cleansing are neglected, and when, in crowded courts and in obstructed gutters and cesspools, the filthy ooze and fever-breeding exhalations are kept up by means of waste water and putrefying organic matters, even the rich blessing of abundant water-supply becomes in particular instances a source of disease. Nevertheless, the value of the benefits outweigh the aggregate of the evils from the neglect, even in such instances.

The preventable diseases already mentioned caused, during the year 1863, a large percentage of the total mortality. The total amount of sickness from these diseases may properly be estimated in accordance with the principles laid down on a previous page. But these are but a few of the diseases which are most invariably

caused by preventable or removable causes. Too commonly they are regarded as inevitable maladies, that can only be averted by Providence. The Council of Hygiene expresses the rational convictions of the medical profession upon this subject, by stating that the chief causes are within the range and the *duty* of human control; and that neither the truths of science nor a true respect for the beneficent Deity and His will, can warrant the opinion that man is irresponsible for the occurrence of evils that can and ought to be prevented by human effort and obedience to the Creator's laws. Perhaps no clearer expression can be given to the truth relating to this subject, than that embodied in a reply of the Prime Minister of Great Britain, when he was urged to procure a royal order for a national fast, etc., in anticipation of an approaching visitation of cholera. In that communication, Lord Palmerston said that "the best course which the people of this country can pursue to deserve that the further progress of the cholera should be stayed, will be to employ the interval that will elapse between the present time and the beginning of next spring in planning and executing measures by which those portions of their towns and cities which are inhabited by the poorest classes, and which, from the nature of things, must most need purification and improvement, may be freed from those causes and sources of contagion which, if allowed to remain, will probably breed pestilence and be fruitful in death, in spite of all the prayers and fastings of a united but inactive people." *

The rapid progress of knowledge, the marvellous increase of human power over the elements of nature, by means of the applied sciences, the requirements of humanity, and an advancing civilization, together with the lessons and the light of past experience in great cities, combine to make plain the duty and the practicability of Sanitary works and regulations which shall redeem the city of New York from the scourge of fever and kindred maladies that now infest its tenant-houses and crowded districts.

The fevers and diarrhœal maladies have been mentioned as types of diseases that are produced and perpetuated by preventable causes, but there are still other classes of disease which are scarcely less preventable. One is even more so, viz., small-pox, which, since the discovery of Jenner, may be regarded as wholly preventable.

* Buckle's *History of Civilization in England*, vol. ii., page 467.

The entire category of the exanthematous diseases may be regarded as coming partially under the head of preventable evils; the excessive mortality that results from them may at least be regarded as being dependent upon removable causes. In reference to this subject, particular attention is invited to the statements which are embodied in the Sanitary Inspection Reports. The fearful mortality which attends the prevalence of scarlatina and measles in the crowded and neglected portions of the city, as well as the thoughtless and hazardous exposure of the active sources of these diseases to all classes of susceptible persons, in the hotels, and the public conveyances and streets of the city, may justly be regarded as a subject demanding public and official attention. A committee of the Council of Hygiene has already prepared a special report upon the points last mentioned.*

Small-pox is prevailing as an epidemic in New York during the present winter (1865), and so extensive was the epidemic at one period that the corps of Sanitary Inspectors under direction of this Council gathered up the records of fifteen hundred cases of variola and varioloid in the course of a few days. That such an epidemic of small-pox should have occurred in a civilized city in the nineteenth century, and with the decisive experience of two generations from Jenner's great discovery of the protective power of Vaccination well understood and accepted, is of itself an ignoble commentary upon the sanitary neglect and defective intelligence in administration that have rendered such an outbreak of that loathsome malady possible. In a subsequent section, under the head of Remedial Measures, the Council will have occasion to refer to the subject of Vaccination. The fact is universally conceded that the means of preventing an epidemic of small-pox are in our hands, and that by a simple and inoffensive proceeding, easy of application and certain in its results, every person in the city may and should be protected from the disease. From the time when Jenner introduced the application of his discovery, in the year 1798, and when but two years later its benefits were confirmed by experience in New York, there has been no lack of testimony to the fact that vaccination affords positive protection. "It was not,

* See the report of that committee, published by the Council of Hygiene; also a paper by Dr. Robert Druitt, upon the *Eradication of Domestic Pestilence.—Transactions of the National Association for Promoting Social Science*, 1860.

then, because Jenner's discovery was unappreciated among us that we have failed to enjoy to the full the immunity to be derived from it, but because we had long accustomed ourselves to consider that the prevention of disease, even when epidemic, was a matter chiefly of private concern." Left thus to the precarious chances of casual, voluntary, and entirely unorganized methods and occasions for applying this grand preventive against a dreadful malady, the good work that should have been done has not been, and will not be generally or faithfully done, nor can it be without the aid of an adequate system, authorized or provided for by municipal or State laws. Hence it is not strange that this city has for many years contained a great number of foci of the small-pox virus, and it is not strange that the scourge is now epidemic. In the month of April, 1864, when a member of this Council was preparing plans for a voluntary survey of the sanitary condition of the city, he visited five domiciles in a single hour in which small-pox was prevailing within fifty feet of the largest dry goods jobbing houses on the continent; and he saw children from whose faces the crusts of the pock had not yet fallen, passing back and forth through the narrow alley leading to their pestilential homes, and gathering unrestrained, and apparently unnoticed, about the entrances to the stores and offices in the vicinity. And upon inquiry at that time, the fact was ascertained that small-pox had been constantly prevalent throughout that neighborhood for several months, that a succession of tenants, incoming and outgoing, had kept up a supply of fresh victims to the loathsome malady. A chart of the district here referred to, will be found in the SECOND PART of this Report [page 31]. From the testimony of the Sanitary Inspector and persons residing in that district, it appears that the epidemics of these two diseases continued to prevail together, or in succession, in these domiciles for more than a year previous to January, 1865.*

* At last these epidemics have died out. The two diseases swept like a slow fire throughout the insalubrious quarters, until there was scarcely any susceptible material remaining; that is, these maladies have apparently burned out, as persons are not liable to immediate reattacks of either of them. By referring to the illustrative chart above mentioned, it will be seen that one or both of the diseases prevailed during the year in sixty out of the ninety-six houses in six small blocks; that there was fever in *fifty-two* of the houses; small-pox in thirty-four; and that there were only two domiciles in which the latter disease occurred, that were not also visited by the fever. Such is the history of the

The foregoing statement seems to illustrate the manner in which the removable causes of disease and mortality are permitted to exist in this city; and upon examining the Reports of the Sanitary Inspectors, the truth regarding sources of disease appears to be, that two classes of such preventable causes are continually active in producing and diffusing diseases throughout the city, and that these two methods of propagating disease are fearfully active and coöperative in particular districts. These strictly preventable agencies of disease are properly designated as—(1) the *Specific* causes; (2) the *Localizing* causes.

THE SPECIFIC CAUSES OF CERTAIN DISEASES.

The small-pox virus, always directly contagious, and also infectious to a considerable distance beyond the person of the sick, and the typhus poison which is also communicable by personal infection, are typical examples of certain specific causes of disease, which, if unguarded, will surely endanger the public health. In the city of New York these specific sources of infection have become so numerous, and so intensified by their increasing prevalence, that no district or street in the city is free from the peril of exposure to the maladies here mentioned. Within a single block from the elegant mansions of Stuyvesant Square, is a row of tenant-houses in which typhus has been constantly prevailing for more than a year past; from *one* of these houses, in which reside twenty families, the Sanitary Inspector reports that he has sent more than twenty patients to the fever hospital during the year 1864, and that *at least eighty cases* of the fever occurred in that house during the year. Again, in a group of crowded tenant-houses near the corner of Mulberry and Canal streets, typhus has prevailed very fatally, and almost constantly, the past three years; and during the first two months of the winter of 1865, twenty-three patients and five deaths from that fever were witnessed by the Sanitary Inspector in two of the smaller houses. In another quarter, upon a great thoroughfare, the infection of typhus has for a long time been so virulent and fatal, that in consequence of the panic it creates among the families which it enters, a perpetual succession of hasty removals both of families and fever patients has been kept up during

favorite haunts of fever, and the other preventable forms of disease. They seek the same habitations, because they are subject to the same localizing causes.

the year, and by that means the seventy-four domiciles of that single rookery have sent out an incessant and widely-distributed current of the typhus poison to other and distant sections of the city. Illustrations of the evil here referred to have been frequently presented to the attention of the Council. A single instance may properly be given in this place:

An Inspector reported the following facts that came under his observation: A man residing in the Eleventh Ward was sick with typhus fever, and died; a few days subsequently a daughter of the deceased, residing in the Seventeenth Ward, having visited her father while he was sick, was attacked by the same fever, and died. At the same time another daughter, whose residence was in Brooklyn, became ill with the fever she had contracted in her father's sick-room, and she died; another sister, residing in Avenue A, contracted the same fever while visiting the father and sisters when sick. Another relative, whose residence was in Sixteenth Street, also a son and another daughter of the first deceased patient, residing in Eleventh Street, were attacked with the same fever in consequence of their visits to the sick-rooms of the first and the second of the patients here mentioned. The Inspector reports that eight cases of the fever thus sprung from a common centre, and by distribution in as many different localities created as many new centres of infection and danger. Again, in the stated weekly Reports of another Sanitary Inspector, the following statement of facts incidentally appears: A young man residing with his parents in Thirty-Second Street, contracted typhus at the bedside of a sick friend in another block; his father, in turn, contracted the same fever from the son, and died; and there followed three other cases of fever in the same family. From this family the fever poison was communicated to visitors from a family in another block, in which family there occurred six cases in succession, and two deaths; and during that period the fever was communicated to two neighboring families in the same house. In the mean time some of these people, being alarmed at the spread and fatality of the disease, removed to another block, and carried the infection of fever with them. Next, the Inspector found the same fever spreading through families in Twenty-eighth Street, and was able to trace its introduction directly to the fountain of infection that has just been mentioned in Thirty-first Street. Thus, in a period of a few weeks the

Inspector found that seventeen cases of typhus in five families, and in four distinct localities, resulted from the careless exposure of the fever patients to promiscuous visitors. And all this was but the beginning of an evil, the records of which are still in progress.

Though, as will presently be shown, there are causes which localize and give increased virulence to fever and all other zymotic diseases in the city, the facts respecting the careless and unguarded exposure and dissemination of the specific personal sources of infectious maladies in the community should no longer be overlooked by the public authorities; much less should the people be permitted to remain uninstructed and unadvised concerning such sources of danger. The records which have been carefully and systematically made respecting the present epidemic of small-pox are replete with evidence that the utmost neglect of common precautions against the diffusion of small-pox virus has prevailed; as well as that, until the epidemic had created a panic, the public authorities had made no efforts to arrest the spread of the malady by advising and providing *vaccination*. Even in the midst of the epidemic the means that are provided are utterly inadequate, and they are unworthy of a civilized community. Neither the city nor the State has made any provision of trustworthy material and measures for vaccination; the community remains unadvised regarding the requisite precautions to be employed against the direct dissemination of the virus of small-pox, and no sanitary and police surveillance guards against the indiscriminate use of the public hacks, ferry-boats, railway-cars, restaurants, public thoroughfares, clothing manufactories, and crowded dwellings, in which the poison of this loathsome disease continues to be exposed. The facts upon this subject, as recorded and verified by the faithful Sanitary Inspectors, who are still continuing their inquiry under the direction of the Council of Hygiene, are such as should arouse the intelligent indignation of the public.*

* As the expediency of publishing details upon the subject here referred to is justly questionable, it may be best to state in general terms that during the past few years there had been an increasing negligence of all reasonable precautions against the exposure of small-pox patients, and their garments and all other materials, which by contact with the sick had become fomites of the small-pox virus. Public hacks and railway cars have been freely used by persons in all stages of small-pox; the clothing of patients who died of that malady have been sold to dealers in old clothes; and the Sanitary Inspectors further

It should have been mentioned that subsequently to the completion of the General Sanitary Survey of the city by the corps of Inspectors, whose reports are appended as a body of evidence in the SECOND PART of this volume, the same physicians have been pursuing a systematic course of inspection and inquiry concerning small-pox and fever. The results already attained in this inquiry present overwhelming proof of the fact that both the specific and the general or localizing causes of these two most preventable but fatal maladies have been and still continue to be criminally neglected by the municipal authorities; and further, that nearly all classes of the community remain in comparative or utter ignorance of the perils to which they are thus exposed.

The Council of Hygiene has deemed it a duty to make a record of cases illustrating the manner in which small-pox and fevers are spread from this city to other communities; and, in the course of inquiries upon this subject, very important and startling testimony has been given by medical practitioners in various portions of the State of New York, and by physicians in various cities and towns that hold daily intercourse with this city. The following instances will serve as illustrations of the truth that has been elicited upon this subject:

report many instances in which they found persons sick with small-pox in the same close apartment with tailors who were working upon woollen clothing. In other instances where the children of poor shirt-makers were sick with that disease, the new garments and the materials in hand were seen used as covering and wrappers upon the patients; everywhere there appeared to be no restraint upon the ordinary intercourse with families among the tenant-house population where small-pox was prevailing; and as the result of searching inquiry into the history of more than twelve hundred cases of this dreadful disease during the early part of the winter, 1865, the Inspectors found but two instances in which the infected domiciles had been visited by any officer or employé of the Health department of the city government. In one of those instances the so-called Health Warden stopped at the foot of a stairway forty feet distant from the poor tenant who had the disease, and delivered his orders as follows: "Put pieces of camphor about the clothing of those who are not sick, and occasionally throw some camphor upon the hot stove." In the other case the sanitary officer of the ward called at the entrance of a tenant-house in a densely-crowded district and instructed the poor families whose domiciles were smitten with the contagion, that they must not permit any person to know or to mention that there was small-pox there, and that if that injunction of secrecy were not strictly obeyed he would send them all to the pest-house!

Facts like these require no comment from this Council. They call for indignation as well as for a renewed effort of the citizens of this metropolis to provide some means for protecting the people against such evils.

Dr. Jenks S. Sprague, of Cooperstown, N. Y., reports the occurrence of twenty-six cases of small-pox in that town, communicated by a merchant who visited the city and put up at a hotel in which small-pox existed, and in which a patient died with the disease a few days previously. Besides the twenty-six cases in Cooperstown, there were many other persons infected with the disease, which they conveyed from that village into country districts. Dr. Frederick D. Lente, of Cold Spring, Putnam County, writes that "we have had three instances within the last few weeks of small-pox brought to this village by persons from the city of New York;" and he adds, "I think they get it in many instances from the city railway cars." Dr. Lente relates an instance that confirms this opinion. Dr. S. W. Turner, of Chester, Ct., reports three instances of the communication of small-pox from New York to his neighborhood. In one instance a Broadway merchant was attacked with the malady, and, returning to his country home, he conveyed it to his family there. Dr. C. C. Gay, of Buffalo, also reports the manner in which small-pox spread in that city from a woman who arrived in that city by railway from New York with that malady. Dr. C. C. Noble, of Waverly, Tioga County, N, Y., reports the case of a merchant who visited this city and put up at a hotel, and in an apartment in which there had been a patient with small-pox but a day or two previously. The merchant returned home with the same disease; six other cases and two deaths resulted directly from this source of the contagion. Dr. Jarvis, of Madison County, N. Y., reports a citizen returned from a business visit in this city, sick with small-pox, and that the contagion was directly communicated to fifteen other persons in the vicinity of his home, and ultimately to many neighborhoods beyond the village in which he resided. Again, it is reported by Dr. Stevenson, of Washington County, N. Y., that a man residing in Hammond Street, New York, being sick with small-pox at its stage of full eruption, took the cars to Albany and to his father's residence in the town of Cambridge, and that the contagion was immediately communicated to his father's family.

Without delaying to narrate other instances of this kind, the Council beg leave to refer to evidence upon this subject received from Dr. E. M. Snow, the well-known and faithful Health-Officer of the city of Providence, R. I. In the winter of 1855–'56 small-

pox was introduced into that city by a direct importation of the disease from New York, and 130 cases occurred in rapid succession from that one source. From 1856 to 1859 only seven cases of small-pox occurred in that city; six of those were known to have been contracted in New York. All classes and ages of the population of Providence had been vaccinated, and consequently the disease did not spread. But during the years 1859–'60–'61 and '62 small-pox continued to arrive from our city, and it spread to some extent each year. Dr. Snow remarks that "small-pox comes to this place (Providence) nearly every year, and usually produces an *epidemic of vaccination*, besides causing some extension of its own contagion."

Though small-pox is the most contagious and most readily communicated of all infectious maladies, there is abundant testimony to the fact that typhus fever, scarlatina, and some other sources of specific febrile infection, occasionally become the means of spreading their fatal poison to the towns and cities that hold daily communication with New York. At present there is neither any sanitary police surveillance nor any official advice and precaution against the propagation and wide distribution of these and other sources of infection.

Though it was not to be expected that a purely voluntary system of investigation, like that which this Council has undertaken, would bring forth immediately, and in a single season, all the facts that need to be set forth upon questions relating to the public health, it is plain that with facts like those here mentioned constantly accumulating and continually being verified, the time for reform has come. A great commercial city like New York, by permitting such evils to continue, not only puts in jeopardy the prosperity of trade and the welfare of the citizens, but also becomes guilty of a high crime against society at large.

In reference to the subject here presented, this Council would recommend:

First.—*That a system of faithful Medical and Sanitary Inspection should be maintained throughout the city, for the purpose of searching out and reporting to a central authority the existence and the sources of fevers, small-pox, and other pestilential diseases; and that, in the absence of a competent board of health, such duties of inspection, etc., should be maintained by volun-*

*tary organization; and, further, that such sanitary inquiry should be accompanied by the needed personal advice, and such other influences as would tend most certainly to diminish the evils thus discovered and reported.**

SECOND.—*That either by public authority and a competent Bureau of Hygiene, or by voluntary and private enterprise, there should be instituted such a system of general Inquiry and Advice concerning the occurrence and spread of contagious and dangerous diseases, as will not only enable the people of the city of New York to protect themselves against dangers that now exist in their midst, but also more effectually guard against small-pox and fever from external sources, and at the same time intelligently provide adequate measures to prevent the spread of such infectious diseases from this city to other communities.*

THE LOCALIZING CAUSES OF PREVAILING DISEASES.

It has seemed proper in this Report to dwell at some length upon the subject of those specific sources of disease that may most certainly be wholly removed or prevented by means of medical police authority. The next subject which presses itself upon our consideration may be best comprehended by presenting its leading points, under the general head of the Localizing Causes of Prevailing Diseases. By this term it is to be understood that there are causes which tend to determine and promote the prevalence of disease in particular localities.

The daily records of the medical gentlemen who have carried on the work of sanitary inspection in this city are full of testimony to the fact that the prevalence of fever, small-pox, infantile, diarrhœal and pulmonary diseases, together with an excessive sickness and death-rate, is invariably found associated with certain well-defined local

* A distinguished leader in sanitary improvement in Edinburgh thus sets forth the duty of "*organized sanitary inspection*, having for its object to ascertain facts and to press home the consequences of them upon the conscience of those chiefly concerned":

"Where we cannot legislate we can still teach; where we cannot command we can still warn. And neither the existence nor the absence of power, neither the expediency nor the inexpediency of interference by the authorities, can exempt us from the duty of knowing what is amiss, and diffusing that knowledge far and wide. For this is a case in which, literally and in the most indisputable sense, the people are 'perishing for lack of knowledge.'"

conditions which are unquestionably the chief causes of such extraordinary sickness and mortality. Time would scarcely permit us to review and give illustrations of the voluminous testimony that has been incidentally accumulated upon this subject by the corps of inspectors during the past season. Suffice it to state here that the existing fact thus reported by skilled and faithful physicians, simply confirms what reason should have taught every person, however uneducated, that filth, overcrowding, bad drainage, excessive humidity, imperfect supply of air and sunlight, neglect of excrementitious and decaying material, and the putrid exhalations from sinks, sewers, gutters, and dirty streets, will both produce and perpetuate disease; and that whatever sickness occurs in such localities will be more virulent and destructive than the same or similar maladies when occurring in places where such conditions do not prevail.*

* The records of all epidemics of cholera as well as of fevers, and the daily observations of physicians in reference to ordinary maladies, fully corroborate this view of the localizing causes of prevalent diseases. The following brief reference to a few instances will sufficiently illustrate this subject. We quote familiar facts from American records, and should remark that the history of epidemics and nearly all zymotic diseases in European towns fully confirms the conclusions which have been derived from medical observations in our American cities:

(1.) The first epidemic of cholera in the city of New York made its appearance first in the vicinity of Roosevelt and Cherry Streets; and nearly at the same time it appeared in Reade, Washington, and Duane Streets. The Five Points and the whole region of the Sixth Ward was visited by the epidemic with fearful virulence. "Rotten Row," in Laurens between Grand and Broome Streets, became another deadly centre of the malady. The vicinity of Corlears Hook, including portions of the Seventh and Thirteenth Wards, and another district including portions of the Eleventh and the Seventeenth Wards, constituted another great centre for the deadly sweep of the cholera. In all these places the local and removable conditions of general insalubrity were abundant.

(2.) In the cholera epidemic of 1849 it commenced its ravages at a grand centre of corruption and gross insalubrity in Baxter Street. Dr. Wm. P. Buell, the physician of the first established Cholera Hospital, thus describes the locality and the first victims of the disease. "No. 20 Orange Street" (now Baxter) "lies thirty or forty yards in a southeasterly direction from the 'Five Points.' The entrance to the rear lot is gained by an opening scarcely two feet wide, or more than six feet in height, pierced through the front house. Passing through this a distance of forty feet, you reach the rear lot, on which are two old and ruinous tenements: one a prolongation backwards of the front house, and the other standing across it at right angles; the adjoining house, an extension backwards in the same manner, thus cutting off almost completely the admission of fresh air. The small area that is unbuilt upon is covered with black pools of filthy water. The apartment where the first case occurred is a basement or cellar in one of these buildings." * * * "At my first visit, on the 16th of May, five human beings, one man and four women, lay

One of the Sanitary Inspectors ascertained that the death-rate in his district was as *one in twenty-four* of the population. A member of the Council accompanied that Inspector through several of the insalubrious quarters in that district, and found that a very large proportion of the resident population were sick, the percentage of persons sick ranging from ten to thirty per cent. of all the living. At that time the Inspector was able to point out, upon an area of about one-fourth of a square mile, no less than one hundred and fifty tenant-houses in which fever and small-pox was at the time prevailing or had recently prevailed, and where at the same time there existed all the evils just alluded to as the chief

upon the floor in different stages of cholera. There was nothing under them but mud and filth, and nothing over them but a few rags of the filthiest description. Civilization and a great city could scarcely afford a parallel to the scene." * * * "On the morning of the 20th of May two women were brought to the hospital from the 'Old Brewery.'"

For 14 days the disease was confined to this filthy locality. Next the disease appeared in a low and filthy quarter in Stanton Street and the Eleventh Ward. Then in the region west of the City Hospital, where typhus and small-pox have swept so fatally the past twelve months. The epidemic had thus gained headway and become fully established: its march was rapid and deadly.

As to localizing causes, there was but one opinion to be expressed. The epidemic sought out and lingered longest and most fatally in the very regions where typhus, small-pox, scarlatina, and other preventable diseases then prevailed, and do now most prevail.

(3.) In Philadelphia the cholera broke out and made some progress in the districts of Moyamensing and Southwark, where the work of cleansing was incomplete. But the citizens had anticipated the coming pestilence by the most comprehensive and energetic effort to effectually purge their city of all nuisances and all the known causes that produce or localize disease. 2,970 privies were cleansed; 340 houses were cleaned by authority; 188 ponds were drained; 66 rag and bone shops were closed, etc., etc.; and in all the city removed upwards of 6,000 separate sources of nuisance and disease. Cholera sent but 747 persons to their graves in Philadelphia, while in the city of New York it claimed 5,071 dead!

(4.) In the city of Boston the epidemic began in Hamilton Street, where 21 cases occurred, and spread through such places as Ann, Cove, Hanover, and Sea Streets. The officer of Internal Health of that city reported that the epidemic "domiciled itself, so to speak, in localities which have in common certain well-defined peculiarities." Crowding and local impurity were the chief peculiarities of those places. In the same localities—particularly in Hanover Street—typhus fever had previously been very prevalent.

(5.) In the city of New York the Common Council, acting as the Board of Health, appointed a Sanitary Committee, consisting of nine members of that Board, and by herculean efforts the city was finally cleansed and the pestilence stayed. In the final report of that Committee, after declaring that "we have no *Sanitary Police* worthy of the name," it is stated that "cholera may again assail us before we know it; and it is the dictate of true policy to be prepared in season to meet it, *and not cholera alone*, but any and every other malady which may be produced or aggravated by local causes."

localizing causes of disease. Over the same ground, in the warm season, swept cholera infantum, and during other periods of the year scarlatina, measles, and almost every kind of domestic pestilence prevailed in the same domiciles. Rheumatism, catarrh, consumption, and diseases of the eyes, the skin, and the bowels, are likewise always and most obstinately prevalent in the same localities and the same families.

The Inspector of the Fourth Sanitary District reports that in a certain tenant-house he found that in a population of 504 persons, in 71 families, there had occurred 20 cases of small-pox during the year, and that there had been six deaths from that disease; scarlatina had carried 16 of its young victims to the grave, and typhus had claimed a full share of adult lives. Upon the day of inspection there were found 8 persons sick with the last-named fever, 4 of small-pox, 7 of scarlatina, 4 of measles, 27 of marasmus, 12 of consumption, 8 of obstinate diarrhœa; and the total number of persons seriously ill in that closely-packed tenant-house was, at that time, 146, or about 29 per cent. of its population!

The local causes of insalubrity in and about the premises here described, are precisely those described at the commencement of this section. Filthiness, overcrowding, and a want of fresh air and sunlight, have served to localize and aggravate the diseases that have prevailed there; and at the beginning of summer in the year 1854, when the cholera reached our shores, it made its appearance first in the very place that is here described. And it is worthy of remark in this place, that its prevalence upon those premises was promptly arrested by means of thorough cleansing and a thinning out of the population. At the time of last inspection, each inhabitant had a pro-rata allowance of about fifteen superficial feet of area upon the ground, and but 275 cubic feet of air-space. At the beginning of the year 1865, the degree of overcrowding of that building was even greater by ten per cent. than the rate here recorded. The various causes of insalubrity that pertain to, or are accumulated about the tenant-houses here reported, are recognized by every intelligent physician as the agencies which not only originally produce many of the diseases that prevail there, but which also fix and insure the prevalence of every kind of fever and contagion that chances to be introduced from abroad. This sufficiently illustrates the meaning of the term "localizing causes of disease."

By turning to the District Reports in the SECOND PART of this volume, it will be seen that the Sanitary Inspectors have given peculiar and merited prominence to the local and removable evils that produce or determine the prevalence of disease. Says the Inspector of the Tenth District: "The high rate of sickness and mortality among the people of this district is undoubtedly attributable to two general causes, viz.: 1st. Their insalubrious surroundings, such as filthy streets, deficient sewerage, neglected privies, and ill-ventilated dwellings; and, 2d. The ignorant and careless habits of the people themselves." The Inspector of the Eleventh District reports a series of facts relating to the prevalence of dysentery, diarrhœa, and typhoid fever, which owed their origin and virulence to an uncovered and neglected sewer. The Inspector of the Thirteenth District reports in detail upon a great number of fever-nests, and insalubrious quarters, in and around all of which he found that the localizing agencies of disease were definite and destructively abundant. In the Eighteenth District, where fever and diarrhœa have been rife, the Inspector found, within a few hundred feet of wealthy and well-kept mansions, there were accumulated all the filthy and nameless evils that make a fever-nest, and in the midst of which typhus and domestic pestilence hold sway. Says the Inspector of the Twentieth District: "A very large majority of cases of cholera infantum occurred in rear tenements, from which are excluded the genial rays of sunshine, and where the atmosphere is loaded with the emanations from overflowing privies, filthy cellars, and undrained cess-pools."

The Inspectors' Reports, like their daily Records, are full of direct testimony upon this subject; and as the reader will find condensed statements relating thereto in the SECOND PART of this volume, it is not necessary to quote further from the results of the sanitary survey of the city. To the citizens who have encouraged and sustained its labors, it is proper that this Council should present not only the general conclusions that have been reached in those labors, but also such illustrations, both of the sanitary evils that now jeopard the public health, and of the agencies by which evils may be removed, as will most effectually aid the works of sanitary improvement which are immediately required in the city of New York. Hence it has been deemed expedient by the Council to add to the Inspectors' Reports various details of illustrations by

means of diagrams, etc., prepared from the original surveys made by an architectural and topographical draughtsman who has steadily been employed as an essential aid to the Sanitary Inspection. It has been the constant aim of the Council and its assistants to investigate the causes of insalubrity as they to-day exist in the city; and if in this Report, and in the body of evidence from the Sanitary Inspectors, there appears to be a great degree of prominence given to the localizing causes of disease and excessive mortality, it is a prominence that is fully justified by existing facts. Indeed, the actual circumstances and local conditions that now prevail as the chief causes of needless disease and mortality in the city of New York surpass belief, and can in nowise be fully represented by mere description. Such overcrowding and filthiness in extensive districts of a great city, such negligence of civic cleanliness and the localizing causes of disease, such an utter disregard of all precautionary inquiry and regulations to guard against the increase and diffusion of specific sources of pestilential maladies, probably do not exist elsewhere in the civilized world.

The Council would respectfully recommend, in view of the great importance of trustworthy and constant information and skilled advice respecting the local sources and the localizing causes of disease throughout the different sections of the city, that—

First.—*Physicians and all other classes of philanthropic and intelligent citizens should unite in the duty of maintaining a systematic effort to procure such stated and special inspections and reports of insalubrious quarters in the several districts of the city, as will furnish that definite and constantly revised knowledge of prevailing sickness and mortality, and the localizing conditions of disease, which will best enable the people to devise and apply means for the protection of the public health.*

Second.—*That all proper efforts be put forth to procure the establishment, and the successful operation, of an enlightened and efficient system of Sanitary Government and Advice.*

Third.—*That until such a system of Government and Advice shall have been established, as well as ever thereafter, physicians and all classes of the people in this city should use all practicable means and influences to induce the owners and lessees of*

tenant-houses and other property to remove and prevent the local causes of insalubrity pertaining thereto.

THE TENANT-HOUSES OF NEW YORK.

The sanitary wants and the social evils of this city have become fearfully centralized in the densely-crowded tenant-house districts. The most zealous philanthropy and the incessant efforts of religious teachers are striving to interpose such moral and social influences as shall mitigate the evils which for some time past have been rapidly augmenting in connection with the tenant-house system. The moral and the political dangers which stand connected with this subject are beginning to be appreciated by reflecting minds, but the actual extent and importance of the sanitary wants and physical evils of the tenant-house population as a class are by no means adequately regarded by the more favored classes of the community; while, with but few exceptions, it is lamentably true that the suffering classes—the tenant population themselves—from the very circumstances that surround them, remain comparatively unconscious of their own peril and disability, both as respects physical conditions and moral influences.

The officers and physicians of our medical charities have had constant occasion to note the peculiar sanitary wants and the prevalent diseases of the tenant-house class. The public dispensaries of New York annually provide medical care for about 150,000 persons, nearly all—probably more than nine tenths—of whom are inhabitants of tenant-houses; the various hospitals receive nearly all of their patients from the same class; while the almshouse and the penitentiary scarcely recognize any other persons than those long familiar with tenant-house life. We thus speak of the inhabitants of tenant-houses as constituting a class, and as being allied with the causes of sickness, pauperism, and crime. Circumstances incident to the growth and commerce of the city have nearly blotted out the private residences of the middle classes in the community, and with the loss of that class of domestic homes, the people that have been driven from them to the common tenant-house have become assimilated to the poorer class from which the almshouse, the hospital, and the public dispensaries are filled.

The tenant-houses of this city are unlike the habitations occu-

pied by the poorer classes in any other city, and principally in the following respects, viz.: 1. That the occupants have less personal interest in and control over the character, cleanliness, and surroundings of their domiciles than is usual in other cities. 2. That the rate of crowding, both as regards the allowance of superficial area and of air-space to each person, far exceeds the ordinary degrees of aggregation of the poorer classes in other cities. 3. There is less concern and expenditure for the welfare of the tenants, and at the same time a higher rate of rental for domiciles, than prevails in other cities. 4. There is relatively as well as numerically a vastly larger population dwelling in crowded tenant-houses in New York than in any other great city.

Not only has the total population of New York been doubled during the last twenty years, but that large portion—always a majority of the whole—that comprises the laboring and poor classes, has become more and more concentrated upon given areas and in particular streets and districts, until a degree of crowding has been attained which by itself has become a subject of sanitary inquiry and public concern.

At the time the Council completed its Sanitary Survey of the city, December, 1864, *there were* 495,592 *persons in this city residing in tenant-houses and cellars; the total number of tenant-houses was* 15,309, *and the average number of families to each of these houses was* $7\frac{1}{6}$, *including the poor families that take boarders, keep lodgers, etc.* To these aggregate numbers the Sanitary Inspectors report that another element should be added, viz., all of the smaller habitations, attics, stable-lofts, etc., where poor families are found stowed away, and having too small an allowance of area and air-space. The Inspector of the Fourth District (4th Ward), for example, reports that in addition to the 462 tenant-houses proper in his district, there are 252 other buildings that possess the attributes of tenant-houses, and in a great proportion of which the highest degree of sanitary want prevails. Were all this class of habitations included with the tenant-houses and underground residences it would be found that far more than half the population of the city is to-day inhabiting a class of domiciles which invite and localize the most disabling and fatal kinds of disease.

Cellar and garrets were once distinguished as the chosen abodes of poverty and disease; the New York tenant-house is now added

to the same list. But there have been constructed several improved dwellings of this class in which the provisions for domestic cleanliness and comfort, the supply of air and sunlight, and the prevailing low sickness and death-rates, afford sufficient evidence that a fair degree of domestic health and comfort may be secured even in a very dense population. That the rate of crowding in particular localities, and even throughout the entire region occupied by tenant-houses is too great, is rendered evident by a simple estimation of the facts relating to the subject. If we take into consideration only the so-called tenant-houses, that is, houses in which there dwell three or more families who hire their domiciles by a monthly rental, it will be found that these houses, being 15,309 in number, have been built upon about 850 acres of ground, including all the courts, alleys, and areas pertaining to them, exclusive of the paved streets in front of them. Including a proper pro-rata of the entire area of the public streets, the total superficial area allotted to these 15,309 houses, the 111,000 families, and the 480,368 persons that dwell in them, is about *two square miles.* That is, the tenant-house population is actually packed upon the house-lots and streets at the rate of 240,000 to the square mile; and it is only because this rate of packing is somewhat diminished by intervening warehouses, factories, private dwellings, and other classes of buildings, that the entire tenant-house population is not devastated by the domestic pestilences and infectious epidemics that arise from overcrowding and uncleanness. As now distributed, the tenant-houses of the city are nearly all found within an area of less than four square miles. Even this rate of crowding, including the other classes of population, and other classes of buildings that are interspersed, is so great as to have justly become a subject of momentous importance, and it calls for a thorough sanitary inquiry in regard to existing evils and impending dangers.

Such concentration and packing of a population has probably never been equalled in any city as may be found in particular localities in New York. In some entire districts, as in the Fourth, Sixth, and portions of the Eleventh and the Seventeenth Wards, the density of the population is far greater than in any parish or ward in London or any other European city of which we have definite knowledge. For example, in the Fourth Ward, the tenant-

house and cellar population, as distributed throughout the whole Ward, is all included within an area of about sixty acres, including streets, etc. This gives a population of about 192,000 persons to the square mile. And to this number there remains to be added that portion of the population which is not included in the tenant-house class. At the same time there are twelve acres of the same area occupied by storehouses and factories. The results of our Sanitary Survey in the Fourth Ward show that the tenant-houses and tenant-house population proper, *i. e.* the class that averages upwards of seven families to the house, are crowded upon a space of less than thirty acres exclusive of streets, or less than forty acres including street areas; and that this class, which, in that ward, out-numbers 17,611 persons, is now packed at the rate of about 290,000 inhabitants to the square mile. In that ward nothing is plainer than the fact that the overcrowding of the population is perilous to public health.

In the Sixth Ward the total population dwelling in tenant-houses and cellars amounts to 22,897, distributed over an area scarcely exceeding seventy-five acres. While in the Eleventh Ward there are 65,620 persons living in tenant-houses and cellars, and the rate of crowding is increasing throughout that ward with great rapidity; and in the Seventeenth Ward there is an aggregate tenant-house and cellar population of 66,207 distributed over one of the most important districts of the city.

These facts are introduced simply to show the growth and necessities of the poor and middle class population in New York, and also to illustrate the principle and the consequences of the remarkable concentration of these classes. If we compare these statements with the results of inquiry upon the same questions in the largest cities and most densely-populated districts in England, the rate of overcrowding in New York will become more apparent by the contrast. At the period when the great sanitary reform was begun in Liverpool, it was ascertained that in a particularly overcrowded and very unhealthy parish in that city, the packing of the population was at the rate of 138,224 persons to the square mile; at the same period there was a portion of the town of Manchester that was populated at the rate of 100,000 to the square mile; and all London 'metropolis' had 50,000 to the square mile. In a recent

report of a royal commission the following statistics are given respecting the most densely-populated districts of London:

Districts.	Rate of population to the square mile.
St. James, ...	144,008
Holborn, ...	148,705
St. Luke, ...	151,104
East London, ...	175,816

From the facts given in the preceding pages, and from statements embodied in the SECOND PART of this Report, as well as from the ordinary observations of reflecting citizens, the truth must be obvious that the poorer classes of the population in this city are becoming excessively aggregated, and that their narrow domiciles are becoming perilously overcrowded. To the practical consideration and treatment of this source of evil, therefore, citizens and all philanthropic persons must very soon give special attention. The sanitary necessities and the peculiar perils, both public and domestic, that stand related to this subject, cannot longer be neglected without seriously jeoparding the health and welfare of the city and working much evil to the State. How most successfully to mitigate the tenant-house evils and the perils of overcrowding, as they now exist, is truly a momentous question, and it is a still greater problem how best to provide suitable domiciles for the rapidly-increasing population of the city. That the poorer classes in the city must, to a very great extent, now and hereafter, reside in *multiple domiciles* or tenant-houses, is only too evident and certain. But it would be remarkably anomalous, in this age of progress in the practical applications of science and art, and of enterprise and success in overcoming the obstacles to human welfare, if no remedies were found adequate to remedy the evils we now both witness and justly anticipate. The principles of science and the labors of art upon which the hygienic protection of cities depends, are unquestionably adequate to meet any questions or necessities of a purely physical nature that are now pending or that may hereafter arise; and though Hygienic Works and Sanitary Regulations, adapted to our vast population and to the marvellous rapidity of the city's growth, are yet unknown and unprovided by municipal authority, this Council desires to avow the belief that, by the timely action of the intelligent classes of the people, this city may not only

be rendered one of the most salubrious of great cities in the world, but that it may and should be for ever kept in such a superior condition of salubrity. The physiological, the chemical, and the engineering and mechanical questions which stand connected with this subject, are not only sufficiently comprehended and well settled to meet any existing necessities of our civic hygiene, but the rate of progress in their practical application and in their expansion keeps pace with all human wants.

It is true that the rate of crowding of the population in particular districts of this city is already unparalleled and still increasing; and this renders the necessity of a comprehensive and effective system of Sanitary Government the more urgent; but there certainly ought to be no insuperable obstacle in the way of providing for an industrious and free people all the fresh air, sunlight, pure water, and wholesome food that human beings require; and certainly it is as possible as it is necessary for the proper authorities to enforce cleanliness and the observance of general sanitary regulations. *These are the essential requirements and conditions of domestic hygiene and public health.*

It is true that the tenant-houses of New York are rapidly becoming the nests of fever infection, and the poisoned abodes of physical decay. It is true that in the tenant-house districts a worse than Spartan fate awaits all children, and that cholera infantum, convulsions, scrofula, and marasmus hover with ghoul-like fiendishness about the dismal and crowded tenant-houses of the great mass of infantile lives in the city. It is true that we find the great body of the former middle class of society rapidly becoming absorbed into and allied with the poor tenant-houses class, and experiencing the lamentable evils that surround such homes as theirs; it is true that the tenant-houses of the city as a whole, as well as of particular districts, are becoming rapidly and perilously aggregated; and it is likewise true that moral, social, and political evils are fearfully augmenting and ominously threatening in our city, in consequence of all these unfortunate physical conditions. But is it not reasonable and true that insomuch as the causes of all these evils have been and are mainly physical—or at least always allied with material agencies which are under human control—in the same degree, and conversely and by redeeming conditions mainly of a physical nature, the evils we now deprecate,

and the impending perils we now fear, may be and should speedily be averted and effectually prevented?

As the whole subject of the sanitary wants of the laboring classes of this great city must ere long become, if it is not already, the most vitally important of all the great social questions and moral necessities that demand the attention of municipal and State authorities, and the efforts of philanthropists and social economists, it has seemed proper thus broadly to state the views which are entertained upon the tenant-house question by the Council of Hygiene. It is the wish of the Council to enunciate plainly and emphatically its views of public duty, as well as those of public necessity in reference to the urgent demand for well-considered, comprehensive, and prompt efforts to remove as completely as possible the physical evils that are now endangering domestic and public health in and near the tenant-house districts; and at the same time to aid in putting into speedy operation such plans as will most certainly provide comfortable and cleanly homes, that shall be socially and physically safe, for that rapidly-increasing portion of the population which at the present time crowd the tenant-houses and cellars of the crowded districts of this city.

The origin and growth of the evils that now characterize the ordinary tenant-houses of this city have resulted from simple conditions that ought to have been anticipated and provided for, and which may still be met. The report that was made upon the condition of these houses by a special committee of the Legislature, in the year 1857, faithfully describes the growth of the tenant-house system. That committee reported upon this point as follows:

"The tenant-house is the offspring of municipal neglect, as well as of its primary causes, over-population and destitution. As a city grows in commerce, and demands new localities for traffic and manufacture, the store and workshop encroach upon the dwelling house, and dispossess its occupants. * * * * * * * * * * * * As our wharves became crowded with warehouses, and encompassed by bustle and noise, the wealthier citizens, who peopled old 'Knickerbocker' mansions near the bay, transferred their residence to regions beyond the din, compensating for remoteness from their counting-houses by advantages of increased quiet and luxury. Their habitations then passed into the hands, on the one side, of boarding-house keepers; on the other, of real estate agents; and

here, in its beginning, the tenant-house became a real blessing to that class of industrious poor whose small earnings limited their expenses, and whose employment in workshops, stores, or about the wharves and thoroughfares, rendered a near residence of much importance. At this period rents were moderate, and a mechanic with family could hire two or more comfortable, and even commodious apartments, in a house once occupied by wealthy people, for less than half what he is now obliged to pay for narrow and unhealthy quarters. This state of tenantry comforts, however, did not continue long; for the rapid march of improvement speedily enhanced the value of property in the lower wards of the city, and as this took place, rents rose, and accommodations decreased in the same proportion. * * * * The spacious dwelling-houses then fell before improvements, or languished for a season, as tenant-houses of the type which is now the prevailing evil of our city; that is to say, their *large* rooms were partitioned into several *smaller ones*, without regard to proper light or ventilation, the rate of rent being lower in proportion to space, or height from the street; and they soon became filled, from cellar to garret, with a class of tenantry living from hand to mouth, loose in morals, improvident in habits, degraded or squalid as beggary itself. This, in its primary aspects, was the tenant-house system, which has repeated itself in every phase, as it followed the track of population from ward to ward, until it now becomes a distinguishing feature of our social state, the parent of constant disorders, and the nursery of increasing vices.

"It was soon perceived by astute owners and agents of property, that a greater percentage of profits would be realized by the conversion of houses and blocks into barracks, and dividing their space into the smallest proportions capable of containing human life within four walls. * * * * * * Blocks were rented of real estate owners, or 'purchased on time,' or taken in charge at a percentage, and held for underletting." *

Such has been the progress of the tenant-house system. Its evils and the perils that surround it are the necessary results of a forgetfulness of the poor, and of an absence of sanitary regulations and advice. That the evils and abuses of the system continue undiminished, is seen on every hand. Not only does filth, over-

* Report of select committee to examine the condition of tenant-houses in New York. Made to the Legislature, March, 1857.

crowding, lack of privacy and domesticity, lack of ventilation and lighting, and absence of supervision and of sanitary regulation, still characterize the greater number of them; but they are built to a greater height in stories, there are more rear tenant-houses erected back to back with other buildings, correspondingly situated on parallel streets; the courts and alleys are more greedily encroached upon and narrowed into unventilated, unlighted, damp, and well-like holes between the many-storied front and rear tenements; and more fever-breeding wynds and *culs-de-sac* are created as the demand for the humble homes of the laboring poor increases.*

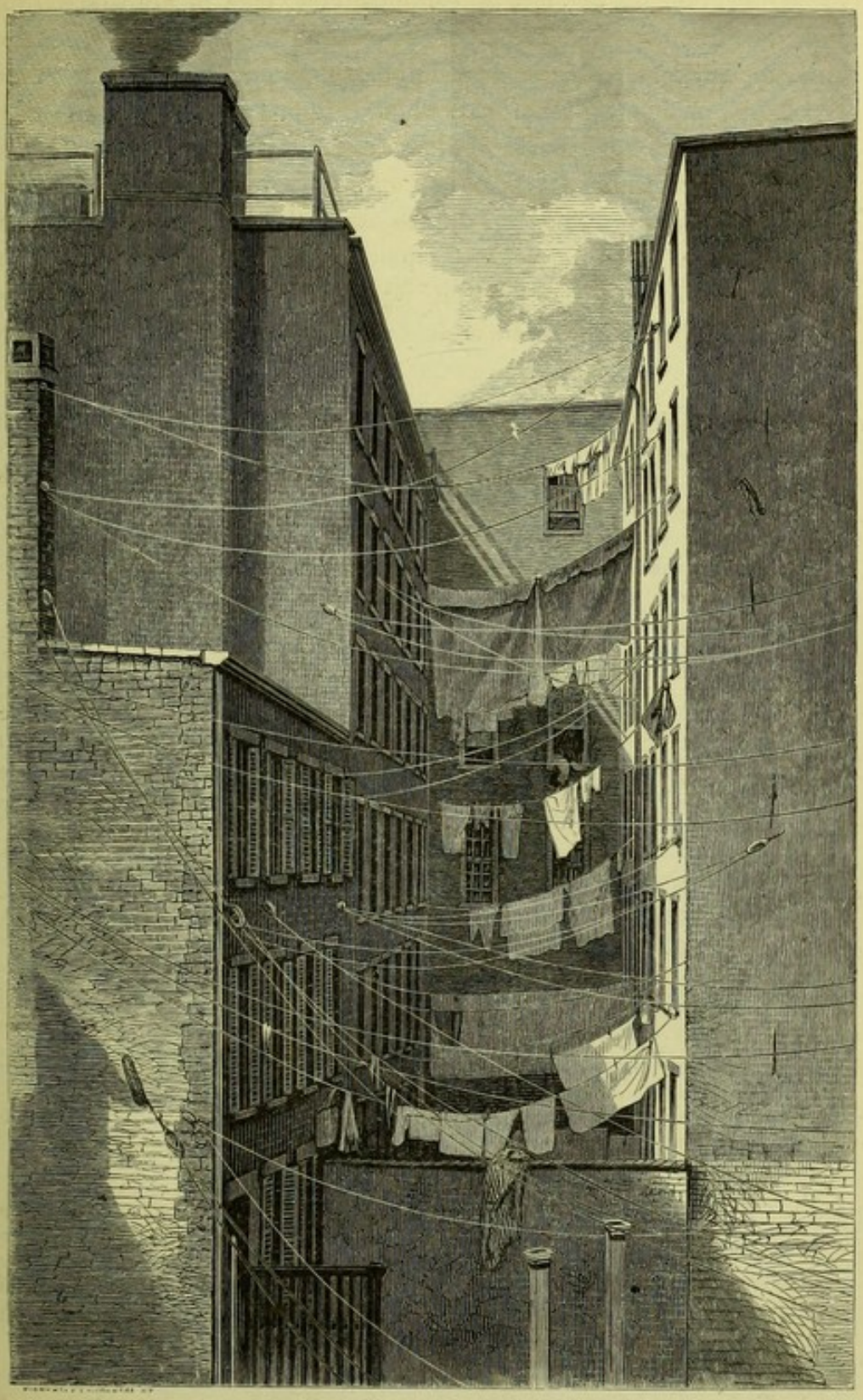
* The engraving upon the opposite page gives a view of a *cul-de-sac* formed by recently-constructed front and rear tenant-houses on Park Street, near the City Hall. The engraving is copied from a photographic view that was taken in the brightest sunlight that locality ever enjoys.

The following statistics of two houses, front and rear, pertaining to these premises were reported to the Council of Hygiene in the month of January, 1865, in the form prescribed for "*Special Reports upon the Sickness, Mortality, and Physical Conditions in Crowded Tenant-Houses.*"

Street and No. of the House.	Nos. 37 and 39 Park Street.
Character and surroundings of the House.	These tenant-houses are 6 stories in height, with a basement. An immense *junk store* and a 7 story tenant-house on the south side, extend the entire depth of lots, and thereby entirely shut off ventilation and lighting from that direction. There are stables at the back of the rear houses.
No. of Families in the House.	65.
No. of Persons in the House.	307. [With an allowance of 300 cubic feet of air-space.]
No. of Children in the House, under 10 years of age.	42.
No. of Children that have died during last 6 months.	6.
Total No. of Deaths at all ages during last year.	14.
Total No. of persons now *Sick* and *Diseased*.	77.
The Ratio and total Sickness in total population.	1 in 4 constantly sick.
The Ratio total Mortality in population for the year.	1 in 22.
Remarks.	Small-pox and typhus have existed for some time in these domiciles.

The statistics of the next tenant-houses, southward in the same block, a vast junk store intervening as just mentioned, are given as follows by Mr. S. B. Halliday, the faithful missionary to the city poor, and present Superintendent of the Five-Points House of Industry:

* * * "The lot on which this building stands is 48 feet 2 inches wide, by 91 feet



A TENANT HOUSE *CUL-DE-SAC.*

[Photographed by Anthony from a House-top in Pearl Street.]

The instances quoted below are not exaggerated examples of the tenant-houses of the city; on the contrary, they are truthful illus-

6 inches in depth. There is both a front and rear building. The front building, including the basement, is eight floors or stories. The basement is crowded with families, and there are two groggeries in the front portions of the next floor, families living back of the shops; so that families are piled up in this establishment one above the other, eight tiers high. In the front building I found 50 families, with two tenements or sets of apartments unoccupied. In these families were 52 men, 57 women, 30 boys, and 46 girls. The number of children which have died in these families is 38. The number of still-births, 11. The whole number of living children, 76; whole number deceased, 49; nearly two-thirds as many having died as have survived. In 13 of these families no children had been born, and in 23 families with children no deaths had occurred, so that 49 children have died in the remaining 14 families, an average of almost four deaths to each family. I give the ages of the deceased children:

2 of 11 years	2 of 17 months	1 of 5 months
1 " 9 "	2 " 14 "	2 " 3 "
2 " 6 "	1 " 13 "	2 " 2 "
2 " 4 "	2 " 12 "	2 " 1 "
3 " 3 "	1 " 10 "	2 " 3 days
5 " 2 "	1 " 8 "	1 " 1 "
2 " 18 months	2 " 6 "	11 still-born.

"The families in this building, with few exceptions, are from Ireland, and with as few exceptions, are Catholics. They are as a class possessed of more intelligence than the generality of the Irish people, the great majority being able to both read and write. The ages are as follows:

25 of 1 year	2 of 19 years	1 of 33 years
12 " 2 "	4 " 20 "	2 " 34 "
9 " 3 "	1 " 21 "	3 " 35 "
6 " 4 "	4 " 22 "	1 " 36 "
5 " 5 "	7 " 23 "	1 " 37 "
1 " 6 "	6 " 24 "	8 " 40 "
5 " 7 "	7 " 25 "	1 " 41 "
1 " 8 "	7 " 26 "	6 " 45 "
2 " 9 "	10 " 27 "	1 " 46 "
2 " 10 "	9 " 28 "	1 " 49 "
1 " 11 "	2 " 29 "	1 " 50 "
3 " 14 "	17 " 30 "	1 " 55 "
1 " 16 "	1 " 31 "	1 " 60 "
1 " 18 "	2 " 32 "	1 " 65 "

"In the rear building there were 17 families. In these 17 families there were 16 men, 22 women, 18 boys, and 7 girls; in all, 63 persons. 16 of these families are Irish, and one German. The ages were as follows:

5 of 1 year	2 of 14 years	1 of 34 years
1 " 2 "	1 " 15 "	1 " 36 "
2 " 3 "	1 " 16 "	2 " 38 "
1 " 4 "	1 " 20 "	5 " 40 "
2 " 5 "	1 " 21 "	1 " 41 "
1 " 6 "	1 " 22 "	1 " 45 "
2 " 7 "	3 " 23 "	2 " 48 "
1 " 8 "	1 " 24 "	1 " 49 "
1 " 9 "	1 " 25 "	4 " 50 "
3 " 10 "	2 " 27 "	2 " 55 "
1 " 12 "	4 " 30 "	2 " 60 "
2 " 13 "	1 " 32 "	1 " 65 "

trations of the predominant evils that at present characterize the tenant-house system. By referring to the evidence given by the Sanitary Inspectors, in the SECOND PART of the report, the reader will find these evils have in many instances become so excessive as to be the causes of the perpetual prevalence of domestic pestilence.* The records of sickness and mortality in particular tenant

"In two of these families no children had been born. In the other 15 families the children that had died exceed the number living nearly one-third. There were 25 living; and, including one still-birth, there had been 37 deaths of children in the 15 families. The ages of the these children at their decease was as follows:

1 of 26 years	1 of 5 years	1 of 9 months
1 " 24 "	2 " 3 "	2 " 6 "
1 " 18 "	3 " 2 "	1 " 5 "
1 " 12 "	2 " 18 months	3 " 4 "
1 " 11 "	1 " 16 "	2 " 2 "
1 " 10 "	1 " 15 "	1 " 1 "
1 " 8 "	3 " 14 "	2 " 3 weeks
1 " 6 "	1 " 10 "	2 " 7 days.

"The average age of these children at death was a fraction over three and one-third years. Not including the six oldest, the average age of the remainder is a fraction over one year.

"It is a shocking fact, that more children by one-third should have died than have survived in these families; yet I have no doubt that a critical examination of facts in regard to the deaths in the families of the five blocks, the census of which was taken by me, would have shown a nearly similar result. The whole number of persons domiciled on this lot was 248."—*Monthly Record of the Five-Points House of Industry.*

In Mulberry Street, near Chatham Square, is a "model tenant-house,"—so called, but really a human packing house—which in a recent inspection by the Council of Hygiene gave the following statistics:

Street and No. of the House.	5, 7, and 9 Mulberry, front and rear.
Character and surroundings of the House.	The old Baptist Church transformed into a Tenant-house.
No. of Families in the House.	59.
No. of Persons in the House.	313. [With about 400 cubic feet air-space to each.]
No. of Children in the House, under 10 years of age.	48.
No. of Children that have died during the last year.	7.
Total No. of Deaths at all ages during the year.	15.
Total No. of persons now *Sick* and *Diseased*.	78.
The Ratio of total Sickness in total population.	1 in 4, constantly sick.
The Ratio total Mortality in population for the year.	1 in 20¾
Remarks.	Typhus and small-pox have prevailed in this house for several months past.

* See pages 8, 9, 47–58, 77–79, 136, 177, 216–218, and 238–240. Second Part; Reports of the *Sanitary Inspectors.*

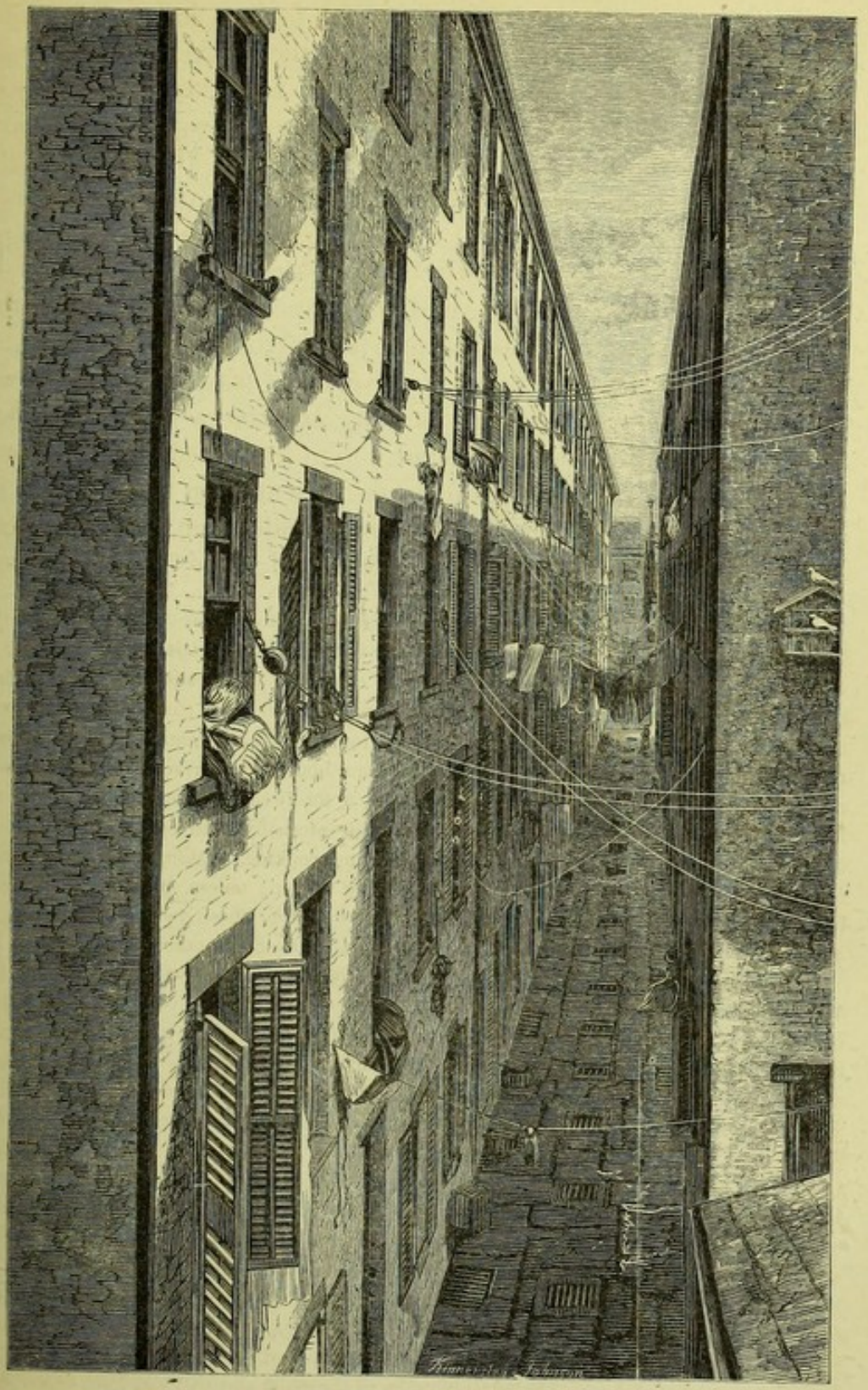
houses mentioned in preceding pages, sufficiently illustrate the fact that disease and death bear fearful sway among the inhabitants of this class of dwellings. This sad fate of the poorer classes in our city need not continue. It must not be permitted to become worse, nor to be irrevocably perpetuated. It now admits of remedial and preventive treatment. The excessive concentration and overcrowding of the poor and dependent classes in particular districts, and upon very limited areas of the city; the utter disregard of ventilation, and of the most essential conditions for promoting domestic comfort and health in the plans of tenant-house construction; and —what perhaps is the most essential, and most easily remedied of the sanitary wants of tenant-houses and their occupants—the absence of cleanliness and sanitary care of those houses, and the streets, courts, and alleys about them, are evils that urgently demand public attention. These evils must be remedied, and, as far as possible, they should be *prevented by faithfully-executed sanitary regulations.*

All the evils connected with the tenant-house system in New York have been steadily increasing for several years past; and although the system itself, as it exists here, is peculiar to this city, there is reason for believing that both the system and all its evils might be effectually controlled by the timely and well-directed efforts of the intelligent and wealthy classes of citizens. It is not the province of the Council of Hygiene to comment upon the faults and the criminal selfishness and indifference of the proprietors and managers of the great mass of tenant-house property as it is now held and managed in this city. Inquiries have revealed the fact that hitherto the plans, construction, and management of these houses have been left almost exclusively to the caprice and inordinate selfishness of men whose sole object has been to make small investments and a borrowed capital pay enormous advances, without regard to the poor tenants' welfare, or the public safety. A few worthy citizens and wealthy capitalists have given excellent examples of improved construction and care of such houses, but there is wanted a comprehensive appreciation of the peculiar necessities and perils of the city, and of the real wants, disabilities, and sufferings of the poorer classes of the population in consequence of the gross defects, overcrowding, and insalubrity of the miserable abodes of these classes. The limited area of the city, the unparalleled in-

crease of population, particularly of the foreign immigrant class, and necessitous conditions that induce the poor to accept such fever-nests and dens of death as avaricious and unscrupulous speculators have constructed solely for purposes of rapid gains, have become matters of public concern.* In view of the fearful indifference to some of the prevalent and yet most preventable evils that characterize the plans of construction and interior arrangement of tenant-houses, particularly as regards the gross herding of families, the obstruction of ventilation and natural lighting, the crowding of areas, etc., the Council has introduced various examples from accurate surveys that have been made under its own direction, and verified by the Sanitary Inspectors of the districts in which such examples are found. The engraved diagrams and views of some of these examples are presented in this Report, as illustrations of the evils here mentioned, and which, in the SECOND PART of this Report, are more fully described. The engraving upon

* Says a writer in the *Evening Post*:—"The tenant-house has become one of the institutions of this city; to build and own these barracks is a profitable speculation, in which men of honorable lives and kind hearts embark their means, and do not think themselves disgraced; yet we are told that the rents demanded are so enormous that from twenty to thirty-five per cent. are not uncommon returns for such ventures. Many of our readers have but a vague notion of what a tenant-house or 'barracks' is. It is commonly a structure of rough brick, standing upon a lot twenty-five by one hundred feet; it is from four to six stories high, and is so divided internally as to contain four families on each floor—each family eating, drinking, sleeping, cooking, washing, and fighting in a room eight feet by ten, and a bed-room six feet by ten; unless, indeed—which very frequently happens, says Mr. Halliday—the family renting these two rooms takes in another family to board, or sub-lets one room to one or even two other families!

"Many houses used for this purpose of 'herding' families together, were built for other uses; more recently, however, others have been built especially for this use. One of the largest of these 'barracks' has apartments for one hundred and twenty-six families! It stands on a lot fifty by two hundred and fifty feet, is entered at the sides from alleys eight feet wide, and, by reason of the vicinity of another barrack of equal height, the rooms are so darkened that on a cloudy day it is impossible to read or sew in them without artificial light. It has not one room which can in any way be thoroughly ventilated. The vaults and sewers which are to carry off the filth of the one hundred and twenty-six families have grated openings in the alleys, and door-ways in the cellars, through which the noisome and deadly miasmata penetrate and poison the dank air of the house and the courts. The water closets for the whole vast establishment are a range of stalls without doors, and accessible not only from the building, but even from the street. Comfort is here out of the question; common decency has been rendered impossible; and the horrible brutalities of the passenger ship are day after day repeated—but on a larger scale." See engraving from a photographic view of the court and barracks here described; page opposite.



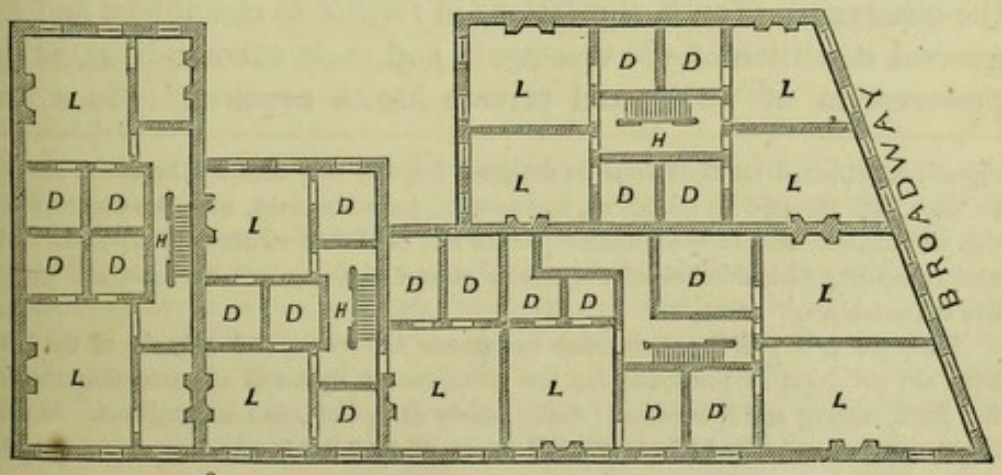
VIEW OF "GOTHAM COURT."

[Engraved from a Photograph by Anthony.]

the opposite page presents an illustration of the method of packing the greatest possible number of inhabitants upon the smallest possible space.

The evils which we have so freely illustrated, are so various and so numerous throughout the city, that each of the Sanitary Inspectors, excepting only the Inspector of the Harlem district, has reported a great number of examples, and notwithstanding the unusually dry and healthful seasons of the past year (1864) such examples of overcrowded, badly planned, and malconstructed tenant-houses have always been reported upon by these physicians as having a direct relation to certain prevailing diseases and an excessive death-rate. It is to be remarked also that all the evils of tenant-house crowding, and its attendant insalubrity, are rapidly encroaching upon the up-town districts, and that they are being thrust into the midst of streets and blocks hitherto occupied by private residences. Moreover it is to be observed that the dwellings of the middle classes, the artisans, clerks, and persons of moderate means and large families, are yearly becoming more and more embarrassed, narrowed, and insalubrious; and it may reasonably be feared that unless this important portion of the community puts forth some intelligently directed and combined efforts to procure the construction of dwellings adapted to their necessities, this city may ere long present the strange anomaly, for an American community, of the entire absorption of the artisan and middle classes into the common herd of the utterly dependent and tenant-house class.*

* The diagram here presented, furnishes a fresh illustration of the perilous evils to which even the best up-town tenant-houses are exposed. This is the *floor plan* of a



Improved Dwellings and Model Lodging Houses have begun to receive, in England, that practical attention which the wants of great cities demand; but in New York this subject needs to be more seriously considered than it has been hitherto, and it is manifestly necessary that definite and entirely practicable plans for the needed improvements should be suggested, adopted, and fully entered upon. The subject is not new, nor does the Council of Hygiene stand alone in thus urging the attention of citizens to it, and asking in the name of humanity, and in the interest of the public safety and an advancing civilization, that action be delayed no longer. The public mind must be aroused to the importance of the questions that stand connected with this subject; and the Council would take this occasion to refer to the very comprehensive and practical suggestions which have from year to year been put forth upon these questions by the Association for Improving the Condition of the Poor in New York. In the last Annual Report of that most useful society, it is stated that "large masses of the population are debased by the wretched condition in which they are compelled to live. These conditions should be improved; still, it would be true of many thousands, that if left to the uncontrolled indulgence of their reckless, filthy habits, they would convert a palace into a pigsty, and create 'fever-nests' and hotbeds of vice and corruption, under circumstances most favorable to health, comfort, and social elevation. To provide healthfully constructed houses for this semi-civilized class of tenants is necessary, but that of itself would be insufficient; neither would mere moral suasion and instruction suffice. The Argus-eyed vigilance of an intelligent and efficient police must be put in requisition to compel the observance of such regulations in respect to cleanliness and the general condition of the tenements and their surroundings, as the preservation of public and private health requires." In a pre-

recently-constructed multiple domicile designed for, and now occupied by twelve families on each *flat*. Situated on Broadway, and another desirable street, near the Central Park, this unventilated and fever-breeding structure will doubtless continue to be filled to its utmost capacity with families of the middle classes who pay well for rents, and wish to live respectably.

Here are twelve living-rooms and twenty-one bed-rooms, and only six of the latter have any provision or possibility for the admission of light and air, excepting through the family sitting and living-room; being utterly dark, close, and unventilated. The living-rooms are but 10 by 12 feet; the bed-rooms, 6½ by 7 feet!

vious report, the Executive Board of that Association states emphatically that "there is not a disinterested individual in the community so insensible to the claims of justice and humanity as to say that such dwellings as thousands of the poor now inhabit should be tolerated. If the owners of property are so utterly reckless of the comfort, morals, health, and life of others, and of the interests of the community, as to persist, as they have hitherto done, in the letting such houses, despite the knowledge possessed of their deleterious character, the Legislature should interpose for the protection of the occupants." *

Individual citizens, actuated by philanthropic motives, have already commenced the work of improvement in particular classes of tenements, as suggested by the Association for Improving the

---

* In a special report adopted and published by the Board of that Association, in the year 1853, the leading questions connected with the sanitary condition and wants of the laboring classes were ably presented, and the following among other remedial agencies were recommended:

"1. That the subject presents a forcible appeal to *capitalists* and *owners of real estate*, for they can alone engage in the work. Providence has made them to differ from others in wealth, that they may fulfil the obligation of 'doing good to others as they have opportunity.' Such an opportunity as rarely occurs is here presented. Though it required sacrifices, should not those whose wealth has been chiefly acquired by the toil of the poor, make them for such an object? But as sacrifices are not demanded, that plea is taken away, and on them is conferred the singular privilege of becoming benefactors to the poor, with pecuniary advantage to themselves.

"2. The subject demands *legislative intervention*. That legal measures should be resorted to, and may be legitimately exercised, there can be no doubt. For while the law zealously guards individual liberty, it is not less careful that the liberty guaranteed shall be so used as not to annoy others, or endanger public health. In other words, it recognizes no man's right to pollute the atmosphere of a neighborhood by breeding a pestilence in his own domicile. We are dependent upon legislation for supplies of water, construction of sewers, abatement of nuisances, and the inspection of numerous articles of food; also for the protection of health, property, and life; while it imperatively forbids under heavy penalties whatever is indirectly incompatible with the security of these important objects.

* * * * *

"Pure air, light, and water being indispensable to health and life, if tenements are so badly constructed as to preclude a proper supply of these essential elements, the law should interpose for the protection of the sufferers, and either close up such dwellings or cause them to be so remodelled as to be fit for human habitations. Thus, also, in the construction of new tenements, a certain amount of superficial area, height of ceiling, facilities for heating and ventilation, etc., should be furnished, under suitable penalties for neglect, and the number of inmates to each limited by law, if practicable, as is now done on board emigrant ships. No nuisances, moreover, should be allowed, and domiciliary cleanliness rigidly enforced wherever health was endangered by neglect."

Condition of the Poor; but there yet appears to be wanting such a plan or scheme of construction, of location, and general effort, as should effectually call out the popular interest, the investments, and the skill that are necessary; and also to induce the requisite combination of conditions to give the needed degree of confidence and success to the efforts that have hitherto been made. The Council of Hygiene does not deem it especially its duty to examine the merits of plans, or discuss questions of economy that govern the application of capital, as regards the dwelling improvements which are so imperatively required in this city. It is believed that the economical aspects of the sanitary question alone should awaken the attention, and secure the coöperation of capitalists, and of all classes of good citizens, in efforts to procure the improvements that are required for the physical welfare of the dependent classes. The adequate supply of fresh air, sunlight, and all needed facilities for insuring domestic cleanliness and home comfort is a sanitary question; and viewed in this light, it is a duty to state emphatically that the tenant-houses as a class are shamefully deficient in these essential requisites of health. The Sanitary Inspectors have reported upon the few improved tenant-houses found in their respective districts, and diagrams illustrating particular improvements will be found in the Eleventh, Seventeenth, and Twenty-first inspection reports, as published in the Second Part of the volume; but they simply show what improvements may readily be introduced into the worst of our tenant-barracks. No example can yet be shown of the successful attainment of all the essential conditions and appliances of healthy homes in a tenant-house on a large scale, or upon single lots and ordinary areas. In view of this fact, the Council has made some inquiry regarding plans that have met with success in Great Britain, where the whole subject of Dwelling Improvements has been carefully considered. In the overcrowded cities of that country the same questions that are most prominently presented in New York, are also under consideration. But there, capital, philanthropic effort, and scientific skill have combined to work out the problems that now command the same combination and same liberality here. The plans and efforts that have enlisted the minds of Prince Albert, Lord Shaftsbury, and the leading friends of humanity in England, have reached such maturity of results as to satisfy the highest anticipations and promises, both as

regards the saving of life, health, and public morals, and the actual compensation of the capitalist. So well convinced of this fact was Mr. Peabody, the well-known American banker in London, that his munificent gift for the benefit of the London poor has been already largely applied in Model Dwelling Improvements.*

The following facts appear to have been well established regarding means by which success has been, and is being attained in the schemes of Dwelling Improvement abroad:

First. That sanitary knowledge and architectural skill must be combined in the production of the necessary plans of construction.

Second. That, however sincere and devoted the philanthropy and zeal that advocates the improvements and procures the coöperation of capitalists in such improvements, the improved houses must pay a reasonable interest upon the capital invested, or but little progress will be made and but a small amount of relief be afforded to the classes for whose benefit the efforts are made.

All this, of course, is so reasonable that no further remarks upon either of the two propositions are required. It now remains to present a single example of the successful combination of all these essential conditions in working out the grand result. For this purpose it is believed, from recent reports, that the history and plans

---

* One third of the £150,000 given by Mr. Peabody to the London poor has already been expended in model tenant-houses and lands for that purpose. Five blocks of the buildings are completed. The essential features of the first one occupied are thus described:

"It is a stately edifice, more than 200 feet long, on Green Man's Lane, containing fifty-seven tenements, all occupied, and nine shops in Commercial Street, Spitalfields.

* * * * * * *

"The living-rooms throughout the building average 13 feet by 10 feet, and the bedrooms 13 feet by 8 feet, while their uniform height is 8 feet. The staircase and corridors are well lit with gas, and the fourth or top floor is occupied by laundries, areas for drying clothes, and as a playground for the children in wet weather, and by bath-rooms. There are lavatories on every floor for ordinary toilet purposes, and a bath can always be obtained by the short and simple process of asking the superintendent for the key of the room. In fine weather the enclosed yard is an admirable play-ground for the tenants children, and, a rule excluding all playmates from the outside being rigidly enforced, they are preserved from evil associates and consequent contamination. In the centre of the ground-floor, and dividing the shops pretty equally on either hand, are the offices and dwelling-rooms of the superintendent, an old soldier, whose duty it is to keep the books, receive the weekly rent, and see that the few and simple rules laid down by the trustees are properly observed. A copy of these is supplied to each tenant at the commencement of his term."

of Mr. Peabody's Improved Dwellings might properly be brought forward; but the plan of the first buildings constructed by the trustees of his gift extends over a larger area than would often be adopted in New York: The experience also has been brief. The example we prefer to present is that of Mr. Alderman Waterlow's "Healthy Dwellings for the Industrial Classes." On the opposite page is shown a diagram of the Floor Plan of the first tenant dwelling erected by Mr. Waterlow in Finsbury Square, London. It was designed for and is occupied by the families of industrious men with small means.

This plan is presented as an illustration of success in the attainment of the requisite conditions for healthy homes in a tenant-house. In this house twenty families are accommodated, and can enjoy that kind of domestic comfort and convenience which is essential to physical and social health.*

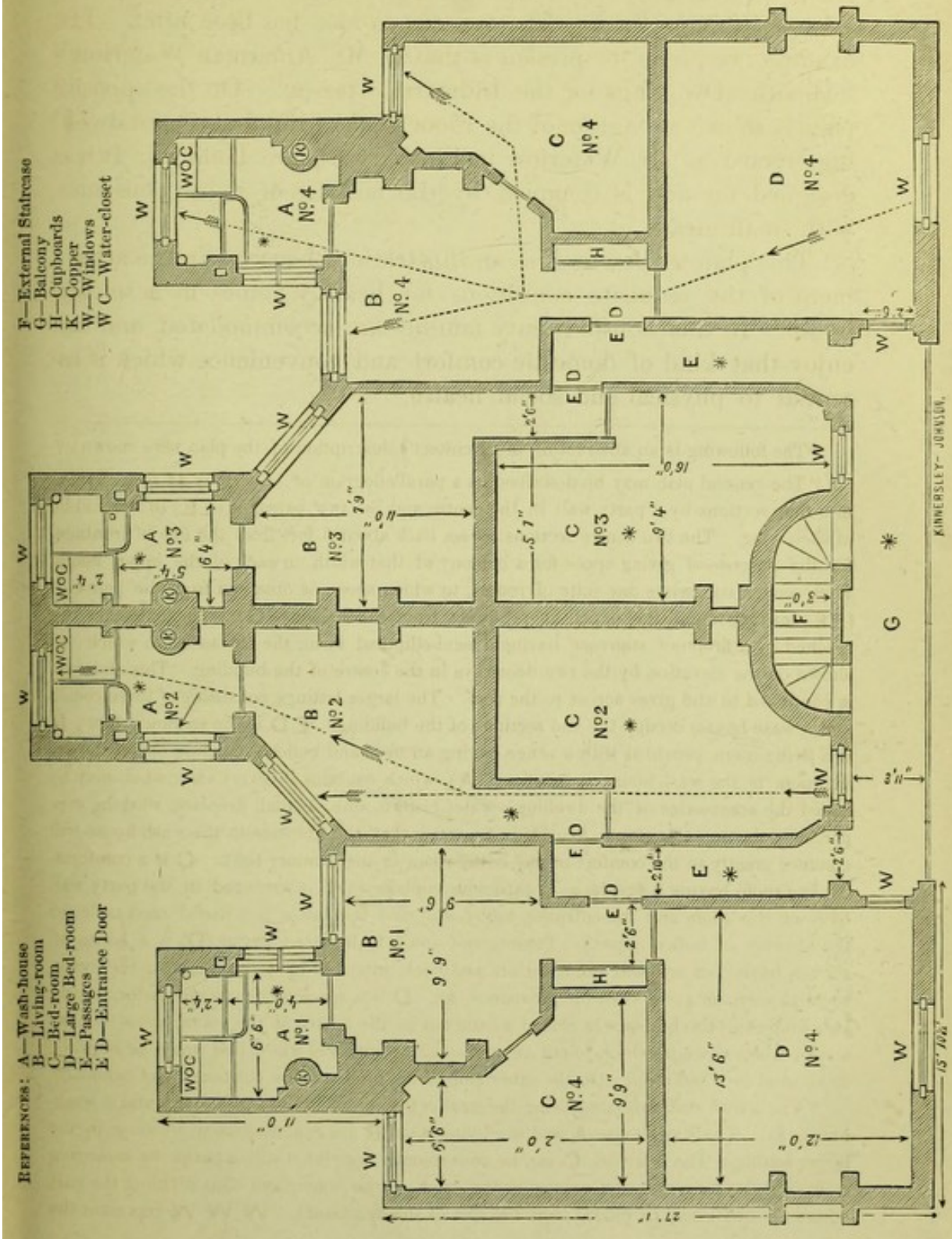
---

* The following is an abstract of the architect's description of the plan here shown:

"The general plan may be described as a parallellogram of 56 feet by 44 feet, divided into four sections by a party wall in the centre and the two passages (E E) in the middle of each wing. The two centre sections are set back about 3 feet from the line of frontage, for the purpose of giving space for a balcony of that width on each of the upper floors. Each section comprises one suite of rooms, to which access is obtained from the passages (E E) leading (on all the upper floors) direct from the balcony (G). The balconies are reached by a fireproof staircase having a semi-elliptical form, the entrances to which are shown on the elevation by the two doorways in the centre of the building. This staircase is continued to and gives access to the roof. The larger lettings, consisting of three rooms and a wash-house, occupy the end sections of the building. E D is the entrance door; B is a living-room, provided with a range having an oven and boiler. Leading out of the living-room is the wash-house or scullery (A), which contains in every case what may be called the accessories of the dwelling—water cistern, sink, a small fireplace, washing copper, dust-shoot, water-closet, &c. It is expected that the fireplace in the wash-house will conduce greatly to the comfort of the living-room in the summer time. C is a comfortable bed-room having a fireplace; a capacious cupboard (H) is arranged in the party wall between this room and the entrance lobby, and over the latter is a useful receptacle for the stowage of bulky objects. Passing out toward the front parlor (D) is a series of shelves having an artificial stone bottom and back, intended by its proximity to the living-room to serve as a cupboard for provisions, &c. D is a spacious handsome parlor, having two windows: the fireplace is placed a little out of the centre of the room, so as to leave a convenient space in which to put an additional bed in cases where this would be required to be used as a bed-room. On the other side of the fireplace is a sideboard and cupboard.

"The centre sections, comprising the smaller lettings, consist of two rooms and a wash-house, &c. The wash-house A and the living-room B are exactly similar to those in the larger letting. The bedroom C can be conveniently converted into a parlor by arranging a set of curtains across the recess at the back of the room, and thus dividing the part where the bed would be placed from the rest of the apartment. W W W represent the

Ground Plan of a Flat, Nos. 1 and 2 having Four Rooms, and Nos. 2 and 3 Three Rooms for each Family.



Fresh air and sunlight in every apartment, a convenient and proper distribution of domestic apartments, a convenient arrangement of the domiciles with reference to local drainage and the avoidance of all nuisances, and a plan of arrangement of the respective domiciles, and of access thereto, that in a great measure overcomes the tendency to gregarious herding that prevails in ordinary tenant-houses.

Let plans like this be so modified and Americanized as to suit American tastes and preferences, and the value of such domiciles would become sufficiently popular to make them pay even a higher rental than Alderman Waterlow now receives, and which was, for the first year, about *nine per cent.* upon total investment and leasehold. Pure air, sunlight, domestic convenience, comfort, and home quietude, can be provided for the industrial and poor classes; and although such a plan as the one represented in the preceding diagram is particularly designed for families that are a grade above the humblest day laborer, it were well that some attention should first be given to those classes that most deserve, and most certainly and speedily repay the efforts that are put forth for their welfare. And it need not be doubted that our own architects and civil en-

---

windows. The plan is the same on each side of the party walls, and every floor or flat is a repetition of the other. Close to the ceilings of all the rooms a ventilator is placed which communicates with air shafts running through the centres of the chimney-stacks. The air is thus constantly rarefied, and a system of natural ventilation is produced. Besides this, it will be seen that by setting open the windows a current of external air can be at once passed through every room in the direction of the dotted lines. The lower panes of the windows are filled in with ornamental ground glass, so that no window-blinds are necessary. The windows are constructed on a somewhat novel principle, being made to open outward like ordinary French casements; but the two lower panes are not made to open, so that the danger of children falling out, as well as the disadvantages of the ordinary window sashes, are avoided. All the rooms are 8 ft. 9 in. in height. The other dimensions are figured on the plan, and need not be repeated here. Drainage is effected by means of 4-in. stoneware pipes passing from the top of the building down the corners of the wash-houses directly to the common sewer. The dust-shaft carries the dust to covered receptacles at the base of the building, and each shoot is provided with an iron cover so as to prevent the return of dust and effluvia. The dust-shafts are also continued to the top of the building, and act as ventilators to the dust-bins. All the rooms are plastered and papered, and the wash-houses are plastered and colored. Every tenant has his apartments completely to himself, and nothing is used in common except the roof as a drying and recreation ground. By extending the area of the building three or four feet in every direction the size of the rooms could be easily increased, and suites of rooms obtained well adapted to the requirements of any class of the community." A flower-garden and grass-plat occupy the rear yard, neatly kept by the superintendent of the house.

gineers will succeed in producing plans that shall be found entirely adequate to meet any existing demand for improved dwellings for the poor, and that they will improve and simplify any good European models that may be proposed.

The time for action has come. The evils that characterize the present tenant-house system demand remedies which can be applied only by the wealth and intelligence of citizens, and by the interposition of well-administered sanitary regulations.* The statistics, the thousands of pages of sanitary records by the Medical Inspectors, the death and burial records of the City Inspector's Office, and the not less significant records of the criminal calendar, the penitentiary, the almshouse, the fever-hospital, and the orphan-asylums, might all be quoted and placed in the argument in favor of an enlightened, prompt, and effective effort to improve the dwellings of the poor; but the facts relating to the sanitary bearings of this subject having now been fairly presented, the Council would give a practical direction to deep convictions that are entertained by its members, by recommending:

FIRST.—*That capitalists, architects, and builders should unite in devising and executing the construction of improving dwellings for the industrial classes in the city.*

---

* The philanthropic and thoughtful Rector of St. Luke's Hospital, whose life and teachings present an instructive example of successful effort for improving the welfare of the poor and suffering classes in New York, in a recent appeal on behalf of the moral interests of those classes, says: "Look at those quarters of your city where the people herd by fifties and by hundreds in a house, street after street. Look at them huddled together in narrow rooms, with surroundings and effluvia where a half-hour's stay would sicken you. See places which might rather be stalls or sties than human abodes. Look at the swarms of children in the streets, on the stoops, at the windows, half-naked or in unwashed rags. See the crowds of rough, half-grown boys in knots at the corners, quick at all sorts of wickedness, loud in foulness and blasphemy, the ready and the worst element of your riots. Mark the looks and the talk of the populace of the dram-shops, and then the exhibitions of godlessness, drunkenness, and licentiousness on the Lord's day, turning it, I had almost said, into Satan's day. And why do I ask you to look at such a revolting state of things among those thousands of your neighbors? In the hope that aught which you or I can do will better it? To propose any scheme for its material improvement? Alas, no. The evil is too gigantic for any grasp of reform at all conceivable. It calls for legislative interference; and that, could any practicable mode of melioration be shown, would call for more public virtue than exists. This massing of human beings, prolific of those vices and miseries, is profitable to too many pockets. The exorbitant rents of the smallest dens or of the larger tenements swell the gains of landlords, who have the plea for any amount of rapacity that they only meet a demand."—"*St. John-Land: A Retro-Prospectus.*" By Rev. Wm. A. Muhlenberg, D. D.

SECOND.—*That effective measures be immediately undertaken to procure the introduction of needed improvements in the ventilation, lighting, and cleanliness of the tenant-houses of the city.*

THIRD.—*That citizens should put forth the requisite efforts to procure the enactment and execution of suitable sanitary laws for the better regulation of tenant-houses, and to enforce the necessary care and cleanliness of the same by the owners, lessees, and occupants.*

FOURTH.—*That a Department of Social Statistics and Dwelling Improvement be maintained in connection with the plan of labors pursued by the Council of Hygiene and the Board of Engineers and Architects of the Citizens' Association of New York, for the purpose of acquiring and imparting needed information relating to the social statistics and improvements in dwellings which sanitary science and the public welfare require, and which will best conduce to the immediate development and execution of successful plans and examples of the dwelling improvements which are demanded for the physical and the social welfare of the industrial classes.*

SANITARY WANTS OF PRIVATE DWELLINGS, HOTELS, PUBLIC HALLS, AND PUBLIC CONVEYANCES.

An abundant supply of fresh air, at a proper temperature, is the first requisite of health in every place. Whatever else may be neglected in the arrangements for personal comfort, the laws of health render it unjustifiable to allow any failure to supply an abundance of pure fresh air to every apartment or place that is occupied by human beings, whether temporarily or permanently. Great improvement has been made in the ventilation of certain private residences in this city during the past few years, but there yet prevails a general neglect of the means of ventilation in the hotels, church edifices, schoolrooms, public halls, and railway carriages, steamships, and passenger boats, in which millions of persons are every year exposed to the prevalent evils of a vitiated atmosphere. In this Report the Council would mention this subject solely for the purpose of inviting renewed attention to its practical importance, and to the duty of providing sanitary regulations relating to air-supply in all public buildings and public conveyances in which large numbers of people are frequently gathered.

Observation and experience have abundantly verified the conclusion that for healthy respiration, a person requires a constant supply of fresh air at the rate of ten cubic feet per minute, or six hundred cubic feet every hour; and it has been decided by the best authority that where large numbers of persons are assembled in the same apartment or building, the rate of air-supply should not be less than about one thousand cubic feet per hour, and that the space allotted to each individual should not be much less than a thousand cubic feet, in ordinary apartments: yet the all-essential point that should be kept in mind in all estimations and plans of ventilation is *the amount, certainty, and constancy of the supply of fresh air.* However unnecessarily and seriously individuals may deprive themselves of the blessings of a pure and health giving atmosphere in their private dwellings, the necessities of public health and safety, no less than the simple principles of humanity and justice, require that in all public buildings, halls, hotels, school-rooms, etc., and in all public conveyances that are liable to be crowded with a large number of persons, there should be a strict enforcement of sanitary regulations for ventilation. The fact must be borne in mind that the worshippers in chapels, the audiences in concert rooms, theatres, and assemblies; the thousands of children that throng our school-rooms; and the millions of persons who crowd the railway carriages, ferry-boats, and passenger vessels, are utterly dependent upon the public authorities, and the persons who prepare the structures for public use, for the vital air which the laws of life require to be freshly supplied every moment. Especially is it necessary that public authority should be exercised over the ventilation of such places where the allotment of aërial or cubical space to each individual is very limited, as in railway cars, assembly rooms, and school buildings; and nowhere is the necessity for such a sanitary regulation of air-supply or ventilation more urgent than in the tenant-houses of this city. Considerations of humanity, as well as the necessities of the public health and safety, require that this subject should receive the immediate and most practical attention of competent authorities.

The local or house drainage of the various classes of dwellings in the city demands better regulation; for, in consequence of imperfections in soil-pipes, stench-traps, sewer connections, etc., par-

ticularly as regards populous and crowded habitations, such as tenant-houses, boarding-houses, and hotels, a vast number of cases of obstinate diarrhœal complaints and typhoid fever are induced. Frequent allusions to this subject have been made by the Sanitary Inspectors.

NEGLECTED PRIVIES AND DARK PLACES.

The unspeakable filthiness and neglect of the privies pertaining to the tenant-houses demand attention. These necessaries of every domicile are so neglected and filthy in all the crowded districts of the city as to have become prolific sources of obstinate and fatal maladies of a diarrhœal and febrile character, and they must be reckoned among the most active of localizing causes of prevailing diseases among the poor. The miserable economy that has attached to every tenant-house, court, or cellar a series of *midden* sinks, frequently without any sewer connection, and seldom with sufficient drainage of any kind, should be superseded by suitable water-closet arrangements for constant "flushing" and cleanliness. Reform in these matters is vitally important to the health of tenant-houses.

The exclusion of sunlight from the domiciles of the poor is another violation of the laws of health, and it is a wrong against the dependent human beings who inhabit such houses. The narrow and well-like courts, and the back-to-back rear tenant-houses, that are so numerous in the *pauvres faubourgs* of our city, are pernicious at once to the health and morals of such localities; they inevitably become haunts of social debasement and vice, as well as of fevers and every bodily disease.

The immediate and permanently advantageous results of the sanitary improvement of dwelling-houses, particularly of those occupied by the poor, can scarcely be overstated. Says Miss Nightingale, "It is a fact demonstrated by statistics that in the improved dwellings, the mortality has fallen, in certain cases, from 25 to 14 per 1,000; and that in the common 'lodging-houses,' which have been hot-beds of epidemics, such diseases have almost disappeared through the adoption of sanitary measures." The results of the great experiment of improved and well-ventilated dwellings for the industrial classes in London are abundantly decisive of the fact that by means of such an improvement alone, the sickness-

rates and the mortality in the families thus benefited are readily reduced in the striking ratio mentioned by Miss Nightingale.

For example, the Society for Improving the Condition of the Laboring Classes in London, recently reported that the total population of the model lodging or tenant-houses, which it had constructed, was 2,186, and that the total number of deaths in the same the last year was 45, or but 20½ in the 1,000. This would give but 1 death in 49 of the inhabitants; and yet upon the same ground, in former years, when the same families occupied the old tenements—unventilated and surrounded by domestic filth—the rate of mortality was more than twice as great. But it is not necessary to dwell upon the details of this subject. The intelligent citizens of New York can, with the blessing of Providence, work out results as great as those which in a single year reduced the mortality *fifty per cent.* in a particular district of St. Giles, by means of cleansing and ventilation. At the same time there is reason to believe that architects, builders, and the proprietors of the more important of the public buildings, hotels, railway and water conveyances would not be indifferent to practical suggestions for the sanitary improvements that are required at their hands for the public welfare.

SPECIAL NUISANCES.

Civilization and refinement, in a city like New York, encounters the same elements of debasement that stand in the way of effectual sanitary reforms; but all the laws of health and all sanitary works are justly counted among the most valued agencies of social elevation and refinement, and were there not abundant force in the sanitary reasons for the abatement of needless nuisances, and for the special management of all the necessarily offensive materials and operations which are incident to civic life, we might leave to the pleadings of an offended and refined community, and to the aggrieved senses of a million of people, the argument and the effort to procure the abatement of the gross nuisances that abound in various districts of the city. It is safe to say that wisely administered sanitary regulations would altogether remove and prohibit nearly every source of public nuisance in this city. It is not our purpose to present unnecessary details upon this subject, but sim-

ply to state what nuisances are to be regarded as injurious to public health and to individual welfare in our city. They may be enumerated as follows: (1) filthy streets; (2) neglected garbage and domestic refuse; (3) obstructed and faulty sewers and drains; (4) neglected privies and stables; (5) cattle pens and large stables in the more populous districts; (6) neglected and filthy markets; (7) slaughter-houses and hide and fat depots in close proximity to populous streets; (8) droves of cattle and swine in crowded streets; (9) swill-milk stables and their products; (10) bone-boiling, fat-melting, and their accompaniments within the city limits; (11) the sulphuretted, ammoniacal, and carburetted gases and offensive exhalations that are needlessly liberated and widely diffused in gas manufacture and purification; (12) the accumulations of dumping-grounds and manure-yards in vicinity of populous streets; (13) the present management of refuse and junk materials in the city; (14) the unreasonable overcrowding of the city railway cars, and the absence of all sanitary authority, permitting the unguarded transit and public exposure of persons with small-pox and other loathsome maladies in the public conveyances and otherwise in the streets; (15) the neglect of dead animals in the streets and gutters of the city.

No section of the city has any security against the encroachment or actual presence of these nuisances. A chart of nuisances as they actually existed, and were described by the Sanitary Inspectors, in the autumn of 1864, is presented here, for the purpose of illustrating the fact that even the *most favored* and wealthy districts of the city are seriously encroached upon by the most removable offensive nuisances. It should be sufficient cause to insure the proper effort to effect the removal and prevention of such nuisances that the Sanitary Inspectors report that all the nuisances we have here mentioned are positive sources of disease, and that they have been and are efficient causes in localizing the prevalence of fatal diseases. The particular character, extent, and insalubrious influence of the nuisances here mapped out, will be found more fully described in the SECOND PART of this volume.

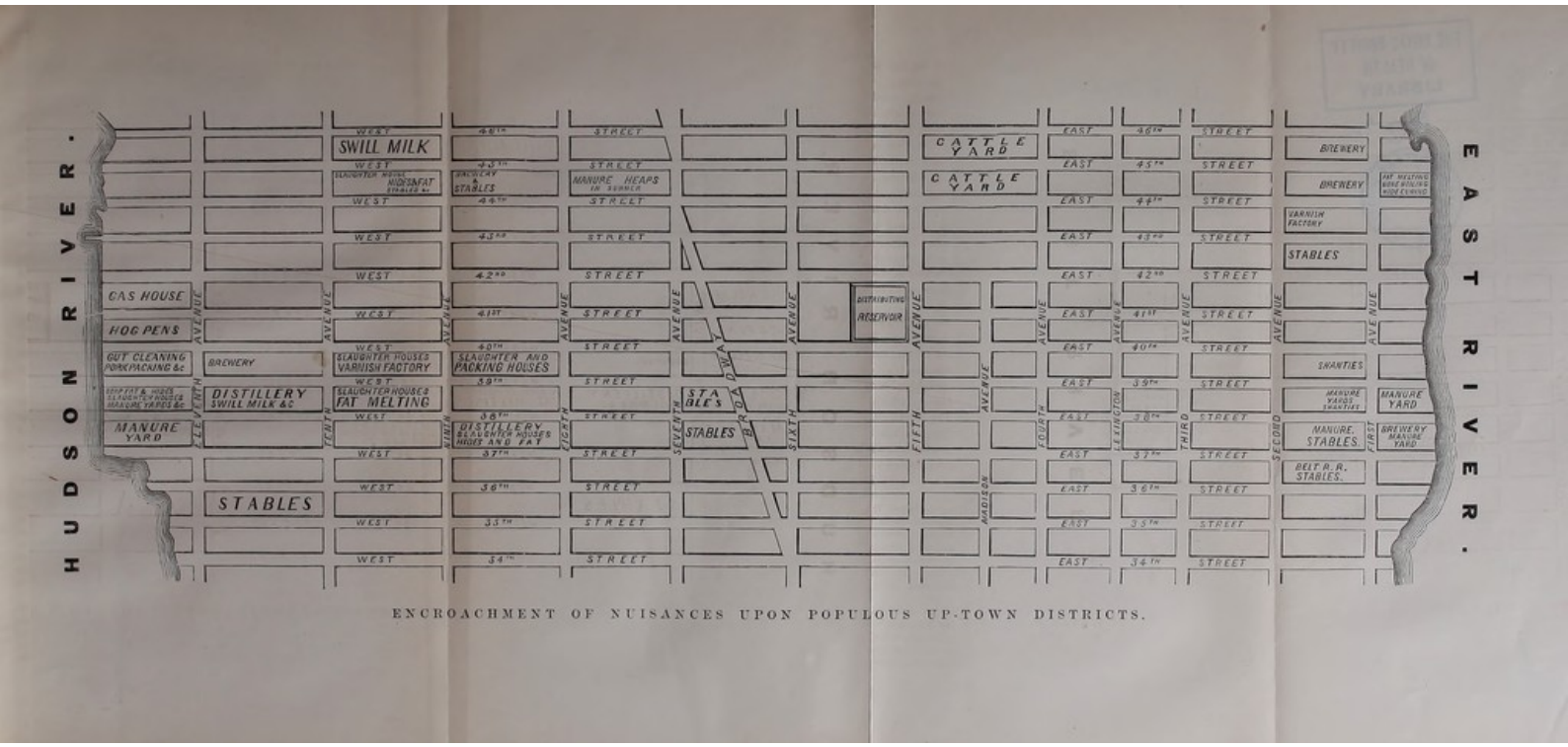
The relation of some of these nuisances to the origin and localization of diarrhœal and typhoid diseases in their neighborhood appears to have been well established by careful observation and medical inquiry; and there is indubitable evidence that certain

unseen sources of the most fatal kinds of disease lurk in the unflushed and uncleaned sewers and house drains, when obstructed or neglected, and that there is great danger that the filthy condition, faulty construction and bad management of privy vaults in the crowded districts will not only continue to be among the most distinct and offensive sources of obstinate disease, but that ere long they will become associated with the active and localizing causes of fatal epidemics. Putrescible organic matter, whether of animal or vegetable origin, when left to decay in the midst of a populous neighborhood, will very certainly induce diseases of some sort. It is particularly on this account that the medical and hygienic adviser is compelled to enter a protest against all needless herding and stabling of animals in the midst of densely populated streets; and with yet greater force is this objection urged against all the slaughter-pens and their adjunct nuisances, wherever located in the thickly inhabited portion of the city.

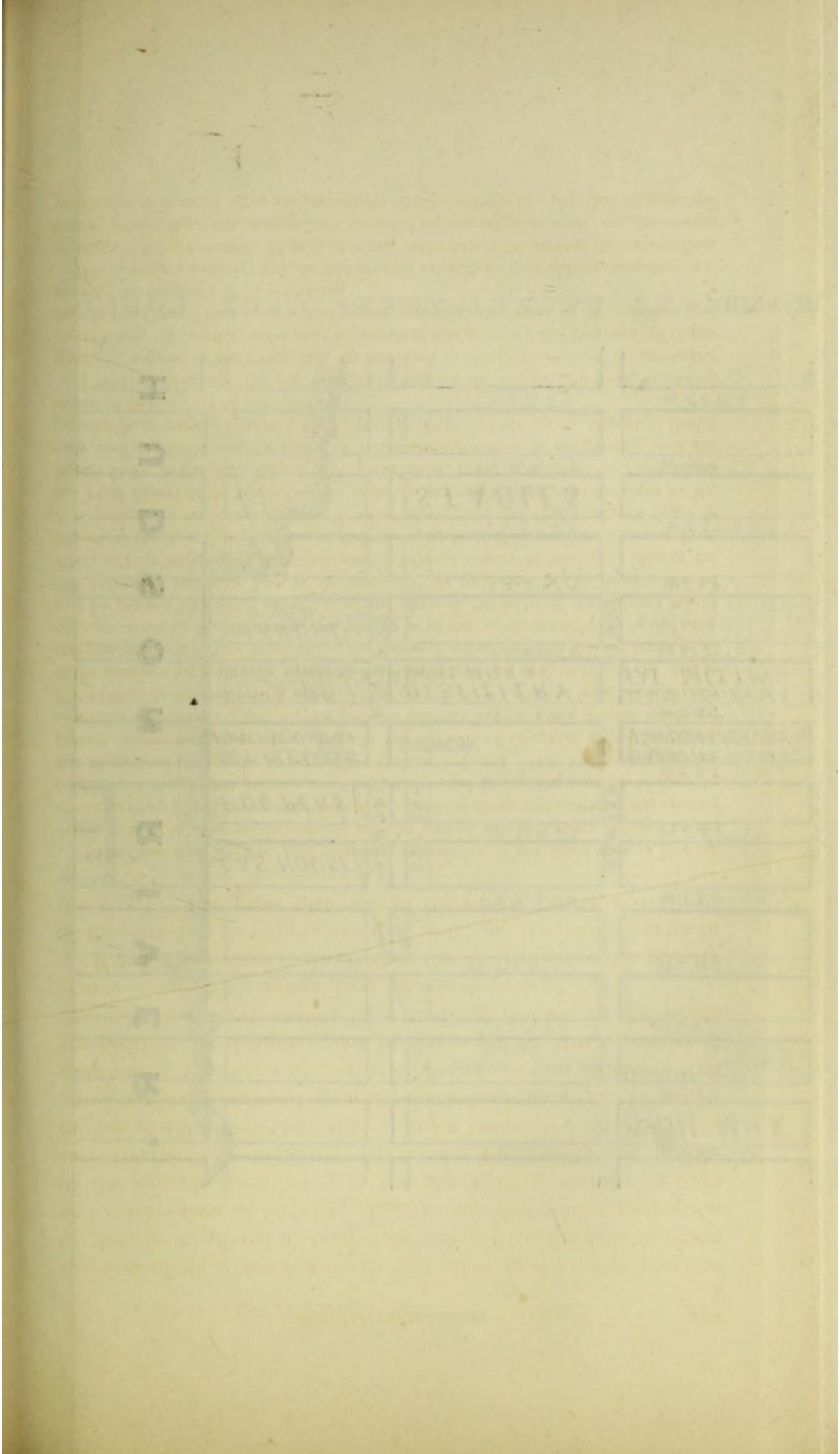
The 173 slaughter houses in this city are too offensive to health and decency to be longer permitted in their present localities. These establishments are now thrust into the midst of the most crowded districts, and it is to be observed that a loathsome train of dependent nuisances is found grouped in the same neighborhoods. We need not comment upon the offensive and debasing influence of the scenes and processes of the slaughter-pen. The intelligence and refined tastes of the people should enforce the demands of hygiene, and at once devise a practical scheme of *abattoirs* that shall be adapted to the wants of this populous and growing metropolis.* That there is a growing necessity for a faithful in-

* The great *abattoir* system of Paris is in effect one of its *sanitary institutions*. There we see the business of slaughtering animals not only rendered inoffensive to health and decency, but the process itself so managed as to insure the proper inspection and care of the animals at the time of slaughter, with reference to the protection of the public health. At the time of Sir Francis Head's visit to the Parisian *abattoirs*, he states there were 66 *boucheries* in the *abattoir de Montmartre* alone, and that the number of fat-melting houses within its walls was 48; the number of beef cattle slaughtered every week, 1,300; the number of calves, 650; the number of sheep, 3,500.

The importance of providing by law for the proper sanitary care and supervision of butcheries and shambles is understood by intelligent market-men, and it needs to be understood by the municipal and health authorities. Self-protection will ere long compel the people to ask the intervention of the State to regulate the butcheries and the market system of this city, if municipal authority and private enterprise do not soon remedy the existing evils.



ENCROACHMENT OF NUISANCES UPON POPULOUS UP-TOWN DISTRICTS.



spection of slaughtered animals and other food articles previous to their being offered in market, is testified by the best butchers and market-men in our city. It is known that a large proportion of the animals slaughtered in the city have to endure for days such treatment as seriously deteriorates the quality and healthfulness of their flesh; and that animals variously diseased and injured are daily crowded upon the markets of the city. These circumstances, together with the offensiveness of the nuisances that are incident to slaughter-pens in the populous streets, render it desirable that there should be a thorough reform of the whole system of supplying animal food for our shambles.*

It is not necessary to dwell upon the description or the remedy of the various other nuisances that endanger the public health in this city.† The gross filthiness of the streets, courts, and alleys,

---

* The Council of Hygiene, as a voluntary organization, is not called upon to give the details relating to the gross impositions and the sources of evil that are inflicted by the existing system of butcheries and markets, or rather the absence of control of the sanitary condition of slaughtered animals and food articles; nor is this the occasion to describe and recommend the specific improvements that are required. It is known that very important improvements have been made in the methods of slaughter, as well as in the treatment of butcheries, and all that pertains thereto; and it is well known, moreover, that animals variously diseased, and meats variously injured for use as food, are sold daily to the unsuspecting multitudes who purchase in the established markets of the city, and to still greater numbers who depend upon the thousand minor shambles that are found in all populous districts. Useful information relating to all the questions alluded to in this note, may be gleaned by careful inspection of the physical condition of the animals in the slaughter-pens, and their flesh in the shambles; or by perusal of Col. Devoe's *Market Book*, and by conversation with that most intelligent master of his trade; also in the Reports of the New York Academy of Medicine upon *Swill Milk*, etc.; the letters of Prof. J. S. Gamgee to Sir George Grey, on *Diseased Meats*, etc.; also Prof. Gamgee's paper in the *Fifth Report of the Medical Officer to the Privy Council*, 1863; and the paper by Mr. Robert Ceely, in the *Sixth Report* of the same officer, 1864, on the *Anthrax Fever* in animals used for food; and for notice of various improvements in slaughtering, and the preparation of meats for market, the *Lectures on Public Health*, by Dr. Mapother, Health Officer of Dublin, may be consulted.

† What is known as the *gas nuisance* throughout the city of New York, is caused mainly by a defect in the means that are employed in the purification of the gas at the gas factories. Upon the causes and the remedy of this gross evil, the Professors of Chemistry in this Council have made a final report, explaining the causes of the nuisance, and showing the feasibility of its prevention.

The sewer-gas nuisance, and the abominable exhalations from various manufactories, all admit of being remedied. There is abundant evidence that the gaseous emanations from sewers, privies, decaying garbage, and neglected stables, stagnant water, etc., are always productive of diseases which are particularly fatal to infantile life, and that all great epi-

the putrefying masses of animal and vegetable matter, together with dead animals, obstructed sewerage and drainage, and poisonous exhalations from manufactories of various kinds, combine to pollute the atmosphere of the entire city. Yet all of these sources of insalubrity and increased mortality are of the most preventable character, and it is the unanimous opinion of this Council, that no system of Sanitary Government which fails to comprehend and control such evils can be adequate to the demands of an advancing civilization, or equal to the present wants of this city.

THE DRAINAGE AND SEWERAGE OF THE CITY.

The Citizens' Association has wisely intrusted the investigation of questions in engineering and architecture to competent and experienced minds that have been trained to such inquiries; consequently it has been deemed necessary by the Council of Hygiene to consider only the strictly hygienic bearings of the facts relating to the drainage and sewerage of the city. All these points have been so ably presented in the Reports of the Sanitary Inspectors of the Third, Fourth, Thirteenth, Seventeenth, Twenty-fifth, Twenty-eighth, and Twenty-ninth Districts, that we refer to those Reports in the SECOND PART of this volume, for details relating to the subject. The Inspectors have earned well-merited thanks for the careful study they have given to the questions which the Council prepared on this subject. The pernicious influence of imperfect drainage and neglected or faulty sewerage, and the fatal poisons that are generated by accumulated sewage and putrefying organic materials are no longer merely matters of opinion, but, as will be noticed upon a subsequent page of this Report, they stand related as direct causes of some of the most insidious, obstinate, and fatal diseases that afflict our city.

The chief features of the drainage and sewerage of this city that concern our sanitary inquiries relate, (1) to the original conformation and character of the surface soil of the island on which the city is built; (2) the origin, cause, and outlets of the primitive streams of water; and, (3) the obstruction or obliteration of those streams; (4) the plan and construction of the sewers with regard

---

demics of fevers, cholera, etc., are localized and rendered peculiarly fatal in places where such nuisances abound.

to free and clear outlet, without nuisance; and (5) the arrangements for flushing and for preventing the reflux or escape of sewer-gases in the streets, and into dwellings and other buildings; (6) the skilful connection of house-drains with the main sewers; (7) the thoroughness of drainage and sewerage with reference to the sanitary influence of a dry atmosphere. All these points have been carefully considered, and valuable observations have been made during the progress of the sanitary survey and inspections. In three of the badly drained districts, noted for their insalubrity, a series of hygrometrical observations was kept up during the warm season. With regard to practical results from those observations, we need only state in this place that any marked degree of excess of humidity in any locality, as compared with the standard observations at Essex Market, was, without exception, found to be associated with an excessive constant sickness-rate, and particularly with infantile diseases, and all kinds of contagion and infection.

While it is recognized that the drainage and sewerage of the city must be treated by skilled engineers, it is the opinion of the Council of Hygiene that it is desirable that all questions that are connected therewith should be treated as questions of 'sanitary engineering.' The Health Towns Commission, the Metropolitan Sanitary Commission, the Poor Law Commission's Sanitary Inquiries, in Great Britain, and the National Sanitary Convention at its session in Boston, have presented the subject of the drainage and sewerage of cities, as requiring sanitary treatment. That the economical and commercial questions, as connected with this subject, should be subordinate to hygienic requirements, is confessed by the ablest and most recent writers upon the economic questions of sewerage.*

---

* Says Mr. Menzies, in his admirable Treatise on Drainage and Sewerage: "The preservation of health and the saving of human life must be the first consideration; the cost of drainage, or of utilizing the sewage, the second;" and he goes on to show that "the least outlay will be incurred, and the greatest return obtained from the most sanitary system." *See Treatise on the Sanitary Management and Utilization of Sewage, comprehending details, etc., etc.* By Wm. Menzies, Deputy Surveyor of Windsor Forest, London, 1865.

The whole subject of the sanitary and economical management of the drainage and sewerage of cities, and the utilization of sewage, is receiving much practical attention in England. Baron Liebig has entered upon a comprehensive investigation of the economical treatment of the subject in London, while the extensive experiments of Alderman Mechi and Mr. Menzies have shown how successfully the most practical economist can aid in

That the sewerage and the natural drainage of the city may be rendered very complete appears not to admit of a doubt, and there is abundant reason to believe that there needs to be an intelligent sanitary inspection, by sanitary engineers, throughout the the entire system of the city sewers, and that the original watercourses should again be permitted to have their deep and free outlets to tide water, in order to diminish the amount of humidity and decomposition that results from the artificial obstruction and diffusion of those streams. The main question, however, that must receive immediate sanitary consideration, relates to the flushing and cleansing of sewers, and the effectual control of sewer-gases.

SPECIAL APPLICATIONS OF CHEMISTRY AND OTHER SCIENCES TO SANITARY WORKS.

In various ways, and at every stage of progress in sanitary improvements that are required in our city, must the most skilful applications of medical diagnosis, chemistry, and sanitary engineering be invoked. The Council of Hygiene has given a practical expression to this view by recommending the maintenance of a department of Dwelling Improvement, in which the skilled engineer and the architect shall aid in working out the most important sanitary and social problems; and by the union of two of the leading Professors of Chemistry in the works of the Council, the methods of such coöperation of the sciences have been practically illustrated. At an early stage of the sanitary inspection, it became necessary to seek special advice from the Chemical branch of the Council,* and at a later period, a specific report was sought and received from that branch, respecting the proper scope and applications of chemical inquiry in promoting the public health of the city. By vote of the Council, the report is here introduced as a statement of views which should be presented to intelligent citizens.

---

promoting sanitary works. For recent and very valuable contributions to the hygienic treatment of this subject, we would refer to a *Report on Civic Cleanliness*, made to the National Sanitary Convention at Boston, 1860, by E. L. Vielé, Esq.; the Essays of Rev. H. Moule, on *National Health and Wealth;* Prof. E. A. Parkes' *Manual of Practical Hygiene*, London 1864—article, "*Sewerage and Methods of Removing Sewage Matters;*" also Dr. C. A. Murchison's Treatise on the Continued Fevers of Great Britain, London, 1862—article, "*Prophylactic Treatment.*"

* See pages 312, 313, PART SECOND.

REPORT UPON THE HYGIENIC APPLICATIONS OF CHEMISTRY: BY PROF. JOHN W. DRAPER AND PROF. R. OGDEN DOREMUS.

The Committee to whom was referred the inquiry, "What useful and practicable investigations and analyses may be made respecting the chemical nature and changes of the soil and atmosphere of the city, with reference to the public health, and the nuisance of insalubrious emanations from gas factories and the sewers of the city," beg leave to present the following report:

The experience of large cities has shown that systematic hygienic investigations must be directed to the following points:

I. The water, which is in general, and that which is in certain cases in special use.

II. The composition of the air as regards the entire locality under investigation, and also in particular localities where the population is dense, the houses badly constructed, or where emanations from gas factories, &c., contaminate it.

III. The quality of the food articles exposed for sale in the public markets or stores, as respects their accidental deteriorations or purposed adulteration.

IV. The character of the soil on which the city is built, its retention of water, its chemical composition, the dust that may arise from it, or the gases that it may permit to escape into the air.

The present state of chemistry is such that all these points may be dealt with in an intelligent manner and with great precision. Solutions to the different questions that may be propounded can be given, of so reliable a character as to form a satisfactory basis for the hygienic action of physicians and of the public authorities.

Indeed, it is only in this way that information of sufficient certainty for such purposes can now be acquired. Hygiene must rest on the basis of chemical investigation.

The undersigned now propose to offer a few remarks on each of the four topics just designated. These remarks are necessarily of a general kind, and will be directed mainly to the special case of the city of New York.

I. First, then, as respects its WATER. This is presented to us in two states: the general city supply of Croton-water, and the special supplies derived from wells or springs.

The impurities of the Croton vary with the seasons of the year, and sometimes rise to such an extent as would excite public astonishment if the circumstances were generally known. Nothing need here be said respecting the effect of these impurities upon the public health, but there is reason to believe that our city physicians are very far from realizing the importance of this state of things.

The undersigned, therefore, recommend that an analysis of the Croton-water should be made, samples being taken once each week, and the investigation continued for one year. Collating the important evidence that would thus be acquired, the Croton Board might be instructed as to the measures it is needful to take to diminish the access of these impurities, or perhaps to exclude them altogether.

In the next place, as respects wells or springs. Since the introduction of the Croton and the development of the sewer system, these have undergone very serious changes. The water they yielded was bad enough in former times; it is if any thing worse now. As illustrations, it may be mentioned that twenty-five years ago the water which was furnished by the pumps in the vicinity of Washington Square, though very clear and pellucid to the eye, was overcharged, as was discovered in the Laboratory of the University of New York, with phosphate of lime (bone earth), and an extremely fetid animal matter. These impurities were derived from the human remains that were buried around in what was once the Potter's Field.

As a more recent instance, it has within a few days been observed, in the same laboratory, that water taken from a well in the Twenty-second Ward, by one of the officers of this Association, contained not less than forty-eight grains of solid matter in the gallon, half of this being putrid organic substance. It is complained of, that the neighbors using it are greatly troubled with diarrhœal diseases. It would be surprising indeed if they were not.* This sample of water contains ten or twelve times as much solid material as the Croton-water under average circumstances; and so far surpasses the waters used in the large towns of America and Europe in its noxious ingredients, that if it is any thing like a fair sample of the well-water of those districts of the city, there can be no doubt that its use should be prohibited by the public authorities,

* See report of Chemical Analysis of this water, and an account of the diseases arising therefrom, SECOND PART, pp. 312, 313.

and means taken for the supply of a sufficiency of Croton in its stead.

It is therefore recommended, that a general analysis of such water should be made; one such analysis in each instance will probably be sufficient.

The water that has been used for cleansing purposes should, by appropriate means, either be conserved and disposed of for agricultural uses, or delivered into the *currents* of the East and North Rivers.

During its passage through the sewers, noxious gases should not be allowed to escape into the streets, through the ventilators, when they can be so readily absorbed by charcoal and other absorbents; the sewers, moreover, should be so constructed as to convey their contents where they are sure of being removed by the streams which ebb and flow so conveniently on each side of our city, and not as at present; for the putrescent matter is now deposited in the docks, where pools of decomposing animal and vegetable offal are formed, from which ill-odored and poisonous gases incessantly bubble up. Nor should the outlets of the sewers be so exposed that winds can blow back the noxious emanations.

In conclusion of this portion of the subject it may be remarked, that there has recently been made a very important improvement in the operations for the chemical analysis of the solid residues of water, by Spectrum Analysis as it is termed.

II. Second, as respects the air. In a general manner the atmosphere of a large town is supposed to have a very uniform composition. This opinion, which is commonly entertained by non-medical writers, has been sustained by negative evidence derived from the heretofore imperfect state of gas analysis. But as we have just mentioned in the instance of water, so again in the case of air, great improvements have recently been made, and questions can now be determined which it was impossible to solve some years ago. These improvements indicate that the air of large towns is very different in different localities, not only in houses variously constructed, but in the open street. They enable us to detect and to offer legal evidence of sources of contamination by clearly identifying them. They also, it is to be especially remarked, furnish suggestions respecting the construction and proper ventilation of dwellings.

Your Committee, therefore, suggest that systematic examination of air-samples obtained from localities specially determined upon, should be made; not concealing, however, that these would undoubtedly prove to be the most difficult and expensive of the inquiries thus recommended. But the advantages to be derived may doubtless be considered as more than an equivalent, especially if they should suggest, as they very probably would, means for the recognition of the morbific agents generated in "fever-nests" and improved measures for their destruction.

III. Third, as respects FOOD articles exposed for sale in the public markets or stores.

These, as is well known, in many cases may undergo spontaneous deterioration, becoming not only unsuited for their purpose, but absolutely poisonous. Cases of this kind are within the knowledge of every physician of experience in the city.

Again, such food articles are not unfrequently nefariously adulterated by tradesmen. A great deal of attention has of late years been given to both branches of this subject in foreign countries, and a large amount of information acquired both as respects the means to be resorted to for the detection of such deteriorations and also their prevention. The subject, however, necessarily branches into so many details as to be unsuited for more particular consideration here. It is, therefore, perhaps, sufficient to say, that the questions arising in connection with it are all readily dealt with by modern methods of analysis and examination, and that the extent to which such investigations ought to go will be best determined as the occasion arises.

IV. Fourth, as respects the SOIL. There are many important hygienic questions connected herewith. Among these may be mentioned the influence of dust material, that in variable qualities is always present in the air, and how far the operation for its abatement by watering the streets in the dry season of the year is justifiable. Not without reason is there a growing prejudice against this operation, from a suspicion that it is attended by consequences disadvantageous to the public health. The settlement of this question is not beyond the range of chemistry. It is mainly connected with such examinations of the constitution of the air as we have previously alluded to.

The same remark of course applies to the examination and determination of the aërial and vaporous matters that are perpetually escaping, even in the best-paved parts of the city, from the soil. The production of these substances and their nature are largely dependent upon the mechanical condition as well as the chemical composition of the soil in which they are generated. Its mechanical condition, if clayey or plastic, may give rise to their retention; if sandy or porous, may give facilities for their extrication. Its chemical composition of course determines what they are. The surface-soil or street-dirt necessarily varies very greatly in the different parts of the town, being determined in one place by the non-occurrence of sewers; in another by the domestic habits of the inhabitants as to cleanliness or the reverse; in a third by the continual passage of cattle and the dropping of their excrements; in still another by the prevailing occurrence of certain manufactures, as of gas, leather, and the like. There can be no doubt that these very various modifications of surface-dirt are intimately connected with the public health, and in the hygienic management of the city are alone to be dealt with by a well-ordered arrangement for cleaning the streets, and by extensions and improvements in the system of sewers, as before referred to.

Your Committee have not thought it necessary to introduce any detailed or special remarks as regards houses or dwellings. It is well known that public attention elsewhere is strongly directed to this point, more especially with a view of contriving better structures for the laboring classes and the poor. It is very desirable that our places of public resort, as churches, theatres, court-rooms, &c., should have such complete ventilation that each individual present in them should receive his healthful portion of pure air, and yet without incommoding any with draughts. It is evident that such improvements will be, to a large extent, indicated by the solutions that may be obtained of the different questions that have been pointed out in this report: How and under what circumstances water should be furnished? what are the best and most available means of ventilation? what are the most economical and effectual methods of warming? On a subsequent occasion, if the Association should see fit, we shall offer some remarks on these points, and therefore shall abstain from treating further of them at present.

PRACTICAL CHARACTER OF SANITARY WORKS.

Sanitary science is exceedingly practical in all it teaches or suggests. It takes cognizance of diseases, mortality, and all dangers to health; and its inquiries as well as its applications descend directly to *causes*. From the investigation of causes it brings forth remedial suggestions, and projects sanitary works.

The preceding sections of this Report, together with the accompanying body of Evidence, relate exclusively to practical questions, and the facts thus collated show at once the necessity and the nature of the sanitary works which the public health of the city requires. The preliminary studies and experience, the patient research into the nature and origin of diseases, and the practical discrimination of their causes, particularly of those that are preventable, and the suggestion of needed remedies or preventives, have justly been demanded of the medical profession. Chemistry offers its marvellous resources, while sanitary engineering, and all the improvements and means of the mechanical arts, are able in various ways to promote the practical works that are needed for the protection of the public health. However varied and important may be the resources of sanitary science, and the arts which it subordinates to its service, the laws of health are so exceedingly simple that their applications and results are neither difficult nor of doubtful utility. Pure air, suitable food, sunlight, and clothing for the body; and such peace and hope as give mental repose to the mind, as well as buoyancy to daily life, constitute the elementary conditions of sanitary welfare. Health is a boon, however, that must be sought and protected, especially in civic life, or it is soon alienated. So definite are the conditions upon which it depends, says one of the ablest teachers of hygiene, that "it is undoubtedly true that we can, even now, literally choose between health or disease; not perhaps always individually, for the chains of our civilization and social customs may gall us, or even our fellow men may deny us health, or the knowledge which leads to health. But as a race, man holds his own destiny, and can choose between good and evil." *

To supply an abundance of fresh air in all classes of habitations; to guard against the causes of deterioration or injury of food arti-

* Prof. E. A. Parkes, *Manual of Hygiene*, p. xvii.

cles; to shut up, by sanitary regulation, all cellars and unsunlighted dwellings, and to restrain the infections of fever and its needless causes of wasted energies and blighting discontent and unhappiness in the poor man's home, are simple and most practical problems, and it is plain that the physical agencies for accomplishing such beneficent works are entirely within the reach of enlightened citizens. These are SANITARY WORKS.

PREVALENT DISEASES WHICH ILLUSTRATE THE NECESSITY OF SANITARY WORKS.

FEVER.—Two thousand and eighty-three persons died of fever in this city during the year 1863. Nine hundred and three of these deaths were caused by scarlet fever, a disease that is fearfully fatal in unventilated and crowded dwellings; eighty-three were from puerperal disease, and all the remainder, excepting two cases, were from typhus, typhoid, and malarial fever poisons, all of which were preventable. The nine hundred and fifty deaths from typhus and typhoid fevers that year represented, probably, more than twelve thousand cases of that most preventable type of disease. During the year 1864, it is known that fevers were still more prevalent. The Sanitary Inspectors during the summer and autumn studied the local history of upward of sixteen hundred cases of typhus, with reference to the localizing causes that existed in particular places. We refer to the Inspectors' Reports for their description of the *fever-nests* of the city, as seen and canvassed by them.

Some details upon this subject were presented in preceding pages, and we will here add the following extracts from reports received from the Inspectors since those pages were written. The Sanitary Inspector of the Sixth District submits the records and statistics of 156 houses and premises which at the time of his last visit to them "were in a condition so filthy and neglected as to be unsafe to the people residing therein, and which during the past few months have been visited by typhus, small-pox, and other pestilential diseases." The following examples of those fever-stricken dwellings illustrate the prevailing characteristics of all: "At No. — Mulberry Street, there are 28 families and 135 persons in the premises, front and rear—a lot 25 feet by less than 100 feet. During the past two months 14 cases of typhus fever have occurred in these families, and that during the past six months 7 persons have died there. Further, that fevers and other preventable diseases

have prevailed there almost continually during the past two years; the alley, passages, privies, cellars, and surroundings of those houses are and have been very filthy; the gutters and street, in front of the houses, obstructed by piles of filth and garbage, and that the causes which render the premises insalubrious, are of an entirely removable and preventable character. No means have been employed by the municipal government to prevent or diminish the prevalence of fever in the houses here described." The following figures show the rate of packing in that tenant-house: *Pro rata* of area upon the entire house-lot to each inhabitant, $16\frac{2}{3}$ square feet; allotment of air-space to each person in the family or living-rooms, 220 cubic feet; allotment to each person in bed-rooms, 161 cubic feet. And further, the rear-house is built back-to-back against another rookery in the rear of Baxter Street, thus completely obstructing external ventilation. Typhus has prevailed in the adjacent tenant-houses throughout the year.

The Sanitary Inspector of the Fourteenth District (eastern half of Seventeenth Ward) submits a record of 49 places where typhus prevails, or has recently occurred in his district, under circumstances similar to the causes that localized the same fever in the places just described in the Sixth District; and from the Fifteenth District the following condensed report of three fever-nests is submitted:

Street and No. of the Houses.	Character and surroundings of the Houses.	No. of Families in the Houses.	No. of Persons in the Houses.	No. of Children that have died during last 6 months.	Total No. of Deaths at all ages during last 6 months.	Total No. of persons now *Sick* and *Diseased*.	The Ratio of total Sickness in total population.	The Ratio total Mortality in population for 6 months.	Remarks.
No. — East 10th	rear, 4 stories.	8	40	3	4	10	1 in 4	1 in 10	Overcrowded, unventilated, privies & court very filthy.
No. — East 11th	rear, 3 stories.	5	16	1	2	6	3 in 24	1 in 8	Here are 4 cases of typhus, & 1 of small pox.
No. — East 4th	front and rear.	18	81	2	7	27	1 in 3	1 in 11½	Here are 8 cases of typhus, and 2 of small-pox.

Facts like the foregoing are reported from all the fever-nests that afflict our city; and in the minutely detailed reports * which the Sanitary Inspectors have made respecting them, there is con-

* For abstract of the form of reports, see pp. xxvii–xxx.

stant and direct testimony confirming the following points: (1) that in many of the tenant-houses of the city there exist such excessive overcrowding, uncleanness, and utter want of ventilation, that typhus is liable to occur at any time; and when once infected with the virus of that fever, such houses will become sources of domestic pestilence and of danger to the public health; (2) that the number of localities which are already infected with the fever-poison (including both typhus and typhoid fever) in this city, is believed to be not less than *five hundred*,* and (3) that the total number of insalubrious quarters which are particularly *liable* to an outbreak or endemic of fever, is not less than about one-fifth the total number of tenant-houses and inhabited cellars, or *not less than three thousand* houses and places; (4) lastly, that the causes which have localized fever in five hundred different places in this city, and which threaten its outbreak in thousands of other localities in the various wards, can be removed and prevented only by thorough ventilation of the houses in which the fever exists or is threatened, by cleansing and purifying, by thinning out the badly overcrowded buildings, and by the perpetual vigilance of an intelligently directed Sanitary Police. Such are the works that Sanitary Science proposes for the immediate remedy and prevention of the typhus plague that has again deeply rooted itself in our city.†

---

* The total number of patients with typhus and typhoid fevers admitted to Bellevue Hospital, and the Fever-Tents on Blackwell's Island, during the year 1864, was 1,209.

The total number of patients with the same fevers admitted to the hospitals of the Commissioners of Emigration during the year, was 1,130.

The total number of deaths from these fevers in the city, including those in the hospitals, during the year 1863, was 951.

† At a recent opening of one of the improved tenant-houses in London (a copy of the plan and description of which we have presented upon pages 86 and 87), the distinguished sanitarian, Edwin Chadwick, Esq., after inspecting its arrangements for ventilation, cleanliness, etc., declared it to be "fever-proof." The following extract from the report of an inspection of the tenant-houses erected and improved by the Society for Improving the Condition of the Laboring Classes, by Lord Shaftsbury and other gentlemen, shows it is possible to render the homes of the poor secure from fever infection. The report states that "in the model-houses in Streatham Street, Bloomsbury, the rooms were found fully occupied," and "the general health of the forty-eight families living in them, excellent." "In the number of years during which this establishment has been open, terrible fevers, that from time to time rage around, have been unknown. The very small number of deaths, of even young children, is remarkable, and shows, in comparison with other places, the extent to which human life might be saved, not only in the metropolis, but also in other large towns.

"The inspections were extended through numerous other buildings of the society,

Diarrhœal Maladies.—This class of diseases, including cholera infantum, cholera, and dysentery, as well as ordinary diarrhœas in this city, and in all large towns, is justly regarded as being almost wholly the result of preventable causes. The total number of deaths from these maladies alone during the year 1863, was 2,665, or 10.57 *per cent.* of the total mortality of the city for that year; and during the ten years ending in 1859, the total number of deaths from these maladies in the city was 34,957. These statistical facts show what an important class of diseases this is.

Now upon perusal of the Inspectors' Reports herewith submitted, some of the active causes of these troublesome maladies of the bowels will be found well described. For example, the Inspector of the Eleventh District found three severe cases of dysentery in a single house on the corner of Gansevoort and West Streets; and in the same neighborhood, in a single sparsely-populated square, between Gansevoort and Horatio Streets, he found twenty-nine cases of dysentery occurring within a period of twenty-one days.* In this instance the cause of the malady then prevailing, as well as of enteric fever that had previously swept over the same locality, was found to be simply the uncovered sewer, and the obstructed and noisome sewage of Gansevoort Street, between West Street and the river. Again, in the Twenty-fifth District, adjacent to the Central Park, we have the preventable causes, and local history of the diarrhœal maladies lucidly explained.† Stagnant water, obstructed drainage, putrefying garbage, decomposing animal matters, putrid exhalations from various sources, deteriorated food articles, and the use of water from wells into which the putrid soakage of filth had percolated, are clearly proven to be the causes of the diarrhœal diseases of that district. Each of the thirty-one

---

both for families and single men, the facts learned being generally of the same satisfactory character."

In a report made at a recent meeting, it was stated that the whole population of this property of the society amounts to 2,186, and in this number, 45 deaths have occurred during the year. This is at the rate of 20½ in each 1,000, and the report states that this "is rather in excess of what might have been expected, but still a great improvement on the result in all London."

* See page 119, Second Part.

† See Second Part, pages 312–322.

The importance of providing by law for the water-supply needed by the inhabitants of poor tenements that are not yet furnished with the Croton, is strikingly set forth in the

Sanitary Inspectors has from week to week brought forward, in carefully-detailed reports, the same essential facts regarding the causes and the localization of the various diarrhœal maladies. The causes which have thus been reported, are of the most preventable nature; and in the opinion of this Council, the duty of speedily removing or controlling such needless sources of peril to an unsuspecting population, is plainly incumbent upon the government, and upon the intelligent classes who can direct the measures required for the public welfare.

Not the poor classes alone suffer the fatal consequences of public neglect of the removable causes of this important class of maladies. The epidemic that swept over the vicinity of the royal court in Windsor, in 1858, painfully demonstrated that a Prince Consort, and the humblest tenant in the same region of putrid sewage, must fall victims to the same local poison that insidiously filled the atmosphere.* The death of many valued citizens, and the fatal

---

report of this district. The water of another of the sparkling wells in a crowded tenant neighborhood, near the Central Park, has just been analyzed for the Council of Hygiene, by Prof. Draper, with the following results:

Organic Matter and Volatile Salts, per gallon,		$10\frac{5}{100}$ grains.
Fixed Salts	Phosphate of Lime, Carbonate of Lime, Sulphate of Lime, Sulphate of Soda, Chloride of Sodium	$14\frac{15}{100}$ "
Total solid residue, per gallon		$24\frac{20}{100}$ "

In all of the numerous families that make use of the water from this well, obstinate and fatal diarrhœal maladies prevail throughout the year. Is it not plainly the duty of the health authorities to know such facts, and shall the city, through the ignorance of officials, neglect to provide Croton-water for the poor?

* For some account of that epidemic, see Dr. Simon's Reports to the Privy Council, 1858–'59–'60; and Dr. Murchison on Enteric Fever, pages 444–446.

In the Report of the Privy Council (England), for 1858, is an interesting paper from Dr. Greenhow, on the "Diarrhœa Districts" of England. Dr. Greenhow was commissioned in the previous year to inquire into their sanitary condition. The towns selected were, Coventry, Manchester, Salford, Nottingham, Birmingham, Dudley, Leeds, Wolverhampton, and Merthyr Tydfil. In all of these, Dr. Greenhow found diarrhœa coincident with one or other of these two circumstances—the habitual drinking of impure water, or the tainting of the atmosphere with the products of organic decomposition, especially of human refuse. In other words, in districts which show a high diarrhœal death-rate, the inhabitants either breathe or drink a large amount of putrefying animal refuse. He traces street by street, showing how diarrhœa, visiting cleanly districts but slightly, is especially grouped around those spots where there is an accumulation of night soil infecting the air in the midst of a dense population, or so placed that the exhalations penetrate into the houses, or can be but slowly dispersed into the general atmosphere. The comparative immunity of other districts resembling these in all respects save this fæcal impurity, is

prevalence of diarrhœal and enteric diseases in many of the wealthiest streets of New York, might justly awaken a demand for the most comprehensive sanitary inquiry respecting the sewerage, and the special nuisances of the city.

Small-Pox.—This is at once the most preventable and the most virulently contagious of all diseases. It is the worst type of a domestic and public pestilence, and for many years past it has been constantly prevalent in various portions of this city. In a previous section of this report we have shown by what agencies this disease is perpetuated and diffused in the city ;* it should now be fully understood that the personal perils and the public evils which result from the official neglect of this disease and its grand preventive, have reached a point that is unequalled in any other city in the civilized world. Yet it is conceded that by means of effectual vaccination, and by proper isolation and disinfection of all existing sources of the malady, small-pox would become extinct. In several Continental countries that loathsome contagion has long been kept almost extinguished by means of vaccination alone, notwithstanding its occasional introduction by immigrants and visitors. For example, in Denmark, Sweden, Hanover, and some other States where vaccination has been efficiently enforced, there has been for many years such immunity from small-pox, that in 1,000 deaths from all diseases, there have been but 2 or 3 from that malady; in Hanover, at one period, but 1 case in 5,728; and in a district of Wales, with a population of 11,000, in which thorough vaccination had been effected by house to house visitation, there occurred but *one* death from small-pox during a period of five years.† Not a death from small-pox occurred in the duchy of Baden during a period of five years, and in Copenhagen there was not a death from it in thirteen consecutive years.

In the United States the first vaccination was performed in the city of New York, in the year 1799, by Dr. Valentine Seaman. The State of Massachusetts soon enacted laws to provide for the superintendence of vaccination in every town, and for the proper

found to be so constant, that it seems impossible not to admit the relationship as one of cause and effect; and medical men affirm that the disease is not only more prevalent, but more unmanageable in the ill-conditioned places.

* See pages liv., lv., lviii., and lix.

† See *Report of the Epidemiological Society*, on *Small-pox and Vaccination.* Published by Parliament, 1853.

isolation and care of small-pox. The results of that excellent sanitary law are instructive. In Boston there occurred but 37 deaths from small-pox during a period of thirty years ending 1837. That law was repealed 1836, and during the twelve and a half years ending July 1850, there were 679 deaths from small-pox in the same city.* In the cities of Baltimore and Providence an effective system of house to house inquiry and vaccination, and a general sanitary supervision by medical authorities, for many years purchased almost complete exemption, of the resident population, from small-pox. In the latter city there were but 19 deaths from this malady in a period of five years, though more than that number of persons sick with the disease arrived from other cities, and tarried there in that period; and during more than half that time, viz., for two years and eight months, there was not a death from it.† In the city of New York, during the sixty years ending January 1, 1864, there were 12,040 deaths from small-pox; and during the last sixteen years of that period, 6,107 persons died of this malady; while during the first sixteen years of the whole period, with an average population greater than one-seventh the average of the last sixteen years, there were but 689 deaths from the same cause.

From these facts it plainly appears, on the one hand, that any city or community may easily secure an exemption from small-pox, and, on the other hand, that in our own city this loathsome contagion has increased its ravages. For a long time past the weekly mortality from this disease has ranged from 25 to 40 deaths. By referring to the Reports of the Sanitary Inspectors, it is found that a criminal negligence of this dreadful contagion exists throughout the city.‡ Facts like the following are continually brought to light by the Inspectors: (*a*) No. — West 27th Street; 3 cases; the clothing of the first patient was carelessly left in the common hall of the tenant-house; (*b*) No. — 33d Street; child with confluent eruption; in room adjacent to the candy and cigar store, kept by mother; (*c*) No. — 6th Avenue; fancy store on the first floor, and dentist's rooms on floor above; patient not removed; (*d*) Nos. —

* See Report of the Sanitary Commission of Massachusetts, 1850; also a Paper by Dr. Robert Ware.

† See *Vital Statistics of Providence*, Dr. Snow's Reports for 1858 and 1860.

‡ See the *Form* of Inquiry and Inspection, pages xxxiv., xxxv.

3d Street; 9 cases; shirt-making carried on in one of the families, and no precautions used; the infected clothing of all the patients was hung out in the open yard; (*e*) No. — Willett Street, and No. — Columbia Street—a grocery; 3 cases of small-pox in each house, and business continued without precautions; (*f*) Nos. — Park Street, 11 cases in families and rooms in which clothing is in process of manufacture for stores in Fulton Street; no precautions; (*g*) No. — Pell Street; 5 cases in families, and rooms where clothing was being made up for wholesale stores; no precautions; (*h*) No. — Jane Street; patient died of small-pox, the infected clothing was sold to an old clo' man; (*i*) No. — Avenue —; 3 patients in room adjacent to the mother's store, where daily papers and trinkets are sold, her business continued, and all customers exposed to the contagion; (*j*) No. — Rivington Street; a child covered with small-pox was lying on the tailor's board with the new clothing that the father was making up for a Broadway store; (*k*) No. — 17th Street, near Stuyvesant Square; 3 cases; their clothing given to a person who took it into a country town, saying she was 'not afraid'; (*l*) No. — Laurens Street; 4 cases in one domicile, and 1 in another; the latter is sick in a bed-room adjacent to his store; the wife alternately attends to husband and to store customers. Thus reads the record of hundreds of cases of this terrible disease visited by our Sanitary Inspectors; and yet with such gross ignorance and recklessness prevailing among the poor in every section of the city, and with a strange and criminal indifference of a great portion of the entire community, no effectual measures have yet been officially adopted to control the spread of this most loathsome pestilence.*

These illustrations, drawn from the most recent and trustworthy observations, are sufficiently abundant and definite to show that the works which are required for the sanitary improvement of our city are of the most practical character. Neither the problems and works of the civil engineer, the daily transactions of commerce,

* A faithful superintendent of public health expresses the views of the medical profession on this subject in the following language: "The extensive prevalence, or long-continued existence of small-pox in any civilized community, is a deep disgrace to that community. It is a disgrace to the authorities, if they do not apply the preventive to the fullest extent possible; it is a disgrace to the people, if they do not avail themselves of the certain preventive which is offered." *Report on Small-pox in the city of Providence*, 1859. By Dr. E. M. Snow, Superintendent of Health.

nor the never-faltering labors of the husbandman, are more practical in their plans, or more certain in their results, than are the problems and works which Sanitary Science proposes. None of these are in the least hypothetical or conjectural, nor can the works of sanitary improvement be wrought out by any theoretical arrangements in social economy, or by the dead letter of mere statutory enactments. Patent and intelligent labor, definite aims, exact statistics, a wise combination of agencies, the coöperation of various departments of knowledge and special skill, are to be invoked and made effective in the prosecution of the various works of sanitary improvement; and whenever the citizens of New York enter upon the works of sanitary reform that are needed in this city, the results will be not less definite and satisfactory, than those which follow their best conducted enterprises of commerce, manufacture, or material improvements of any kind.

EXAMPLES OF SANITARY WORKS AND RESULTS.

It is a humiliating fact that no complete examples of sanitary renovation can be found in the city of New York. The "Five Points" is still full of perpetual fever-nests, and it is the breeding-place of epidemic diseases. Yet the House of Industry, with its cleanly school-rooms and sunlighted dormitories for 200 redeemed children, has driven the demon of fever from the grim hiding-places of woe in "Cow Bay," and a Mission House, occupying the place of the infamous "Old Distillery," has nearly terminated the sway of pestilence and beastliness in another dismal quarter. Individual enterprise and intelligence have developed a few examples of comfortable and decent tenant-houses: the "working-man's home" in Elizabeth Street, and a few respectable cottages for the laboring classes in the Yorkville and Harlem district, have given the best of sanitary results. But not a district nor a street has been redeemed from its filthiness and its endemic diseases. It is true that many sections present a new and more agreeable aspect than formerly, and particular blocks are entirely transformed, but there is no thorough reform. Nuisances of every kind are allowed to encroach upon the most select neighborhoods, new squares along the avenues and streets by the water-sides are being crowded promiscuously by lofty tenant-houses and abominable nuisances; and

even the populated district about the Central Park,* and the poor quarters of Manhattanville, are regions of endemic diseases and perpetual offences against health.

In Philadelphia, Boston, and New Orleans we have witnessed definite results which show very clearly the economical and moral value of certain general measures of sanitary reform. In the city last named the strong arm of a sanitary police, enforced by military authority, has for nearly three years rendered that once unhealthy place at once the most cleanly, and one of the most salubrious ports on the continent. But we must find in the great cities of Europe the parallels of crowding and of sanitary necessities that exist in New York; and fortunately we find in some of those cities the great problems of sanitary improvement satisfactorily solved. The limits of this Report allow us but to allude to them. Let us first look at a general result of the comprehensive but yet imperfect measures of sanitary improvement in the cities and towns of England.

In the 24th Annual Report of the Registrar-General of England (1863), the following significant statement is made: "In 10 years, 1840–'9, the mean rate of mortality in London was 2.51 per cent.; in the subsequent decennium, 1850–'9, it fell to 2.36 per cent. It is still more satisfactory to observe that the rate of mortality *in each of the last three years*, 1859–'61, has been less than the lower of the two rates just mentioned. In 1860 the rate was 2.26; in 1861 it was 2.32. If the mortality of London were confined permanently within the mean rate of the last 3 years, the effect of that reduction, in the population as it exists at present, would be that more than 4,000 persons would survive annually, whose lives would drop under the mean rate derived from the 20 years, 1840–'59. . . . But a higher standard of health than any which the present tables show is possible, and, it is hoped, will be attained."

This life-saving has been attained by the most practical and faithful labors;† definite ends were sought, and positive results

---

* See Reports of Sanitary Inspectors, Twenty-fifth and Twenty-eighth Districts, Second Part.

† The practical working and current results of the Metropolitan Sanitary System of London is instructively stated as follows in a paper entitled *The Work of the Metropolitan Medical Officers of Health, their Success and their Difficulties;* by Edward Ballard,

have been attained. Testimony upon this subject is abundant and convincing. In an address before the Social Science Association of England, 1860, Mr. Edwin Chadwick made these very important statements: "In old dwellings the death-rate has been re-

---

M. D., Medical Officer of Health, and Food Analyst for Islington, etc. It illustrates the working of sanitary measures in London.

Dr. Ballard states that the medical officers of London receive weekly from the Registrar-General schedules of births and deaths in their respective districts. To inform themselves of the presence and locality of sickness, they also have recourse to the admission-books of hospitals and dispensaries, and the books of the medical officers of work-houses, etc. In addition to this, they endeavor to keep informed of the state of health of the better classes through the medium of the neighboring practitioners. Dr. Ballard says:

"On receiving the mortuary schedules, I make out from them a list of the houses where zymotic diseases of an epidemic character have occurred, and these houses are visited either by the Inspector of Nuisances or by myself, and the conditions of drainage, ventilation, water-supply, crowding, etc., are noted down on a form prepared for the purpose. On another form I enter the recommendations for improvements that it is necessary should be carried out. . . . . These recommendations are laid before a committee of the vestry, which sanctions the issue of the requisite orders. . . . . In addition I keep a list of all the streets, courts, and alleys in my parish, in which every week I enter the particular house in which a death has occurred, specifying the character of the disease. . . . . When two deaths are thus found to occur in any house within the year, that house is put upon the list for inspection, and at the close of the year a list of streets is made out in which the mortality has been the highest, and especially in which the infant deaths have been most numerous, and these streets are inspected house by house in the course of the next year. . . . . In this way a system has been brought into operation which works well and readily.

. . . . "It will interest the Association to hear what has been effected in this way during the first five years in which this sanitary work has been proceeding. I have not the data for the whole Metropolis. . . . . In 16 districts only (not half of the Metropolis) we have 25,410 cesspools abolished, and 65,826 houses newly drained or their drainage amended; in 15 districts only, 34,179 privies amended, mostly by conversion into water-closets, and 5,395 houses supplied with water; in 14 districts only, 14,490 yards improved by paving, drainage, or lime-whiting, and 13,926 residences of the poor, at least, cleansed and lime-washed. . . . .

"When they consider the other house-amendments effected, the strict watch which the Health Officers have endeavored to keep over the crowding of tenements, and the occupation of cellars and kitchens as sleeping-rooms, the Association will be enabled to form some imperfect idea of the work accomplished in purifying the habitations of the people, especially of the laboring classes in London.

. . . . "Every slaughter-house in London has been visited and *regularly inspected*, provisions for decency, cleanliness, drainage, and ventilation being in each case strictly demanded, and the requirements of the law as to the erection of new slaughter-houses in the neighborhood of dwelling-houses regularly brought under the notice of the justices at quarter-sessions."

Dr. Ballard further states that efforts have been made to abate the evils of the wretched mode of keeping cows, and purveying unwholesome milk; regular inspections have

duced from fluctuations of from 30 to 40 per thousand, to fluctuations of from 13 to 20, and from 13 to 15 per thousand; from 28 per thousand to 16, from 26 to 17. In particular districts, by one measure alone, by an improved supply of water, and by improved drainage within the houses, abolishing the cesspool and substituting water-closet apparatus, the death-rate has been reduced one-third; that is to say, it has been made as if each third year there was a jubilee and no deaths and no sickness. I have an instance where in an agricultural district, and with laborers alone, by care, the death-rate has been reduced to less than one-half—within twelve in a thousand. From common lodging-houses, containing a population of 80,000, by the enforcement through the police of sanitary regulations, typhus and diarrhœa, as epidemics, are banished. In our well-regulated institutions for pauper children, those epidemic visitations which ravage the children of the families of workingmen are almost unknown, and the death-rate is reduced to one-third of that prevailing among their children. . . . . So certain will the chief data be found to be when competently examined, as to enable a contractor to contract for the attainment of given sanitary results, and he ought, with the requisite powers, to contract for the attainment of given sanitary ends."

The great work of sanitary reforms was commenced in the city of London nearly thirty years ago, and it has steadily progressed, in the face of difficulties such as need never be experienced in our own city, until the annual death-rate of that metropolis has been diminished from 50 in 1,000, to less than 24 in 1,000. With the au-

---

been made of food offered for sale, large quantities confiscated, and sellers fined; and that much has been done in the suppression of trade-nuisances.

"But to all this it may be said, *cui bono?* Is public health improved by all this drainage, house-cleaning, and inspection? Has it improved?"

In reply Dr. Ballard makes the following quotation from the Report of the Registrar-General: "In the 10 years, 1840–'9, the mean rate of mortality in London was 2.51 per cent.; in the subsequent decennium, 1850–'9, it fell to 2.36 per cent. It is still more satisfactory to observe that the rate of mortality in each of the last three years, 1859–'61, has been less than the lower of the two rates just mentioned. . . . . The effect of that reduction in the population, as it exists at present, would be that more than 4,000 persons would survive annually whose lives would drop under the mean rate derived from the 20 years, 1840–'59. And if the measures that have been adopted are not relaxed, the amount of benefit will be increased."—*Transactions of the National Social Science Association*, 1862. Also see *Notes on recent Sanitary Legislation and Reform in London. By* EDWIN LANKESTER, M. D., *Social Science Transactions*, 1860.

thority obtained under various local acts, and particularly by the Public Health Act of 1848, sanitary improvements were carried on with great effect. The sanitary condition of Liverpool and many other large towns was so completely and so speedily changed that popular opinion and practices become important aids in the reformatory works that had been pressed forward by the arm of statutory proceedings. The population of Liverpool, for years prior to 1847, like the population of the unhealthy districts of New York at the present time, were swept into the grave at the rate of 36 in the 1,000 living; but, under the influence of sanitary works, the death-pressure was steadily diminished until at last only 26, or even 24, in the 1,000 die annually. The following figures show how the death-rate and the chances of life have been affected by sanitary improvement in three of the most unhealthy cities of Great Britain: *

	Annual deaths in 10,000 *living.*		*Lives saved in* 10,000 *living.*
	1846.	1859.	*Annually.*
Liverpool,.....	384.....	260.....	124
Manchester,.....	371.....	271.....	100
Glasgow,.....	339.....	278.....	61

Hundreds of illustrations drawn from particular districts and from the smaller cities and great manufacturing towns of England, might be adduced to show how certainly and how speedily sanitary works are followed by a reduction of the death-rate and by an abeyance of fevers and infantile diseases. In Gloucester these works were followed by a reduction of the death-rate from 27.60 to 19.71 in 1,000; in Berwick, from 28.5 to 21.7; and in Macclesfield, after five years of improvement in house and street regulations, and the construction of improved dwellings for the poor, the following results are reported:

"The decrease of mortality ranged from 12 to 60 per cent. As to sickness, the cases attended by the Union surgeons were from 24 to 29 per cent, less; *and police offences were reduced* 24 *to* 55 *per cent.*

"Before the operations of the board, the mortality in the borough, in a period of five years, was at the rate of 33 in a thousand; for the last five years it has been 26 in a thousand. The average age of all who died in the first period of five years was 24

* See Reports by W. T. McGowan, J. Newlands, Dr. Edwin Lankester, and Dr. W. T. Gairdner, in *Social Science Transactions*, 1860.

years; in the last five years it has been 27 years. The last year's average is 28½ years. Three years, at least, have already been added to the life of each inhabitant. Deaths of children under one year have decreased 16.3 per cent.; and those under 5 years, 4.6 per cent. The decrease of deaths is chiefly in that class of diseases which are called preventable. Zymotic diseases have decreased upwards of 27 per cent. These results," say the committee that reports them, "were singularly confined to the localities operated upon." *

But without quoting further illustrations to show the value and certainty of sanitary improvements in cities, we close this section of our Report by referring to the grand results that flowed immediately from the introduction of rational hygienic reforms into the camps, hospitals, and barracks of armies. Official returns give the following among the statistical results of less than four years reformatory work. Says Miss Nightingale: "The *total mortality* at home stations *from all diseases*, is now actually less than was formerly the mortality from chest diseases *alone*." † Among the troops in Jamaica, the death-rate from disease has fallen from 260 per 1,000 to 20; in Trinidad, from 106 to 0 (in 1860); in Barbadoes, from 58 to 6; in St. Lucia, from 122 to 1; in British Guiana, from 74 to 6; in Canada, from 16 to 10; in Nova Scotia, from 15 to 7; in Newfoundland, from 11 to 4; in Bermuda, from 28 to 8; in Gibraltar, from 11 to 7; in Malta, from 15 to 10. Similar results, upon a grander scale, have been wrought out in the vast armies of our American republic. The United States Sanitary Commission started in its sacred purpose of life-saving fully determined that in the volunteer forces "the problems of sanitary science were to be wrought out as a national and patriotic work. The death-rates of the Mexican campaign would imperil the national cause, and bring sorrow to every home in the land. Can the average sickness-rate be kept at a minimum point? Can the average death-rate from disease be reduced to a fraction of that which was registered in the Mexican war? This result the Commission believed possible. It was to be accomplished by *prevention* and by *succor*." ‡ This

* *Sixth Report of the Local Board of Health and Improvement Committee*, Macclesfield, 1859.

† See "*Army Sanitary Administration and its Reform*." By Florence Nightingale.

‡ North American Review, No. CCIII., April, 1864, Article, *United States Sanitary Commission.*

result has been accomplished; and wherever the Commission has brought its influence and its agencies successfully to bear, the rates of disability and mortality from disease have been less than in any other great army, and far less than in the tenant-house population of the city of New York, notwithstanding the hardships and fearful exposures of army life.

PROSPECTIVE VIEW OF THE SANITARY NECESSITIES OF NEW YORK. USES OF SANITARY AND VITAL STATISTICS.

The commerce and confluent wealth of the continent have determined the fact that New York shall for many generations be the most populous city in America. With such a destiny before its citizens they would be recreant to their duty and their manhood if they remained indifferent to the sanitary welfare of the vast population that already crowds this metropolis, and which is rapidly increasing to a number that will exceed the millions of London or Paris. In view of this prospective augmention of population, and an increase of crowding as well as of all the physical necessities and sanitary perils that are attendant upon the commerce of such a city, the Council of Hygiene has deemed it a duty to the citizens who have asked for this Report and for the commencement of sanitary inquiry, to regard the whole subject of sanitary works with reference to the inevitable necessities of the future, as well as of those which are at the present time so urgent.

In laying out its plan of sanitary inquiry and inspection, therefore, the Council has regarded the physical evils and the sources of disease that are now prevalent in particular sections of the city and among particular classes of the population, as portending still greater evils in the future and threatening a vastly greater population. But the investigation of existing wants and of prospective necessities results in discovering the simplest, surest, and most economical remedies for the present as well as the future evils. In most cases the remedies are one and the same: the evils of the existing tenant-house system, and of the overcrowding, filthiness, and neglect of particular localities, may be cited as illustrations.

The present population of this city is believed to be little less than one million. The greater portion of this mass of inhabitants is crowded upon an area of about 15 square miles, including the

entire areas of streets, and the whole commercial district. This gives a population of nearly 100,000 to the square mile, deducting the area of warehouses. Commerce is rapidly encroaching upon the whole district south of Fourteenth Street, and more than half the population south of that line must, in another generation, seek homes beyond that southern district. But the streets and avenues of all the remaining portion of the city and island are sufficiently wide and well arranged to secure the best external ventilation, and, if properly drained and sewered, and always kept clean, all that immense stretch of the newly-built city of dwellings would be capable of affording healthy homes to a denser population than at present exists in any city in the world; and we are warranted in the opinion that within a period of less than eighty years, the entire inhabitable portion of this island will actually have a greater population to the square mile than any other city of the civilized world now has. Hence it is manifestly one of the first duties of sanitary inquiry carefully to estimate the hygienic problems that must be practically wrought out in order to give sanitary security to millions of people thus crowded within a narrow field of brick and mortar, and flanked on either river side by mercantile fleets and warehouses. We need not attempt in this Report to bring forward any speculations upon such questions. It is sufficient to know that great necessities which are as inevitable as they are peculiar to the insular character and unparalleled commerce of our city, are impending and must be met. To evade the responsibility or falter in the duty of meeting the necessities and avoiding the perils that must soon be upon us, and which even now can be practically appreciated by visiting some of the overcrowded districts, should stamp us as unworthy of citizenship in the metropolis of a country like ours.

As we have said in a former section, the progressive sciences and arts, and the genius of the age, can be trusted to work out any problems which hygiene requires to be practically applied. But the fact needs to be borne in mind that while the total population of New York is so rapidly increasing, the relative proportion of the poorer and ignorant classes is advancing by a rapid ratio, for the wealthier classes are as rapidly peopling the entire suburban district over a radius of many miles from the counting-houses of the city. The facts relating to the ratio of increase and

the prospective aggregates and location of the population, are so well presented in a communication recently made to us by Dr. Franklin B. Hough, the superintendent of the Census for the State of New York, that we beg leave to present them here:

"The accompanying table shows the increase and decrease of the population of the city of New York, constructed from the census returns since the year 1790.* The apparent decrease of

* POPULATION OF NEW YORK CITY.

WARD.	DATE OF FORMATION OF THE WARD.	1790.	1800.	1810.	1814.	1820.	1825.	1830.	1835.	1840.	1845.	1850.	1855.	1860.
1st	.....	4,339	7,941	7,630	12,085	9,929	11,331	10,380	10,629	12,230	19,754	13,486	17,373
2d	.....	5,167	8,493	7,439	8,214	9,315	8,243	7,549	6,394	6,962	6,665	3,249	2,507
3d	.....	6,449	7 426	7,495	9,201	10,801	9,599	10,884	11,581	11,900	10,355	7,969	3,757
4th	.....	6,935	10,226	9,856	10,736	12,240	12,705	11,439	15,770	21,000	23,250	22,895	21,994
5th	.....	9,148	14,744	14,523	12,421	15,093	17,722	18,495	19,159	20,362	22,686	21,617	22,337
6th	.....	13,076	11,286	11,821	13,309	20,061	13,570	14,827	17,198	19,243	24,698	25,562	26,696
7th	1791	.....	15,394	12,120	10,886	13,006	14,192	15,873	21,481	22,982	25,556	32,690	34,422	39,982
8th	1803	.....	.....	9,128	10,702	13,766	24,285	20,729	28,570	29,073	30,909	34,612	34,032	39,406
9th	1803	.....	.....	4,719	4,343	11,162	10,956	17,333	20,618	24,795	30,907	40,657	39,982	44,385
10th	1808	.....	.....	10,890	10,824	17,806	23,932	16,478	20,929	29,026	20,993	23,316	26,378	29,004
11th	1825	.....	.....	.....	.....	.....	7,344	14,915	26,845	17,053	27,259	43,758	52,979	59,571
12th	1827	.....	.....	.....	.....	.....	7,938	11,808	24,437	11,652	13,378	10,451	17,656	27,958
13th	1827	.....	.....	.....	.....	.....	.....	12,558	17,130	18,517	22,411	28,946	26,597	32,917
14th	1827	.....	.....	.....	.....	.....	.....	14,288	17,306	20,235	21,103	25,196	24,754	28,080
15th	1832	.....	.....	.....	.....	.....	.....	.....	13,202	17,755	19,422	22,564	24,046	27,587
16th	1836	.....	.....	.....	.....	.....	.....	.....	.....	22,723	40,250	52,882	39,823	45,176
17th	1837	.....	.....	.....	.....	.....	.....	.....	.....	18,619	27,147	43,766	59,548	72,953
18th	1846	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31,546	39,415	57,462
19th	1850	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18 465	17,866	28,252
20th	1851	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47,055	67,519
21st	1853	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,914	49,017
22d	1853	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,605	61,725
Total	.....	33,131	60,489	96,373	95,519	123,706	166,086	197,112	268,089	312,710	371,223	515,547	629,810	805,258

Percentage of Increase and Decrease of Population in the several Wards of New York City, between each Census Period since 1790. [*Shown in percentages upon total Population.*]

WARDS.	1800.	1810.	1814.	1820.	1825.	1830.	1835.	1840.	1845.	1850.	1855.	1860.
1st	.....	84	4	58	—18	14	—8	2	15	61	—32	35
2d	.....	62	—12	10	13	—12	—8	—15	9	—4	—51	—20
3d	.....	15	1	23	17	—11	14	6	3	—13	—33	—57
4th	.....	47	—3	9	14	4	—9	38	33	11	—1	—4
5th	.....	61	—2	—14	22	17	8	4	6	11	—5	3
6th	.....	—14	5	13	51	—32	9	16	12	28	4	4
7th	.....	—31	—10	19	9	12	35	7	11	28	5	16
8th	.....	.....	17	28	76	—15	37	2	3	12	—1	15
9th	.....	...	—8	128	—2	58	19	20	25	31	—1	11
10th	.....	.....	5	65	34	—31	27	39	—38	11	13	10
11th	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	21	13
12th	.....	.....	.....	.....	.....	.....	.....	.....	.....	—22	68	74
13th	.....	.....	.....	.....	.....	.....	.....	.....	.....	26	—6	24
14th	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	2	13
15th	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	7	14
16th	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	—25	13
17th	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	36	23
18th	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	45
19th	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	84
20th	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44
21st	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	76
22d	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	173
Total increase in each decennial Period	83	59	—1	30	84	19	36	17	16	39	20	29
Mean Annual Increase between Periods	8.8	5.9	—0.2	5.0	6.8	3.8	7.2	3.4	3.2	7.8	4.0	5.8

population in some wards is due, in most instances, to subdivision in the formation of new ones; still it is apparent that the population of the lower portion of the island" [city] "is steadily decreasing as the demands of commerce crowd upon the area formerly occupied by families.

"The *future* rate of increase of New York and its dependencies as a great metropolis, may be safely estimated as high as 7 per cent. per annum; although the distribution among wards, and even among counties, depends upon facilities of communications and the demands and location of business.

"The island of Manhattan, the west end of Long Island, the lower part of Westchester County, the neighboring shores of New Jersey, and the north half of Staten Island, are destined to receive an aggregate population greater than that of any metropolis now existing, or that shall then be existing in the world. We do not borrow from imagination; for taking the last census returns of the city of New York, the city of Brooklyn, a third of Westchester, a third of Queens, and half of Staten Island, as constituting the metropolis, we have the following absolute and comparative numbers:

Years.	Aggregate Population.	Percentage of Increase in Last Decennial Period.	Annual Percentage of Increase.
1830	240,827		
1840	392,147	62.8	6.28
1850	693,658	76.9	7.69
1860	1,145,338	65.1	6.51

"While we can foresee nothing that will have a tendency to check the general growth of New York and its dependenices as a whole, there are doubtless many things still unknown, which will tend greatly to accelerate its growth in population and wealth."

"This question," adds Dr. Hough, who is eminently versed in sanitary knowledge and vital statistics, "in view of its vast importance, and its sanitary relations and necessities, demands the earnest and thoughtful consideration of every citizen who has a family to be exposed to disease derived from neglect of public hy-

giene, or property to be enhanced or reduced in value by the security or abuse of sanitary laws."

Here we have a trustworthy and clear statement of the particular laws of increase in population in this city and its suburbs, and is it not the duty of citizens to take wise and forecasting measures to render this the most prosperous and healthful metropolis in the world? Whatever plans of special improvement may be undertaken, their successful prosecution, and the intelligent application of means to ends, must depend upon definite information. Sanitary and Vital Statistics are, therefore, to be gleaned and studied for this purpose. Not only must the registration of Births, Marriages, and Deaths be faithfully attended to as a public duty, but there must be a more intelligent and practical use made of that class of dry statistics; and, more than that, there should at once be put into operation a comprehensive system of sanitary inquiry of a much more *vital* character. Says a very high authority in vital statistics, "We have still much to learn, both as to particular diseases which cause the excessive mortality of unhealthy places, and the nature of the circumstances by which they are produced. The evils which sap the health and shorten the lives of an unhealthy population, which create paupers and augment the public burdens, are multifarious, and require measures proportionably varied for their removal."* The Statistics of Health and Disease must be carefully studied, and the localities, causes, and variations of excessive sickness and death-rates should be constantly noted by competent observers, such as the Sanitary Inspectors who have voluntarily aided this Council of Hygiene.

A great variety of subjects constantly demand, not only the surveillance of sanitary inspection, but statistical registration and skilled analysis.† Such labors ought, of course, to be conducted

---

* See an Essay by Dr. Greenhow, in Transactions of Social Science Association, 1857; pages 365, 387.

† "A watchful care over the health of the people, and a due regard of matters which concern their health, is certainly one of the most important functions of Government. The fact that the subject of hygiene and State medicine have commenced to attract so much the public attention, is undoubtedly owing to the application of statistics to public health. It is impossible for any nation, or for any Government, to remain indifferent when, in figures which admit of no denial, the national amount of health and happiness, or disease and suffering, is determined." *Introduction to Manual of Hygiene.* By E. A. Parkes, M. D., Professor of Hygiene in British Army Medical School, London, 1864.

by the Government, and there should be unceasing effort to secure the intelligent action of legislators upon this and all other sanitary questions. The city and the State have a direct and very important interest in the faithful registration and analysis of this class of statistics.* The office and the quarterly reports of the Registrar-General of England, as well as the masterly labors of the medical officer to the Privy Council, have become powerful agencies in working out the most important social and political improvements in that country; and says a careful observer, "when the effect of all these researches and measures develops itself, it will be seen that even great wars and political earthquakes are really nothing in comparison with these silent social changes." Miss Nightingale, grasping the meaning of truthfully observed facts relating to health, disease, armies, hospitals, and deaths, grouped and focalized those repulsive statistics; and after braving the pestilence of Scutari, and the fever poisons of the Crimean camps, she pointed her deductions directly at the very sources of the chronic evils that had destroyed the flower of the British Army; and, by another presentation of her statistics, the barriers to sanitary reform and rational administration in the army were quickly swept away. The United States Sanitary Commission began and has carried on its good work in the same way, and for more than three years it has maintained a special bureau of vital statistics, which is regarded as one of the most comprehensive of any department of the kind in the world.† All this has been done in the interest of philanthropy; what, then, shall deter the citizens of our vast and wealthy metropolis from substituting for the existing Bureau of Registration, which is practically useless as a sanitary and life-saving agency, such a department of Vital Statistics as will serve the claims of humanity, and become an active agency of social renovation and of economical advantage to the city?

---

* See remarks on this subject in a *Report on the Medical Topography, and Epidemics of the State of New York;* by JOSEPH M. SMITH, M. D. Transactions Am. Medical Association, 1860.

† See United States Sanitary Commission *Documents* Nos. 40 and 46; also, *A Narrative of the Purposes and Works of the United States Sanitary Commission*, 1864.

REMEDIAL MEASURES.

In prosecuting our labors as a Council of Inquiry and Advice, the fact has constantly been kept in mind that a definite knowledge of the maladies to be treated must precede and guide the rational and successful application of appropriate remedies. The sanitary treatment of removable sources of disease and attendant social evils that endanger our city must necessarily be based upon a comprehensive knowledge of the causes from which such evils arise. Chief among those causes of the preventable disease, mortality, and public peril, which this Council and its corps of Sanitary Inspectors have everywhere encountered in their inquiries, are to be mentioned—first, the utter inefficiency and unsuitableness of the municipal health organizations, under which the sanitary wants of the city have for years been increasing; second, the almost universal prevalence of ignorance and apathy among the classes most endangered by their own sanitary wants; and lastly, the absence of an adequate public appreciation of the vital importance of sanitary improvements, and of competent officers of health.

The first sanitary agency which municipal government should provide for this city is *cleanliness*. Yet our Sanitary Inspectors have, throughout the entire period of their labors, reported the prevalence of universal filthiness, the only exceptions being a few streets and places that are daily cleaned by private enterprise. Cleanliness should be enforced in a crowded city like New York at any cost, for by neglecting it the public health is jeopardized, and the social condition of the population becomes debased. Yet it must be borne in mind that an effective sanitary system should extend its functions to other problems than those which relate to cleanliness alone. There needs to be an unremitting inquiry into the circumstances under which particular diseases prevail, or an excessive mortality occurs; comprehensive methods of investigation and improvement must be applied, so as to render the labors of sanitary inspection and research directly tributary to the elevation, intelligence, and self-care of the classes upon whom now fall the heavy burdens of preventable sickness and death; in short, to employ the necessary means to remove and permanently prevent such needless evils. Hence it becomes one of the very first duties of a municipal sanitary system to acquire definite and detailed informa-

tion in regard to the relation of sickness and mortality to particular causes, and to observe the special incidence of those causes and results upon every age and condition in the community. Statistics of disease and of health, of deaths and the removable causes of mortality, should be obtained and analyzed, and practical deductions therefrom should be applied to works of sanitary reform; the insalubrious agency of particular trades, manufactories, customs, articles of food, domestic wants, habits, and social conditions, the local evils, special nuisances, and overcrowding of given areas, and lastly, the sanitary history and results of all works of an improving or an injurious nature should be made the subject of official attention and public record. And not only do the general interests of society require that all these elements of hygienic knowledge should be constantly accumulating and continually applied to practical ends, but the public health, and all the interests of humanity, in a vast and crowded population like that of New York, require that death-rates and sickness-rates, and the prevalence of preventable diseases, should be watched, and that the particular causes of such diseases be unremittingly observed, and their sources controlled or removed. *There must be Officers of Health.**

The scope, methods, and appliances of an efficient sanitary system that shall be found adequate in all respects to meet the wants of the city of New York, ought no longer to be matters of uncertainty or neglect, for upon the prompt and intelligent action of citizens on these questions depends the satisfactory solution of many problems that most vitally concern the physical welfare of the millions who are to inhabit this metropolis—problems that intimately concern the interests of humanity and the silently opera-

* The qualifications and duties of Sanitary Officers are set forth in the following terms by an experienced authority:

"Health being a condition of life, those only who have studied the laws of life, and the external and internal agencies which influence it, can properly be aware to which of these external or internal agencies should be referred deviations from the condition denominated health. Upon a proper discrimination of the causes of disease must ultimately rest the practical usefulness of an officer of health. The officer of health, then, must himself be thoroughly informed in ALL the circumstances which affect the health of man, not only in his isolated condition as an individual, but in his social condition, and in his state of aggregation. He must be intimately acquainted with the habits of the people—moral, social, and physical—and with their various influences on health. The curative physician exerts himself to remedy the results of disease in man as an *individual*; it is the business of the preventive physician to avert these results to man in his *social and aggregate* state."

ting social conditions that affect important interests of the State. The views entertained by the Council of Hygiene in regard to the necessary agencies of sanitary improvement have been incidentally set forth and variously illustrated in other sections of this report. They may be comprehensively defined in the brief words, hygienic inspection and inquiry, sanitary regulations, and sanitary works. Such a system would necessarily provide—

1. That the labors of hygienic inspection and inquiry be systematic, thorough, and unremitting, and that skilled and thoroughly trained minds be employed in such labors.

2. That the officers of health should have the full coöperation of police authorities, and that civic cleanliness and the removal and prevention of nuisances, together with a strict obedience to sanitary regulations, should be enforced by the Metropolitan Police.*

3. That in the practical operations of the new sanitary system useful information and instruction should be so combined with authority as to suggest and directly promote thorough and permanent works of sanitary improvement, and at the same time give a judicious direction to public opinion as well as to individual and associated efforts; and that various works, much needed for such sanitary improvement in dwellings, trades, localities, public places, popular practices, and civic conditions—now insalubrious—be immediately commenced, and by such means rendered successful and publicly beneficial.

These, and many other important results, which need to be attained by a sanitary government, manifestly require the establishment and constant service of an enlightened Board of Health, whose profound knowledge of disease and its causes, and of sanitary science and its practical applications, will successfully direct the various labors of inquiry and inspection, and wisely administer sanitary regulations and laws.

Remedial Measures that cannot Safely be Delayed.—In

* During our sanitary survey of the city, the activity and usefulness of the Metropolitan Police in promoting cleanliness and sanitary care in crowded neighborhoods, have received well-merited encomiums from the Sanitary Inspectors. A statement of some of the results of labor executed by the squad of policemen known as the Sanitary Police Company, will be found tabulated upon a subsequent page. To Captain B. G. Lord, in command of that company, this Council is under obligations for official courtesies and for prompt action upon the information received from the Sanitary Inspectors through the office of the Citizens' Association.

concluding this report it is deemed incumbent upon the Council to call the attention of citizens to the more important sanitary works which cannot be longer deferred without imminent peril to the public welfare. Upon the subjects of which special mention is made in this place, the recent sanitary survey and inspectors have thrown sufficient light to show the necessity of immediately instituting reformatory measures, without waiting the development of a complete system of sanitary government. These measures are presented under the following heads: (1.) Cleanliness of the city. (2.) The ventilation of tenant-houses, etc., and the prevention of overcrowding. (3.) The care of contagious and infectious diseases.

(1.) *Cleanliness and the Removal of Nuisances.*—There can be no apology for the continuance of the universal filthiness that prevails in the streets and passages of the city. The injurious influence of such uncleanliness upon public health does not admit of doubt. Neglected garbage and filthy garbage-boxes, reeking gutters and unswept pavements, dead animals neglected in the open streets, and the transportation of putrid offal, etc., in the most crowded thoroughfares; slaughter-pens and their attendant nuisances in populous neighborhoods, and the uncontrolled elimination of all manner of noisome gases from manufactories of various kinds, are offences against health and decency that ought to be wholly abated and prevented.

The time will undoubtedly come when improved methods and comprehensive considerations of economy will essentially facilitate and cheapen the work of cleaning the city and removing its various sources of public nuisance;* but there exists a *sanitary neces-*

* Probably the time is not distant when the wants of the agriculturist, and skill of the economical chemist, with the aid of sanitary inquirers, will greatly aid the processes of civic cleansing. Says Prof. Liebig: "Of all the elements of the fields which, intheir products, in the shape of corn and meat, are carried into the cities, and there consumed, nothing, or as good as nothing, returns to the fields. It is clear that if these elements were collected without loss, and every year restored to the fields, these would then retain the power to furnish to the cities the same quantity of corn and meat; and it is equally clear that if the fields do not receive back these elements, agriculture must gradually cease. In regard to the utility of the avails of the 'sewage of towns' as manures, no farmer, and scarcely an intelligent man has any doubt." See Liebig's letter to Alderman Mechi, *Vielé on the Economical Disposition of the Refuse Matter of Cities; Transactions National Sanitary Convention.* Boston: 1860. Also, Liebig's *Natural Laws of Husbandry.* D. Appleton & Co.: 1863.

sity for at once enforcing civic cleanliness and the proper control of public nuisances, and this necessity is too imperative to permit the delay of such works until the growing demands of agriculture and the improvements in chemical and other arts of utility come in to lighten, or altogether assume the duties of scavenging and cleansing the city. If there is any force in existing laws and municipal ordinances concerning street-cleaning, and the care of domestic and public nuisances, the public health requires that it should be rigorously passed upon the persons whose duty it is to execute such works. It is proper in this place to call attention to a special source of physiological discomfort and of injury to health, which is also a cause of public nuisance in all parts of the city. From one extremity of the city to the other—excepting in the Central Park—no public provision has been made for the physiological calls of nature, which require privacy. This scandalous want is regarded with concern by medical advisers; but considered simply as a cause of indecency and public nuisance, it should be obviated by suitable municipal care and provision, or by private enterprise, in preparing needed plans and structures. We deem it important, also, to call attention to the preventable nuisances that arise from many of the public and private stables in the city. That many of the stables in the crowded districts act injuriously upon the public health is testified by our Sanitary Inspectors, and yet it is entirely practicable to prevent the principal causes of their offensive and insalubrious character by means of sanitary appliances and regulations. The daily employment of the coal tar or the chlorine compounds, and proper absorbents, would control the elimination of the offensive gases, and by this means, with enforced cleanliness, a serious and growing evil could at once be abated.

(2.) *Ventilation and the Prevention of Overcrowding.*—The excessive crowding, not only of particular localities, but of every district of this city, must be anticipated as an inevitable destiny; but this fact, instead of portending evil to our physical welfare, may justly be regarded as a circumstance that is favorable to the sanitary interests of the millions who will dwell here in future time, if, in consequence of such anticipations, the hygienic necessities which are incident to such aggregation of a population should likewise be anticipated and provided for as they should be. Viewed in this light, as well as in the light of the existing wants of a vast

population, the subject of improved dwelling accommodations is of paramount importance. The successful operations of the proposed department of social statistics and dwelling improvement* will tend to promote such works; yet such are the present necessities of the poorer classes in the city, in respect of healthy dwellings, that there should be no delay, on the part of citizens, in commencing such practicable improvements as will prepare healthy domiciles for the hundred thousand of the laboring classes at present dwelling in overcrowded tenant-houses, that have already become the localizing centres of disease. Upon this subject we submit two suggestions: 1. Let numerous tenant dwellings be constructed for this and other dependent classes, upon plans that shall be fully approved by practical hygienists. 2. Let proper means be immediately devised and put into practical operation for the introduction of adequate ventilation into the faulty tenant-houses of overcrowded localities. In regard to these improvements it will be borne in mind that the preparation of any considerable number of improved dwellings for the laboring classes will be a gradual work, and that in the absence of sanitary laws against the overcrowding of tenant-houses, as well as against faulty construction, there exists an urgent necessity for the introduction of such alterations as will provide for the admission of sufficient air and sunlight to drive from those crowded habitations the causes of typhus and domestic pestilence. The voluntary efforts of proprietors, prompted by any influence that can be brought to bear, and the enlightened enterprise of public spirited capitalists, need to be enlisted in promoting this kind of improvement.† We are not insensible to the fact that it is essential to the ultimate success of any great improvement in tenant dwellings that the improvement itself should be clearly *remunerative*. But there now appears to be no doubt, from the results of experience abroad, as well as from the few individual examples that are presented in this city, that improved dwellings can be made to pay a good percentage, and that the stated payment of rents is much more certain than in ordinary tenant-houses.

---

* See Recommendation [FOURTH], page lxxxix.

† An illustration of the practicability and success of *individual efforts* to secure the transformation of fever-breeding tenements into healthy dwellings has been in progress the past few years in the city of Edinburgh, under the persistent influence and labor of Dr. Foulis. See Dr. Gairdner's *Lectures on Air and Water*, NOTE I.

The importance of at once undertaking, by some practicable means, to secure the improvement of ventilation in the class of tenant-houses that have become fever-nests, cannot be overestimated. Upward of five hundred of these crowded abodes are at the present moment, or have very recently been, visited with typhus fever, and a still larger number of the same class of dwellings have been ravaged by small-pox and infantile diseases during the period of our sanitary survey. Besides these there are between two and three thousand other tenant-houses that are utterly unfit for human habitation unless their ventilation is improved. The work of cleansing, which is required in and about most of this class of tenant-houses, should not be deferred for other improvements, but the public safety, and the claims of humanity, require that by some means the ignorant inhabitants of all these crowded dwellings should immediately have their stifling domiciles ventilated, and at the same time be compelled to keep them free from local filth. The plans by which this first step shall be taken in the hygienic improvement of the common tenant-houses, ought not to be longer delayed by our citizens. Individual effort can, at least, produce examples of the needed improvements, both in old houses and new, and we already have some instructive European examples of the advantageous results of associated efforts and of municipal encouragement in promoting this class of improvements.* It is highly desirable that the dwelling improvements here suggested should be commenced by private enterprise rather than longer to postpone them in the hope of reformatory laws, or of corporate powers; and there should be an accurately kept record of the sanitary as well as the pecuniary results of such works of improvement, with the design to guide and encourage their further prosecution.

Considerations of public safety and the future welfare of the city demand that we should look well to the causes that are inducing excessive overcrowding, and sanitary neglect in particular districts of the city, and among particular classes of our population. Comprehensive plans and practical efforts can avert serious evils that

* See papers by Henry Roberts, Esq., on the *Progress and Present Aspect of the Movement for Improving the Condition of the Laboring Classes; and, Examples of Efforts to Provide Improved Dwellings for the Working Classes. Transactions of Social Science Association*, 1860.

are now rapidly increasing, and which will not easily be overcome if longer neglected. The causes which are now herding nearly half a million of the inhabitants of this city in densely packed tenant-houses, that are unnecessarily aggregated upon limited areas, may now be controlled; and, although this metropolis shall double its population every fifteen or twenty years, as it probably will, its public health may nevertheless be securely guarded if the laws of public hygiene have sway in the distribution and sanitary regulation of the inhabitants and their dwellings. The island upon which the city is situated embraces about thirty-five square miles, more than twenty of which are destined to be occupied by the dwellings of its inhabitants.* Upon this very limited insular area it will become the duty of the sanitary authorities of the city and the State to guard the health and safety of a population exceeding three millions of people at a period that some who are now living may yet see. And shall the evils which now prevail in particular districts that have reached the maximum rate of population be perpetuated and entailed upon future generations when the whole city will be thus densly populated? The present and the future consequences of overcrowding and of the neglect of sanitary regulations and forethought concerning the distribution and police of tenant dwellings can be reliably stated and solved as problems in sanitary science. Upon this point it may be proper to present an illustration of the logical and mathematical precision with which a single one of those problems is wrought out, and its results applied.

Typhus fever, as we have stated in a preceding section, owes its origin to overcrowding, uncleanliness, and want of ventilation; and it is preventable by means of fresh air and cleansing. This simple problem in hygiene has been repeatedly wrought out in the dwelling improvements of the poorer classes in the great cities of England; but its scientific solution has been clearly stated in the following terms: "Among the more common sources of typhus

---

* "The health of any city depends, in no small degree, upon the distribution of the inhabitants over an area of sufficient extent to admit of the free ventilation of every dwelling. When such a distribution obtains, and attention is given to personal and domestic cleanliness, a population of 200,000, or any greater number, will be as secure against the invasion of typhus as are the inmates of a commodious, cleanly, and well-aired private dwelling." *Report of Committee on Public Hygiene*, by Joseph M. Smith, M.D. *Transactions American Medical Association*, 1850, page 237.

fever are the effete matters of the human body, accumulated and long retained in dwelling places. The facility and promptness with which such accumulations take place in the crowded homes of the poor, may be readily explained by calculating the amount of materials excreted from the lungs and skin of a definite number of individuals living in the habitation. . . . The mass of such matters thrown out by the lungs and skin by a family of ten persons, within their dwelling, where their average time indoors is twelve hours each day, is 500 lbs. every month, and in one year it is 6,083 lbs. 4 oz. The ejected animal matter alone, would amount in one month to 6 lbs. 3 ounces, and in one year to 76 lbs. . . . If we extend this mode of investigation to a number of families, residing in contiguous tenements, we shall obtain results which may forcibly impress the public hygienist. . . . The inhabitants of a densely populated town may be regarded as a single family, living in contiguous or narrowly separated apartments, any one of which may be as certainly and speedily rendered infectious as the cells of a prison."* By experimental researches it is shown that the animal exhalations in crowded and unventilated apartments, are of themselves so poisonous as to destroy life, and that the same poison, when introduced directly into the blood, or long inhaled, though diluted, produces exhaustion and fever, and other marked conditions of disease.† Even the casual observer could

* See *Report on Hygiene*, before mentioned (page cxxxiv., note), by Joseph M. Smith, M.D. The concluding remark in the report here referred to, may very appropriately be quoted in this place. The reporter states that: "As in such situations, typhus and other forms of disease unquestionably originate, it follows that the means of preventing the evil is to limit the number of inmates in apartments of given dimensions; and to provide dwellings with suitable apertures and sufficient spaces around them for ventilation. Such sanitary measures, with attention to personal cleanliness, carried into effect by an efficient police, would put a period to the prevalence of the disorders referred to, and at the same time minister a wholesome rebuke to the mercenary spirit of proprietors and landlords."—*Report*, Ibid., page 246.

For further practical statements upon the subject of overcrowding and want of ventilation as the causes of typhus and crowd-poisoning, we would refer to the *Reports of the British Poor Law Commissioners;* the *Metropolitan Sanitary Commission*, of London; the Reports of Dr. Southwood Smith and Dr. Duncan, on *Fever Districts, etc.;* Dr. J. H. Griscom's treatise on the *Uses and Abuses of Air; A Report on Cholera in England*, by Drs. Baly and Gull; and Drs. D. B. Reid and E. Harris on *Ventilation in American Dwellings.*

† For valuable statements upon this subject, see Chapters II. and XVIII. Dr. Wm. H. Hammond's *Treatise on Hygiene;* the testimony of Dr. Guy, and Dr. Southwood Smith, in *Report of Health of Towns Commission*, vol. I., and the ingenious studies of Thomas

not fail to notice the outward signs by which this crowd-poison manifests itself in the sallow and spiritless inhabitants of unventilated tenant-houses and cellars in our city; and while this special cause of typhus, and of that vital decay grimly termed "tenant-house rot," is doing its fatal work among the poor, and already extending its fever-infection after the manner of the prison-passages and neglected prisoners of the "Old Bailey," and the "Black Assizes," the same neglect of ventilation is producing consumption, scrofula, rheumatism, and a multitude of incurable and pauperizing maladies that result from want of fresh air. The definite knowledge furnished by physiology and animal chemistry, enable the sanitary inquirer to estimate the period in which the lives of the occupants in crowded apartments would become extinct in consequence of the exhaustion of oxygen and the poisoning by carbonic acid and the animal exhalations.

In many of the tenant-houses our Sanitary Inspectors found the allotment of space and air-supply so small that, but for a precarious and scanty ingress of fresh air by crevices and unopened windows, whole families would inevitably perish in periods of from eight to thirty-six hours. In some domiciles with large families, the allotment of air-space is less than two hundred cubic feet to each person, and we know that in 1,487 of the tenant-houses of our city the pro-rata allowance of cubical space to each inhabitant is less than 400 feet. These houses are perpetual fever-nests, and it is believed that the medical evidence which has been brought forward in this Report should warrant compulsory measures to effect the ventilation of that class of dwellings for the poor and the ignorant, in which fever-poison and the diseases of overcrowding are now generated. If there is neither sanitary regulation nor law that can be applied, still we may, as citizens and philanthropists, do much by voluntary agencies to induce a proper distribution of the population, and to secure the introduction of needed improvements in the ventilation and sanitary care of the crowded homes of the poor, and in the school-rooms, public halls, hospitals, asylums, and workshops where there now exist great and needless perils to health.

Taylor, Esq., concerning air-poisoning in crowded dwellings.—1*st Report of Metropolitan Sanitary Commission.* For some results of exact chemical inquiry respecting the contaminated air of dwellings and cities, see Papers by Dr. Angus Smith in *Quarterly Journal of the Chemical Society*, No. 43.

(3.) *Sanitary Care of Contagious and Pestilential Diseases.*—(*a.*) Upon this subject the Council recommends that sanitary regulations be enforced, with heavy penalties, against the owners and drivers of hacks and public vehicles, who are guilty of transporting persons with small-pox without notifying the proper sanitary officer of the city, or who shall allow any vehicle that has been so employed to be publicly exposed, or in any way occupied by other persons without official permission. Also, that it be made a punishable offence for any person or thing that is contaminated with small-pox to be unnecessarily exposed, so as in any manner to spread the contagion to other persons. (*b.*) *Vaccination.*—In reference to the means of extending and insuring the benefits of the vaccine protection to the greatest number, and to all classes of persons, it is recommended that some properly organized effort be made by the citizens of New York to prevent the neglect of vaccination, and at the same time to secure the adoption of a proper supervision and care of its practical application. From the period when Jenner perfected his great discovery by devising *perfectly reliable methods* of applying the vaccine lymph, until the present time, there has been, on the part of vaccinators, so much inattention to the essential conditions of success in so selecting and applying the lymph as to insure its protective operation, that it becomes highly important to have the supply, the distribution, and the (gratuitous) application of the vaccine virus committed to some competent supervision.* The public Dispensaries of this city have long been our chief and best sources for supplying the vaccine virus, and they are very properly the accepted agencies of its gratuitous application, and did the people of the city and of the State of New York fully understand the extent of the benefit that has been thus conferred by these excellent institutions in this branch only of the services they render to the public, it is believed that adequate means would be voluntarily provided to place their

* Practical information of the most valuable character relating to the prevailing defects, and the essential conditions to *protective* success in vaccination, has been accumulated by Dr. Simon, Mr. Ceely, Mr. Marson, and others in England, and by Dr. J. P. Loines, of New York. As Medical Officer to the Privy Council, Dr. Simon has extended the inquiry upon this subject to definite results. Of these, the following are most important: (1.) The "very imperfect and insufficient way" in which vaccinations are commonly performed. (2.) Imperfect and untrustworthy results following the employment of *preserved* lymph.—See *Sixth Report of the Medical Officer to the Privy Council*, Appendix, 1863.

vaccine department upon the improved basis which the public welfare requires. But there needs to be a skilled supervision of public vaccination; and by every moral and persuasive agency, if not by compulsory measures, every person in the community should receive vaccination; and in a city like New York it is peculiarly necessary that no pains be spared to render this work of protection against small-pox as effective and universal as possible. In addition to the skill and supervision that are required, it is necessary that a system of house-to-house inquiry and advice be established in all the tenant-house districts of the city, so that at least twice in each year all of the poor and ignorant classes shall be fully insured by competent medical authority. But in the opinion of most physicians, and of many of the ablest judicial minds, public vaccination and the measures for rendering it universal, constitute one of the few obligations in which the duty of the individual and the duty of society or the State are so reciprocal and so absolute, that compulsory regulations requiring it are not inharmonious with the spirit of our laws. Whatever views may be entertained upon this question, it is plainly our duty to employ every available voluntary agency to render the benefits of vaccination both universal and in the greatest degree trustworthy, and to employ every means of persuasion and encouragement to all classes in the community to accept the benefits thus offered. Hundreds of persons are killed by small-pox every year in our city in consequence of the neglect of vaccination, and the skilful management of its application. For such deplorable and needless waste of life, the intelligence of the community should be held morally responsible.

(*c.*) *Fevers.* Not only are the causes which primarily originate the typhus and typhoid fevers entirely preventable, but the various agencies by which the infection from the sick is communicated to other persons and other places may be controlled, and the diffusion of the fever-poison wholly restrained; the instances related in a previous section of this Report sufficiently illustrate the importance of providing a system of sanitary watchfulness over the domiciles and neighborhoods where typhus fever occurs. Though it is the offspring of overcrowding and want of pure air and pure aliments, its power of infection is a fearful evil in populous neighborhoods. The local causes of the enteric or typhoid fever are also of a removable nature, and so unsuspected are they, often, that the pub-

lic welfare requires there should always be competent sanitary care over the prevalence of this fever, in order, as in the case of typhus, to restrain the causes of its further extension, and at the same time mitigate its severity wherever prevailing. It is manifestly necessary, therefore, that skillful medical experts should be employed for this and similar services, as we have previously recommended; and, in addition to this, we deem it important that all physicians and benevolent persons who attend upon families suffering from continued fever, in either form, should be alive to the importance of inculcating proper instructions concerning the removable causes of these maladies, and that they should employ all suitable means to procure the immediate execution of needed sanitary improvements wherever they discover the presence or the causes of these forms of fever. From the commencement of the work undertaken by the Sanitary Inspectors they voluntarily assumed this kind of duty; and while they discovered the prevalence of deplorable ignorance and want respecting both the specific and the localizing causes of fever, they served as the willing and faithful agents of their profession and the Citizens' Association, in imparting needed counsel and restraining the increase and diffusion of fever-poisons. Commissioned or uncommissioned by Government, such services by medical experts should be unceasingly in operation.*

---

* The practical value of skilled inquiry and advice respecting the preventable causes of fever and other pestilential diseases has been well illustrated in all the great cities which have a well-organized medical police; but in the city of New York the voluntary visits and advice of a few Dispensary physicians, has been the nearest approach to any system of sanitary aid and protection enjoyed by the city, excepting only the temporary plans of medical inspection adopted during the prevalence of cholera, and the more complete methods which have been carried into operation by the Council of Hygiene and its corps of medical assistants. However valuable such voluntary service may have been, the absence of power to enforce any of the advice thus gratuitously given, has rendered much of that counsel of no effect where and when it was most needed. With truth does the Sanitary Inspector of the Twentieth District testify, as the result of experience, that, had the Inspectors been invested with legal authority, they "could easily have instituted a thorough sanitary reform throughout the city." (See SECOND PART, page 248.)

With typhus-fever and small-pox in nearly ten thousand domiciles of the poor and the ignorant, where every circumstance favored the localization of infection and the propagation of disease, and where gross nuisances, and criminal negligence of cleanliness, ventilation, and medical police, demanded the presence of intelligent authority, the Sanitary Inspectors justly conclude that the work of sanitary improvement should, if possible, be enforced by legal authority; yet, without the aid of such authority, they have given such counsel and instruction as they could, and have occasionally sought the aid of the Metro-

There are various other sources of preventable disease of a specific character, as well as certain causes of general impairment of the public health, that should be subjected to the constant surveillance of a competent medical police in our city; and concern-

politan Police. The records of many a fever-nest during this survey have shown that the legislative and judicial power of an intelligent Board of Health was as indispensable as the executive authority of the Police. In some instances the incursions of fever into crowded tenements ravaged every family, and not infrequently broke up large families, making fatal victims of the parents, and pauperizing their surviving dependents; often the fever has swept through the front and rear domiciles of populous tenant-houses, and thence has been widely diffused by the constantly-changing tenants. At the same time the local conditions that produce the typhoid or enteric form of fever exist and increase unrestrained by municipal authorities; yet experience and sanitary science have clearly shown that the causes of fever are as amenable to hygienic regulations and the control of a sanitary police as are the transgressors and enemies of the civil laws to the restraints of those laws.

Sanitary inspection and the faithful execution of sanitary laws and regulations should, if possible, accompany any effort that may be put forth for instructing the ignorant classes in the duty of self-care against fever and pestilential diseases. We have shown how this duty is performed by the metropolitan officers of health in London (See page cxv); and to illustrate the principle upon which such official labors can be organized, the following passage is quoted from a report by Dr. Simon, on the organization and aims of sanitary inspection and inquiry:

"In order that any Committee, acting for sanitary purposes within the city, shall have reasonable chance of success in its endeavors for the public good, the following means of information will be necessary for use:

"1. That an account should be kept, corrected year by year, of every house within the city, as to the area of building, the number of floors, rooms, windows; as to its ventilation; as to its drainage, water supply, and other facilities for cleanliness; as to its method of occupation, and number of inhabitants.

"2. That from this account there should be made out, at least twice yearly, a list of houses and streets remaining in an objectionable sanitary state; and a list also of such as may have been remedied to the satisfaction of the committee, since the formation of their last preceding list.

"3. That, while trades injurious to health or offensive to their neighborhood, are suffered to continue within the city, there shall be given periodical reports on the condition of such establishments, to the end that they be maintained so as to be least detrimental to the public health.

"4. That record of every death registered as occurring in the population of the city should lie before the committee; and

"5. I consider it quite indispensable that they should likewise receive the largest and most accurate returns which can be procured of all sickness occurring among the poorer classes; and particularly in respect of all epidemic, endemic, and infectious disorders, that the medical practitioners who communicate the fact of illness should likewise report the existence of any local causes, or other influences of general operation, which have tended to produce, or are tending to continue, such illness.

"As I formerly stated by anticipation, so now I repeat from experience, that nothing deserving the name of sanitary administration can exist in the city without accurate pe-

ing some of them it is highly desirable that special investigations should be made, and that hygienic reforms should be suggested and encouraged. Among the more important of these should be mentioned the sanitary regulation of school-rooms and the hours of study; the diseases which are incident to ignorance and neglect of sanitary knowledge in various trades and industrial occupations, particularly of such as now induce pulmonary consumption; the defects and misuses of the quarantine or external sanitary system of New York; the necessity of sanitary care for syphilitic and certain other constitutional diseases among the ignorant classes; the removable causes of excessive infantile mortality; the importance of improved facilities for bathing and cleanliness in tenant-houses; and the necessity and means of providing better nursing and care for the sick poor.

---

riodical intelligence of all such sickness at least as comes under parochial treatment, or without such reports on the local sanitary conditions and other causes of disease as were desired to accompany that intelligence. No health committee can exist for a month without it; nor can any officer, having proper respect for his character, consent to be considered responsible for the health of a population whose illnesses he learns only from their post-humous record in the death register.

"During the recent prevalence of cholera, the health committee established a system of daily reports. What needed to be daily, during a period of pestilence, might fitly become a weekly communication at all other times. * * * * * * * * * * * * * * * * *

"Accordingly, I have to recommend that any committee which may undertake the administration of sanitary affairs for the city shall be furnished as completely as possible with information of the nature I have specified.

"Another element to which I think it necessary to advert, in connection with a future sanitary organization for the city, is this: that some permanent arrangement should be made, by which the maintenance of exterior and interior cleanliness, the enforcement of scavengers' duties, the suppression of nuisances, and the like, should be brought under habitual and systematic surveillance; one by which all breaches of your present or future sanitary regulations may be quickly detected, and may be visited with their appropriate penalties as speedily and as certainly as possible.

"It is in respect of matters of this sort, and of such only, that I think the services of the police force might usefully be employed. Their want of special education, and their employment in other duties, are circumstances which appear to me quite conclusive for objecting to their utilization as sanitary reporters. But while I entertain the opinion that their employment in the latter direction would be both fruitless and inconvenient, I would submit that their numbers and their diffusion through the city qualify them well to act against all causes of nuisance, as they act against other offenders, both detectively and preventively."—*Report on the Sanitary Condition of the City of London, for the year* 1848–'49. By JOHN SIMON, M.D., *Officer of Health.*

In concluding this Report we would state that many of the subjects to which it relates are of a character so plainly designating them as legitimately requiring the interposition of legislative and police control that it has appeared inexpedient for the Council to enter upon any detailed description of the needed remedial measures. The objects sought by the Council will have been attained if its sanitary survey of the city, and its analysis and exposition of the hygienic wants of the population, should lead to a more definite and popular appreciation of the value and necessity of sanitary regulations and sanitary works, and to a general regard for the LAWS OF HEALTH.

The voluntary labors of inspection and inquiry, upon which this Report is based, were prompted scarcely less by deep convictions of the claims of humanity and of society at large, than by the urgent solicitation of the Citizens' Association of New York, for whose consideration it is now submitted. With an obvious necessity for such efforts by *voluntary* agencies; with an increasing prevalence and neglect of the removable sources of disease, particularly of fevers, small-pox, and other fatal maladies; with the fearful overcrowding and sanitary neglect of the tenant-houses, and the ignorant and dependent classes of the city; and with the claims of our vast armies, that its brave men should neither encounter needless dangers from communicable maladies at this chief mart of transportation, nor themselves become the agents and victims of epidemics that so commonly follow in the path of wars; together with the growing evils of a defective sanitary government of the city, the rapid increase of our population, and a corresponding increase of its hygienic necessities and perils, rendered it plainly our duty to respond to the request of our fellow-citizens in as thorough and practical a manner as possible.

With as little delay as practicable, the Council and its corps of Sanitary Inspectors entered upon the proper hygienic inquiries that should serve as a basis for the advice and coöperation which the Association and the public might justly require. The plan of these inquiries was comprehensive and definite. The methods of the undertaking have consisted in the organization and distribution of labors which, as physicians, we believed to be both practicable and necessary as the basis of sanitary works in this city. Of course, in so short a period, and with other duties pressing upon our time

and attention, it has been impossible to present as complete results as the importance of such subjects of inquiry demand; yet in some of the inspection districts, and upon some of the more urgently important subjects of investigation, we have reached such results as most need to receive the public attention. In some districts, as in the Third, the Fourth, the Eleventh, the Twelfth, the Eighteenth, the Twentieth, and the Twenty-fifth, it was found practicable to give more special completeness to the inquiries concerning the localizing causes of disease, as well as regarding the attendant physical and social wants, than in some of the others;* but in all of the districts there has been a vast amount of laborious research, of which the evidence cannot be presented in this Report.

Definite information respecting the nature, the causes, the extent, and the circumstances of preventable disease, excessive mortality, social debasement, and pauperism in our midst, cannot fail to produce convictions of public duty; and it is for this purpose, and not from any willingness to expose the shame of our city or the woes of ignorance and poverty, that we allow many disagreeable details of illustration to enter into this Report. To the physicians who have been engaged in these labors, the ultimate results of their inquiries, and of the sanitary works which they see to be necessary for the redemption of the dependent and suffering classes from pauperizing and fatal burdens, and which, as physicians, they equally well know to be vitally important to the public welfare, seem to be, and they certainly are, too momentous to be postponed for the possible enactment of compulsory laws which may yet be se-

* It is scarcely necessary to state that, as the primary object of the Sanitary Survey was the acquisition of definite and complete information regarding the hygienic condition of every street and block in the city, the special reports which the Council now submits as a body of evidence by no means convey an adequate idea of the labors performed and the records made by the individual inspectors. Particular success in *completing* certain branches of sanitary inquiry was, of course, to be attained only in the smaller or the more sparsely-inhabited districts, as for example in the Fourth Ward. In that district the inspector and his assistant were enabled to carry out the purposes of the Council very fully in regard to social statistics, overcrowding, and the aggregation and neglect of tenant-houses, in their relation to life and health. Similarly thorough, though less complete, studies in this and other branches of the inquiry, have been made in several districts, but, for obvious reasons, the social and sanitary chart, which we have caused to be prepared to illustrate a particular branch of inquiry in a single district, may serve as a general illustration of the purposes and the thoroughness of the survey. [See the Social and Sanitary Chart, in *Fourth District Report*, SECOND PART.]

cured under the operation of increased popular intelligence or under the terror of disastrous epidemics. In the spirit of their vocation, as observers and interpreters of the laws of health and disease, they would invoke the intelligence and public concern of their fellow-citizens to serious consideration and action upon the facts submitted in this Report, and would urge that the most needed and practicable plans of voluntary works of sanitary improvement be speedily undertaken, and that earnest and unremitting efforts be made to secure the adoption and success of the sanitary regulations, which are necessary for the protection of life and health. Persistent and wisely-directed efforts, the diffusion of popular information, together with the influence of successful examples of sanitary works, and the operation of sanitary regulations in special instances, may eventually give popular success to the duties and the laws of a good sanitary government.

Earnestly as we would strive to secure the application of adequate laws for the improvement and protection of the public health, we would, with equal earnestness, and for the same ends, urge that individual and organized efforts be put forth, for all these agencies must eventually coöperate in giving to the population of this city that protection to life and health which an enlightened people claim to be due to all classes of society. Though now, in the midst of a national struggle against a terrible rebellion, the work of local improvements and the progress of sanitary science need not and must not be wholly interrupted. The mental activity and popular energies that characterize the present period need to be directed to lasting and life-saving works that shall strengthen the present and benefit all future generations. "Peace has its victories as well as war," says one of the most practical philanthropists of our day; "and it also has its unnecessary losses from disease and death; only the losses of peace are greater than those of war, because they are daily and constant." *

Whatever may be the circumstances that favor or retard the commencement and progress of sanitary works, it appears to be plainly the duty of enlightened citizens to enter upon comprehensive and untiring efforts that shall ultimately overcome the evils which we have described in this Report. Come what events there

* Florence Nightingale: *Sanitary Reform under Lord Herbert.*

may to affect the physical, social, political, or commercial interests of the city, let it be borne in mind that Sanitary Science and its preventive skill are of more value to our fellow beings and to this city than all the curative arts of medicine and surgery; that the evils which now bear so heavily upon the poorer classes already seriously endanger the sanitary safety of all other classes, and multiply the social perils and public burdens of the city; that a practical and comprehensive application of sanitary knowledge in specific works of improvement is both necessary and competent to rescue the city from existing evils, and to guard it from the far greater perils that are impending; that a careful regard for human life and welfare is an unerring index of social advancement; and that it is an imperative demand of civilization and a duty to humanity to seek out and restrain the preventable sources of disease, debasement, and pauperism, which, in the city of New York, are found closely allied. To show by what agencies and to what extent human life and the public health in this city are needlessly and wrongfully endangered, and to point out some of the most important means of sanitary improvement, we submit this Report with the accompaning body of Evidence.

JOSEPH M. SMITH, M.D., *President*,
WILLARD PARKER. M.D., *Vice-President*,
VALENTINE MOTT. M.D.,
EDWARD DELAFIELD, M.D.,
ALONZO CLARK. M.D.,
GURDON BUCK, M.D.,
JAMES R. WOOD, M.D.,
JAMES ANDERSON, M.D.,
CHARLES HENSCHEL, M.D.,
ALFRED C. POST, M.D.,
ISAAC E. TAYLOR, M.D.,
JOHN W. DRAPER, M.D.,
R. OGDEN DOREMUS, M.D.,
STEPHEN SMITH, M.D.,
HENRY D. BULKLEY, M.D.,
ELISHA HARRIS, M.D., *Secretary*,

Members of the Council.

THE ROYAL SANITARY INSTITUTE
LIBRARY

Second Part.

EVIDENCE.

REPORTS

OF THE

SANITARY INSPECTORS.

SANITARY INSPECTORS AND THEIR DISTRICTS.

FIRST DISTRICT,	Dr. Joseph A. Monell, *Sanitary Inspector.*
SECOND DISTRICT,	Dr. Isaac L. Millspaugh, *Sanitary Inspector.*
THIRD DISTRICT, (*Section A,*)	Dr. Hampton Harriot, *Sanitary Inspector.*
THIRD DISTRICT, (*Section B,*)	Dr. B. M. Keeney, *Sanitary Inspector.*
FOURTH DISTRICT,	Dr. Ezra R. Pulling, *Sanitary Inspector.*
FIFTH DISTRICT, (*Section A,*)	Dr. Everardus B. Warner, *Sanitary Inspector.*
FIFTH DISTRICT, (*Section B,*)	Dr. James W. Purdy, *Sanitary Inspector.*
SIXTH DISTRICT,	Dr. Wm. F. Thoms, *Sanitary Inspector.*
SEVENTH DISTRICT,	Dr. P. Nolan, *Sanitary Inspector.*
EIGHTH DISTRICT,	Dr. J. T. Kennedy, *Sanitary Inspector.*
NINTH DISTRICT,	Dr. Oscar G. Smith, *Sanitary Inspector.*
TENTH DISTRICT,	Dr. John C. Acheson, *Sanitary Inspector.*
ELEVENTH DISTRICT,	Dr. James L. Brown, *Sanitary Inspector.*
TWELFTH DISTRICT,	Dr. F. A. Burrall, *Sanitary Inspector.*
THIRTEENTH DISTRICT,	Dr. Robert Newman, *Sanitary Inspector.*
FOURTEENTH DISTRICT,	Dr. E. W. Derby, *Sanitary Inspector.*
FIFTEENTH DISTRICT,	Dr. James Ross, *Sanitary Inspector.*
SIXTEENTH DISTRICT,	Dr. W. C. Hunter, *Sanitary Inspector.*
SEVENTEENTH DISTRICT,	Dr. Guido Furman, *Sanitary Inspector*
EIGHTEENTH DISTRICT,	Dr. H. M. Field, *Sanitary Inspector.*
NINETEENTH DISTRICT,	Dr. J. R. Mansfield, *Sanitary Inspector.*
TWENTIETH DISTRICT,	Dr. E. H. Janes, *Sanitary Inspector.*
TWENTY-FIRST DISTRICT,	Dr. James L. Little, *Sanitary Inspector.*
TWENTY-SECOND DISTRICT,	Dr. R. L. Parsons, *Sanitary Inspector.*
TWENTY-THIRD DISTRICT,	Dr. Ellsworth Eliot, *Sanitary Inspector.*
TWENTY-FOURTH DISTRICT,	Dr. Robert Stewart, *Sanitary Inspector.*
TWENTY-FIFTH DISTRICT,	Dr. J. Lewis Smith, *Sanitary Inspector.*
TWENTY-SIXTH DISTRICT,	Dr. H. Mortimer Brush, *Sanitary Inspector.*
TWENTY-SEVENTH DISTRICT,	Dr. Alexander Hadden, *Sanitary Inspector.*
TWENTY-EIGHTH DISTRICT,	Dr. L. A. Rodenstein, *Sanitary Inspector.*
TWENTY-NINTH DISTRICT,	Dr. J. O. Farrington, *Sanitary Inspector.*

REPORT

OF THE

FIRST SANITARY INSPECTION DISTRICT.

JOSEPH A. MONELL, M. D.,
Sanitary Inspector.

BOUNDARIES.—*This district is bounded north by Reade Street, east by Broadway, south and west by the North River. It comprises part of the First and the whole of the Third Ward.*

TOPOGRAPHY.—That part of the district lying between Greenwich Street and the North River is nearly level, and is but little elevated above tide-water. The portion east of Greenwich Street rises gradually and uniformly until it reaches the height of 20 to 35 feet above tide-water at the line of Broadway. The former, or level portion, is wholly of made ground, lying almost entirely outside of the original shore-line; that line very nearly corresponding with Greenwich Street, but at some points reaching further eastwardly. This artificially-formed portion of the district was mainly filled up with earth taken from the more elevated sections of the island. The portion of the district east of Greenwich Street is composed of natural sandy alluvium, and, from its porosity and elevation, constitutes a favorable basis for the location of human habitations; but, on the contrary, the artificially-formed, or level portion, from its slight elevation above tide-water, is constantly saturated with moisture, so that cellars and basements of dwellings erected on it are damp and insalubrious, and at times, during very high tides, wholly untenantable; while, from its too level character, its drainage is imperfect and its gutters constantly filled with filth. The influence of these topographical conditions upon the public health is chiefly evident in two important particulars: Firstly, the dampness of basements and cellars located upon made ground of so moist a nature, is largely productive of rheumatic and other inflammatory and chronic disorders in those who from necessity or otherwise are forced to occupy them; and, secondly, in those level streets the accumulation of street filth, garbage, and house-slops, is much more rapid

than in those streets where an inclined grade insures good drainage; and, as a consequence, they emit emanations most intolerable to the senses and very highly deleterious to health.

STREETS.—The streets of this district are quite regular in their arrangement, particularly in its upper half. They are, for the most part, straight and of good width. The exceptions are Morris, Rector, Thames, Carlisle, Cedar, Temple, Edgar Streets, and Trinity Place, which are so narrow as barely to afford space for ordinary vehicles to pass each other. Greenwich, Washington, and West Streets run nearly due north and south, parallel with the North River and with each other. Broadway diverges somewhat from the direction of these streets in a more northeasterly course. The remaining streets, except Trinity Place, College Place, Church Street, and Temple Street, traverse the district at right angles with Broadway.

Broadway is paved with the Russ pavement, which is superior to all other kinds in durability and cleanliness, but it has unfortunately become so smooth that it affords an unsafe footing for horses. Battery Place, Fulton, Greenwich, Chambers, and parts of Washington, West, and Reade Streets, and Park Place, are paved with Belgian pavement, which has most of the advantages of the Russ pavement without its slippery character. Cortlandt Street was partly paved with iron blocks, but these have in part been replaced with Belgian blocks. The remaining streets and alleys of the district are paved with cobble stone, and in several places have been much broken up during the past summer.

This kind of pavement has two marked disadvantages: In the first place, from its instability it is frequently out of repair, thereby greatly impeding the passage of heavy loads. In the second place, cobble-stone pavement, from its greater inequality, retains much more street filth and is with more difficulty cleaned than Belgian pavement, and in a proportionate degree the atmosphere is rendered impure. This has been the case in a marked degree during the past summer in Morris, Rector, Carlisle Streets and parts of Washington Street, all of which have been much of the time in a very filthy state. Although this is true of all streets where a tenant-house population is found, whatever the kind of pavement, still the difference between the cobble stone and Belgian pavement in the above-mentioned particulars has been too marked to escape the notice of the most casual observer.

SEWERAGE.—All the principal streets of the district are provided with sewers, except here and there a short space not essential to the general system. These sewers empty into the river between high and low water. While the street sewerage of the district is thus general,

there are still numerous buildings that have no sewer connections, and many of these are dwellings. The absence of such sewerage is a serious evil, as without it drainage is imperfect, and pure air an impossibility. Waste water and house-slops of all kinds are deposited in the adjacent gutters to corrupt the atmosphere, while the contents of privies accumulate for months, and add their quota to the effluvia. Several of the most populous tenant-houses along Greenwich, Washington, and their intersecting streets, are thus deficient.

SQUARES.—The squares of the district number 66, of which about a fourth, including all those lying wholly upon the elevated ground adjacent to Broadway, are in good sanitary condition, one quarter in a mixed sanitary condition. These squares are on the easterly side of Greenwich Street. They are in part located on made or reclaimed ground, and in part on dry, elevated soil, and consist partly of new, and partly of old buildings, many of which are tenant-houses, having all the worst features of their class. The remaining squares are in a bad sanitary condition, and include all those situated on the made ground west of Greenwich Street. The insalubrious condition of these squares is due to their location on ground reclaimed by "filling in" with all the loose refuse of the city. The basements are damp and badly drained, and the streets are filthy.

INHABITANTS.—The inhabitants of the district are largely of foreign birth. It would be safe to estimate that about one-half are of Irish nationality, one-quarter German, and the remainder Americans, Swedes, Danes, &c. Of the resident population, there are but few whose means enable them to live without employment of some kind. In the absence of an accurate census, we conclude that two-thirds are laborers and mechanics with their families; the balance are composed of retail shopkeepers, as grocers and dram-shop keepers, clothing merchants, shoedealers, butchers, and bakers, and keepers of hotels, sailors and emigrant boarding-houses, and brothels. There are but few of the educated and refined class, and but little ostentatious wealth. On the other hand, the general characteristics are, a medium grade of intelligence and a commendable amount of industry, intermixed largely with ignorance, depravity, pauperism, and dissipation of the most abandoned character. Quite a large element of the population here may be termed floating, consisting of travellers, emigrants, sailors, and vagabonds without a habitation and almost without a name.

An illustration of the incongruous crowding, and the perilous characteristics of a large class of the floating population that strangely mingles with the more permanent residents of this lower district of the city,

chanced to be presented upon occasion of a visit of inspection here by a member of the Council of Hygiene, last summer.

On reaching a certain squalid old tenant-house in Washington Street, that gentleman remarked: "We shall find the footprints of typhus among the residents of this rookery." Passing from apartment to apartment until we reached the upper garret, we found every place crowded with occupants, one room only $5\frac{1}{2} \times 9$ feet, and a low ceiling, containing two adults and a daughter of twelve years, and the father working as a shoemaker in the room; while in the upper garret were found a couple of dark rooms kept by haggard crones, who nightly supplied lodgings to twenty or thirty vagabonds and homeless persons. This wretched hiding-place of men, women, and girls, who in such places become daily more vicious and more wretched, had long been a hot-bed of typhus, seven of the lodgers having been sent to the fever-hospital, while permanent residents in the apartments on lower floors had become infected with the same malady, and some had died. We fully agree in the opinion then expressed by that member of the Council of Hygiene, that a Model Lodging House in the First District has become a sanitary as well as a moral necessity.

Buildings.—The buildings of this district, of which there are 1,518, present a great diversity of size, style, and character. Here are the dilapidated structures or mouldering ruins of buildings more than a hundred years old, side by side with the proudest triumphs of modern architecture. There stands the humble domicile, a single story in height, in the shadow of vast piles that tower grandly toward the heavens; old family mansions that fifty years ago were the homes of wealth and luxury, are here found in juxtaposition with those abominations of our city, modern built tenant-houses; the old family residences are themselves now frequently converted into tenant-houses.

Of strictly private residences occupied by a single family, there are but very few. Boarding-houses for sailors and emigrants, small hotels, and buildings occupied in part for business, and in part by one, two, or three families, but not enumerated as tenant-houses, are somewhat numerous. They may be estimated as constituting about one-half of the buildings marked as dwellings. This class of dwellings are mostly of considerable, and some of them of great age. They are still for the most part in a fair sanitary condition; their apartments are usually spacious and airy; their halls and passages of good width, well lighted and well ventilated. These buildings are almost never in the rear; their occupants are of a class that observe sanitary laws to a creditable extent in the care of their domiciles. There are wanting, however, some of the con-

veniences of modern construction, as, for example, they are not well supplied with water, lavatory conveniences, interior water-closets, baths, ranges, &c.

TENANT-HOUSES.—Of tenant-houses there are 241 in this district, 24 of which are rear buildings. The great majority of these houses are old family residences, many of which were once of the better class. As a rule this class of tenant-houses is in better accordance with hygienic laws than those of modern construction and originally designed as such. They have fewer and larger apartments, higher ceilings, larger dormitories, wider and better lighted and ventilated halls, stairways and passages, and their latrines, although less frequently sewered, are further removed to the rear of the domicile. There are exceptions, however, to the rule, as in cases where these old buildings have been repartitioned and cut up into numerous small-sized and ill-ventilated apartments; and where this is the case they present the very worst features of insalubrity to be found in any class.

In the construction of many modern tenant-houses, it would appear that hygienic laws and sanitary requirements have been estimated as of only secondary importance, the great problem being how to domicile the greatest number of families on a given area. And in the practical solution of that problem in this district, lies the great overshadowing cause of insalubrity, before which all others combined sink into insignificance.

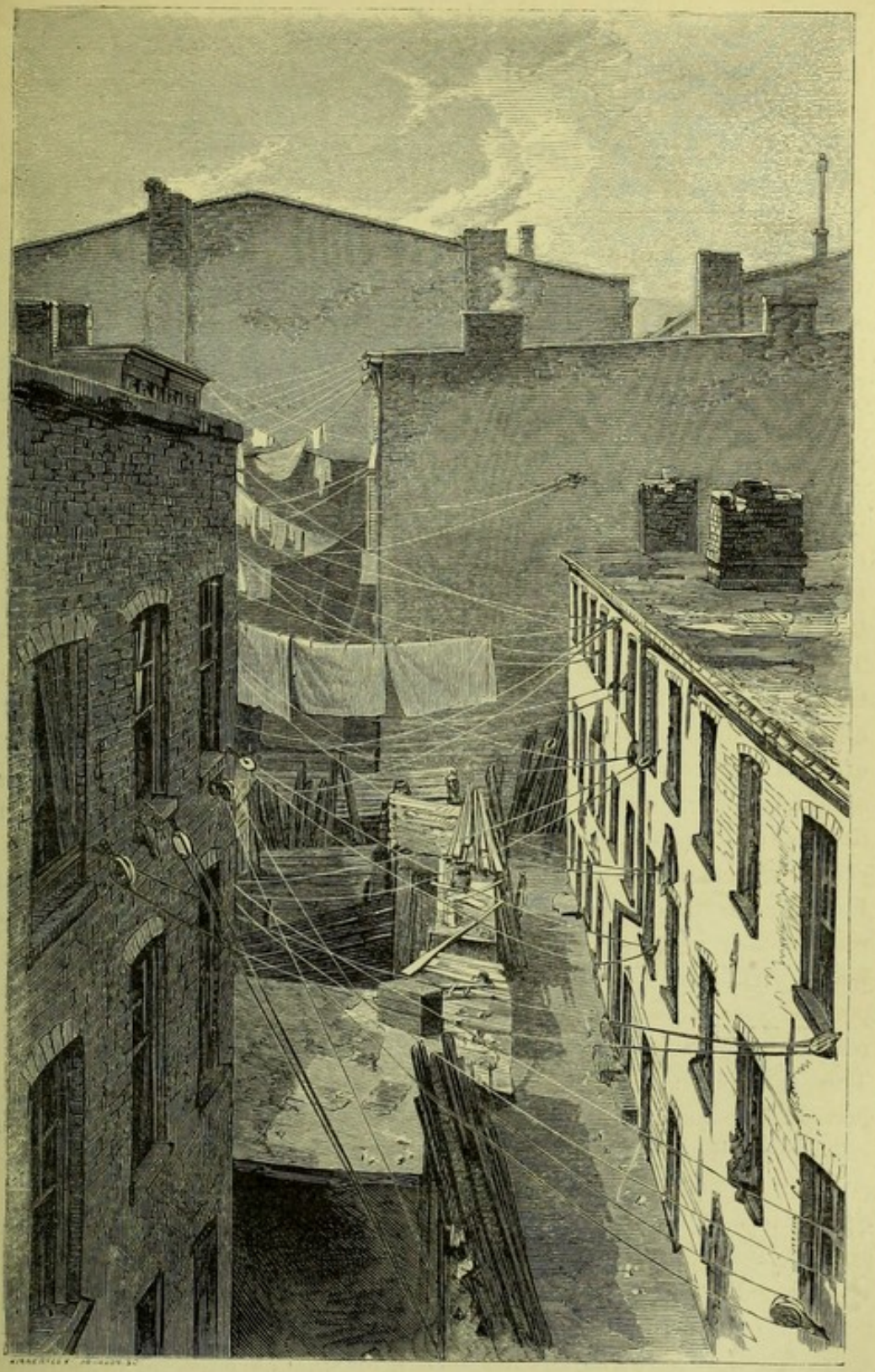
The most marked feature of the tenant-houses is the small size of their apartments, whereby ensues overcrowding in each family. The common mode of arranging them is as follows: On a lot of ordinary size, 25×100 feet, will be erected a front house 25×50, and a rear house 25×25 with a court 25×25, and frequently less, in which are usually located hydrant, cesspool, and privy. These houses are commonly five and frequently six stories in height above the basement. The principal rooms, of which there are four to each floor, occupy the width of the building, front and rear, with small bedrooms between, one to each main room. This arrangement gives accommodation to four families on each floor, making in a six-story building twenty-four families. Each family averages five members, and frequently more, as it is common for the occupants of these houses to take lodgers. In this arrangement each person has a little over 10 square feet of ground area, and 480 cubic feet of air space in the whole house. In the apartments the allowance of air space is 317 cubic feet, and in the dormitories but 89 feet to each person. This is the average, but there are many exceptions where the overcrowding far exceeds this. In addition, the facilities for ventilating these small apartments are often wholly confined to doors and windows, hall-ways and passages are dark and narrow, and the house is often surrounded by

others of greater height, shutting out the cheerful and health-giving influences of sunlight and air.

The common mode of disposing of garbage and house-slops adds still further to the insalubrious influences by which these dismal abodes are surrounded. Whether cesspools and garbage boxes are provided in the majority of tenant-houses or not, the refuse is thrown into the street, where it emits the most nauseous odors, and contaminates the atmosphere of the locality. In the rear, also, the inevitable but much-abused privy may be found, often at the very door of the house, and in nine cases out of ten in the worst condition possible. The seats and floor are covered with filth, emitting noxious gases. These "necessaries" afford from their condition no comfort, and from their location no feeling of retirement.

A marked example illustrating many of the above-mentioned features of insalubrity may be seen in Washington Street, near its lower termination, in which a row of the worst class of tenant-houses stands in rear of those of similar character, covering three ordinary-sized lots. One of the front houses is four stories in height, the other two three stories each.* The first floor of one of the latter is used as a stable; that of the other two is occupied by groggeries of the lowest class. The upper floors of all these buildings are divided into numerous tenements, most of which are small, and deficient in light and ventilation. The rear row consists of three-story buildings, uniform in size and arrangement. The first floor is two feet below the level of the court in front, and from want of proper drainage is subject to more or less flooding during heavy rains. Each floor is divided into six main rooms, with two small bedrooms in rear of each, making fifty-four apartments in the row exclusive of hallways. All these apartments are filled to their utmost capacity by the poorest class of tenement population. The space between these front and rear buildings varies from sixteen feet at one end to thirty at the other. This space is occupied by a small stable and numerous rickety sheds, privies, &c., and piles of refuse wood, boards, and broken furniture, leaving a clear space of about six feet for passage way. One of the privies stands immediately in front of the entrance of one of the rear houses, at the distance of *six feet*. The other is some twelve feet from the door of another house. This court is surrounded by the high walls of warehouses and other buildings on all sides, and is reached by two narrow passages, one at either extremity of the premises, which passages are constantly used by children and others for the purposes of a latrine. Throughout all these quarters, apartments, halls, stairways, passages, privies, court, &c., the utmost neglect of all hygienic laws prevails. And

* See engraving from a photographic picture of these premises on the next page.



A PERPETUAL FEVER-NEST.

[Engraved from a Photograph by Anthony.]

in addition, the street throughout this whole neighborhood presents habitually the vilest condition of filth, and reeks with most offensive odors. Typhus fever and measles were very prevalent here in the early part of summer, several cases of which were fatal. In my weekly reports of "pestilential diseases and insalubrious quarters," I have had frequent occasion to describe the condition of families and diseases in the premises that are here photographed. The successful work of the artist in this picture renders unnecessary any further description of these squalid and pestiferous tenements, and their noisome fronting of dilapidated and overflowing privies, and a dismal, narrow, flooded court. That eruptive fevers, typhus, and physical decay may always be seen here, is certainly not surprising.

These are some of the characteristics pertaining to tenant-houses as a class, yet there are some laudable exceptions in which exist much neatness, cleanliness, and consequent comfort and good health, and which show that much depends upon the habits of the people in the care of their domiciles, as well as upon their size and location.

The insalubrity of quarters such as those above described, may be predicated upon general hygienic principles; but that they are so in fact, is shown by a reference to the special reports "of insalubrious quarters and pestilential diseases," in which it appears that in almost all instances of such diseases tenant-houses of the worst class are their favorite haunts. It is gratifying, however, to find that at the present date there is but little disease of a pestilential character prevailing in this district; it having disappeared as the result, doubtless, of the free ventilation that the summer season enables all to enjoy, whereby typhus and other poisons become too much diluted for further propagation; and, also, to the early removal of fever patients to the hospitals. Without these beneficent and salutary agencies, those diseases would doubtless have lingered in these favorite lurking places; and as winter approached and pure air became excluded, their poisons would have again become intensified, making those populous human hives the nurseries of pestilence and the very harvest-field of Death!

But it is not in the more acute forms of disease that the poorest class of tenant-houses exhibit their worst effects upon the inmates. We find it rather in the pale and sickly countenance of their occupants, with lax fibre and general absence of robust health; we see it also in the pining and wasting of infants, and in the great prevalence of strumous, ophthalmic, and eruptive disorders. All these appearances indicate, unmistakably, the want of those great indispensable necessities of health—pure air and light. In the deadly atmosphere of some low basement, or close unventi-

lated bedroom, or in the wretched squalor of some dilapidated garret, those little ones so numerously born amongst this class first draw their breath, and in an atmosphere surcharged with poison they battle for life; but in the unequal strife very few survive, and thus are yearly sacrificed whole hecatombs of living souls. They fall, victims not of necessity, nor of the decrees of inevitable Fate, but of ignorance and avarice, and are lost to parents and friends, to society, and to usefulness in the world.

Drinking Saloons, Brothels, &c.—The drinking saloons of this district number 423. Of these about one-half are low groggeries, where the vilest of poisons are dispensed to irreclaimable inebriates; the remainder are the more respectable, but perhaps in their ultimate effects not less detrimental establishments attached to hotels, restaurants, and dining-saloons. Of brothels, which are mainly of the lowest class, there are about 40. Many of these are in underground basements along the line of Greenwich Street. There are a few houses of prostitution, of somewhat respectable exterior. Many of these establishments are frequented by large numbers of emigrant runners, bounty brokers, sporting men, and gamblers, and it is probable that gambling is carried on at most of those of a medium character. A few billiard saloons also are found, principally along Greenwich Street. It is also common along this street, and particularly at night, for large numbers of prostitutes to pursue their calling, devoid of all shame, in the public street.

Stores.—Of stores, it may be said that in some form they constitute the greatest portion of the district. Along the upper and newer portions of the same they are principally wholesale. Along Greenwich, and the lower portion of Washington, they are mostly retail shops of all kinds.

Markets.—From Cortlandt to Murray, between Greenwich Street and the river, the markets contain some variety of materials for human food, as produce and commission, provisions, wholesale groceries, fruits, vegetables, nuts, &c. The Washington is the only regular market in the district, including its offshoot West Washington Market. Meat stores are somewhat numerous, and many groceries sell most of those articles usually kept in regular markets.

The condition of Washington Market reflects discredit and positive shame upon either the city or those who are more immediately concerned in its management. It is very old and much dilapitated, its roof is leaky, and its floors warped and broken in places. It appears to be badly drained, as filthy water almost always stands in its surrounding gutters. Street filth and refuse vegetables constantly lie in the streets, and altogether it presents a picture of great untidiness. West Washington Market is also very filthy at times, so much so that it is impossible to get around it with

any degree of comfort. The vast traffic carried on in this locality may, to a certain extent, excuse the condition of things found here, but the facts are as here represented. There is but a small resident population near the market.

STABLES.—The stables of the district number 25, of which five are public, the remainder private. Many of the latter are located either in the basements or rear courts of dwellings, and are kept in a slovenly condition. These, on general principles, are sources of insalubrity, although no sickness that could unmistakably be attributed to their influence alone has been traced.

CHURCHES.—There are three churches in the district, viz.: Trinity and St. Paul's on Broadway, and St. Peter's in Barclay Street. These are spacious structures, well appointed in all respects. In addition there are two chapels of small dimensions, one at No. 27 Greenwich Street, and a floating chapel at the foot of Carlisle Street.

SCHOOLS.—There are five schools in the district. Ward school No. 29, at 97 and 99 Greenwich Street, with its Primary Department in the rear on Trinity Place. These structures are nearly new, are well provided in all respects for ventilation, warmth, and for speedy escape in case of fire. The various apartments are kept in the best of order. St. Peter's school in the basement of St. Peter's church, attended by 600 to 700 children, is not so well adapted for the purpose as the one above mentioned, but is well kept, and the health of the children good. St. Peter's Academy adjoining the church. Primary school No. 37, at 41 Robinson Street, with 150 to 200 pupils, and the "Industrial School of the Children's Aid Society," although not originally constructed for schools, are kept in a very cleanly condition, well ventilated, and comfortably warmed, and attention paid to the physical requirements of the pupils. Whatever defects there may be in our schools, their general influence is salutary, not only by the diffusion of knowledge and elevation of morality, but by their direct effects in rescuing hundreds for the time being from the degrading influences that surround them in their wretched homes; the pupils also carry back to those homes some of the genial influences of the school.

PARK.—The only park in the district is the Battery, the enlargement of which commenced several years ago, but is *still incomplete*. The walks and lawns of the older portion of it still present some show of order and neatness; but the newer portion is now occupied chiefly by barracks for soldiers and emigrants.

CASTLE GARDEN.—The hundreds of thousands of emigrants that are yearly landed at Castle Garden, are without doubt the source of consider-

able disease to the city, especially of typhus fever and small-pox. Yet this "emigrant depot" for the continent has, by its system and care, prevented much disease and suffering.

Piers.—The wharves of this district are built of wood, and are, too frequently, in a dilapidated condition. They are also the depots of vast accumulations of sewage and street-filth, which, in its decomposition, emits foul gases that pervade these districts, and render them insalubrious.

Cemeteries.—There are two cemeteries in the district, viz.: Trinity and St. Paul's; but these are now comparatively unused as places of interment.

Nuisances.—The principal nuisances are filthy streets, obstructed gutters, broken and imperfect pavements, garbage-boxes loaded with all manner of refuse, and reeking with putrescible matters, unclean stables, yards, and privies.

Diseases.—The diseases prevalent in this district the past season, have been principally typhus, measles, diarrhœa, dysentery, cholera morbus, cholera infantum, and marasmus. Typhus fever, in most cases, is imported, although there are sufficient causes to generate it in certain localities of this part of the city. Diarrhœal diseases are most prevalent in those insalubrious quarters already described, and at a season when the exciting causes are at their greatest stage of development and activity. Illustrative examples are found in Washington, Greenwich, and West Streets, and the streets intersecting them, where tenant-houses of the poorer class are located.

Improvements.—The improvements attributable to the efforts of the public authorities, consist in the removal to hospital of patients suffering from pestilential diseases. Several fever-nests have thus been broken up. There has been, also, an inspection of insalubrious quarters, resulting in numerous instances in temporary improvement; but as far as my observation extends, in the majority of these cases the improvement is only temporary, and must be so until radical changes are made in the abodes and in the habits of the large class to which these evils are chiefly confined.

Remedial Measures.—This district is rapidly undergoing a process of depopulation and transmutation, that will ultimately render it at once salubrious and almost uninhabited by families. The requirements of trade and commerce are such that probably in a very few years most of those localities now so crowded with the worst class tenant-houses, will be occupied by new and well-appointed stores and warehouses, whereby the prime cause of insalubrity being removed, the desired effect follows.

But to give a more pertinent answer to the inquiry in its practical relations: First, all streets should be supplied with sewers, and all dwellings especially should have the proper connections therewith, to insure thorough drainage, and the prompt removal of all house-slops, privy contents, &c. Streets now paved with cobble-stone pavement should be repaved with Belgian pavement, and so graded that surface drainage would be thoroughly accomplished. Sidewalks now broken up should be reflagged. The streets should be swept as often as may be necessary to keep them perfectly clean, while the prohibition of garbage, ashes, garbage-boxes, and all slops should be absolute, and should be rigidly enforced. All rear tenant-houses should be abolished, and all new tenant-houses should be constructed on an improved style, with large, airy, and well-lighted apartments, with hydrants and waste-pipes to each floor, and also conveniences for the inmates of such houses to bathe. All latrines should be well removed to the rear of the domicile, and have the proper sewer connections and hydrant attachment. In short, if the tenements of the poor could be modelled in a measure after those of their more fortunate wealthy neighbors, and provided with certain essential conveniences that pertain to the mansions of the rich, there would remain nothing more to be desired to render their quarters tolerably healthful.

Statistical Recapitulation (1*st District*).

No. of Squares,			64
" Houses,	Front, 1,484		
	Rear, 34		1,518
" Tenant-Houses,	Front, 217		
	Rear, 24		241
" Drinking Shops (all kinds),			423
" Brothels,			40
" Churches,			3
" Chapels,			2
" Schools,			5
" Stables,	Public, 5		
	Private, 20		25

REPORT

OF THE

SECOND SANITARY INSPECTION DISTRICT.

ISAAC L. MILLSPAUGH, M. D.,
Sanitary Inspector.

BOUNDARIES.—*Northerly by Park Row, Spruce and Ferry Streets and Peck Slip, east and south by the East River, and west by State Street and Broadway.*

TOPOGRAPHY.—The surface of the district presents considerable irregularity. A portion is made ground, and nearly level, including almost all that lies between Pearl Street and the East River. Westerly of Pearl Street the ground is natural, and rises gradually, though not uniformly, until it reaches its highest elevation near Broadway at Pine and Cedar Streets, and again where Ann and Spruce Streets intersect Nassau Street and Park Row. The line of Broad Street exhibits a marked depression, and was, as appears from old maps of the city, once a water course. Maiden Lane also exhibits a marked depression of surface that was probably once flanked by hills of considerable height, but which have been removed, furnishing material for filling in the low ground east of Pearl Street. At the upper limit of the district, on Ferry Street, in the vicinity of what was once the "Swamp," is also a considerable stretch of low ground, once a marsh, reclaimed by filling in with the superfluous materials of the elevated portions. The soil of the district is a sandy alluvium, and therefore favorable to thorough drainage. The unevenness of the surface also contributes to good drainage of the streets and to a free flow of sewage. The level portion of the district east of Pearl Street has, however, the disadvantage of but slight elevation above tide-water, and insufficient inclination for thorough drainage. As a consequence, accumulations of surface materials occur in streets and gutters, and underground apartments are damp.

STREETS.—The streets of the Second District vary much in width and direction; some are of great width, as Broad Street and the Slips along the East River; but the majority are narrow, and several are so contracted as scarcely to allow of the passage of a single vehicle. Most of the streets have the cobble-stone pavement. The exceptions are Park Row, paved with Russ, and much improved by grooving; Beekman, Fulton, Wall, Beaver, Whitehall, State, and South Streets, and portions of Pearl, William, and Pine Streets, which are paved with Belgian pavement. This kind of pavement is peculiarly well adapted to this district on account of the great amount of heavy carting necessary in the transactions of its commercial business. The cobble-stone pavement is especially faulty in this district. The streets paved with it are uneven, and are always unclean owing to the accumulations of refuse.

SEWERAGE.—There are but few streets in the district that are not in whole or in part sewered. These sewers empty into the river between high and low water. There is a considerable number of dwellings in the district that have no sewer connections.

SQUARES.—There are 99 squares in the district, the larger number of which are not in a bad sanitary condition. They are located upon a dry, sandy soil, well drained, and with sewers in all the surrounding streets. The remaining squares are upon made ground, and have the usual disadvantages of squares thus located. The squares on either side of Whitehall Street, and three or four at the upper extremity of the district, may be regarded as in a *mixed* sanitary condition, not so much on account of their location, drainage, &c., as because their inhabitants neglect all sanitary precautions.

INHABITANTS.—This district is the least densely populated section of the lower part of the city, and its permanent inhabitants are decreasing from year to year. Old dwellings are constantly giving place to large and costly structures erected for commercial purposes. The Irish nationality predominates. About one-half the resident population is of the laboring class; the remainder is principally composed of keepers of hotels, saloons, boarding-houses, &c. One-half may be estimated as ignorant, the other half of a medium grade of intelligence.

BUILDINGS.—The buildings of the district number 2,309. Of these 31 are rear buildings; 73 tenant-houses, none of which are rear buildings; an equal number are dwellings containing one or two families not enumerated as tenant-houses, nor are they strictly private residences. There are very few private residences. The great majority of buildings in the district are stores and warehouses. In the lower section they are principally devoted to the grain, flour, and provision trade; along the

river and in its more immediate vicinity shipping-offices and supply stores predominate; through the more central portions a great variety of business is transacted, mostly on a large scale.

Sanitary Wants of Commercial Warehouses and Offices.—Of the nearly two thousand buildings that are devoted to mercantile and business purposes in this district, only a small minority have adequate ventilation and lighting in their counting-rooms and most frequented apartments. Although it is noticeable that vast improvements in these particulars are effected in most of the more recently-erected stores and offices, there is an imperative hygienic demand for reform in this respect in the older buildings. We know it is safe to say that hundreds and probably thousands of valuable lives are sacrificed every year in the counting-rooms, banking-houses, stores, and offices of the commercial district of our city in consequence of defective ventilation and natural lighting; and that the health of a hundred thousand business men and their employés suffers seriously from the same causes. In this district, so densely crowded with high buildings, and with its narrow and almost sunless streets thronged by a hundred thousand persons through the day, it is also a matter of prime importance that every nuisance and offence against health be kept abated, that the streets, alleys, gutters, sinks, privies, cellars, and docks be kept scrupulously clean, and that special regard be had to the sewerage, and its trappings against reflux gases, and that all other sources of insalubrious emanations be strictly controlled. In the attic story of many of the banking and other buildings reside the families of the person in charge of the various offices. The sanitary condition under which these families reside is generally favorable.

Manufacturing operations of various kinds are carried on throughout the district. There are 290 drinking establishments, some of which are groggeries of the lowest class, while the majority are bars of hotels, dining saloons, and restaurants.

There are two principal markets, viz., Franklin and Fulton, and meat shops at the lower end of the district. Franklin Market is old and has a comparatively small trade, principally with the shipping. Fulton Market is the centre of an extensive business as a family market. It is situated on made land, with defective ground and surface drainage; the buildings are old wooden structures in a dilapidated condition; the stalls are small, poorly ventilated, and offensive with the refuse accumulated in and under the worn-out floors; the gutters in and around the market are generally obstructed with filth: in a word, the whole establishment in its internal arrangements and condition, and its external appearance and surroundings, is a disgrace to a civilized community. There are 16 *stables* in the district, but two of

which are public, many of these are situated in the yards of tenant-houses or in buildings whose upper rooms are occupied by families. Neglect is apparent in the case of many of these establishments, and filth is allowed to accumulate around them.

CHURCHES, SCHOOLS, &c.—There are three churches in the district, viz., St. George's Chapel, at the corner of Beekman and Cliff Streets; the North Dutch Church, corner of Fulton and William Streets, and the First Methodist, in John Street. These churches are all old structures. There are two schools, both primary. One of these is a brick three-story and basement building, and is attended by 150 children. The three apartments occupied as assembly and recitation-rooms, are warmed by wood fires in stoves, and ventilated by doors and window-sashes. The other school is attended by from 150 to 200 children. None of these edifices are adequately ventilated.

DISEASES.—Owing to the sparseness of the population, there is at no time a great amount of sickness in the district. In a few localities, however, there has been some typhus fever, traceable in most instances to immigrants newly arrived. It made its appearance in tenant-houses, and in two or three instances spread through all the families immediately exposed. At one place in Bridge Street, adjoining the Battery, the disease attacked successively every member of the family immediately exposed, but was prevented from spreading further by free ventilation, the character and location of the domicile permitting that agency to be employed. In another case, in a low, damp basement in Pearl Street, it was arrested by removing the sick to hospital. Some cases of measles were observed in the district during the early part of the summer.

REMEDIAL MEASURES.—The preventible causes of sickness among the resident population are here limited to tenant-houses. Though there are but few large tenant-houses constructed for that especial purpose in the district, there are many small and old tenant-houses. The buildings are old and more or less dilapidated; the apartments are filthy; the halls, passages, and stairways abound with dirt, and the yards, often unpaved, are the receptacles of house sweepings, ashes, and excrement. Their privies are unsewered, broken, overfull, and utterly unfit for their proper use, while the gutters of the adjacent streets are filled with the most noxious compounds of house-slops, garbage, and ordinary street dirt. Within and around such wretched habitations a pure, invigorating atmosphere cannot exist, and their occupants are alike strangers to physical robustness and moral purity.

The most obvious necessity is the erection of tenant-houses, of improved style and arrangement, whereby larger apartments, more light, and

better ventilation shall be afforded; water upon each floor, with proper drain, and ample lavatory conveniences would be secured. Water-closets, located well apart from inhabited quarters, should be provided with sewer connections and hydrant attachment, so as to prevent accumulation. Where the want of rear space—as so frequently happens in this section of the city—prevents such remote location of water-closets, the most eligible position is underneath the sidewalk, at once secluded, sufficiently convenient of access and of easy sewer connection.

In the disposal of garbage and house-slops there should be a total abolition of street garbage-boxes, and a strict prohibition of the present universal custom in this part of the city, of throwing slops into the street.

The streets should be more thoroughly sewered, and those that are badly sewered should be improved by the substitution of sewers of the most approved style. Cobble-stone pavement should also be replaced by the trap-block, or Belgian. Finally, we would suggest that the Council of Hygiene cause a suitable pamphlet or report to be prepared with reference to the hygienic requirements of counting-rooms and offices connected with the mercantile houses of the crowded sections of the city. The commercial classes and the tens of thousands who daily frequent this commercial and shipping district, might properly unite in requesting the owners of mercantile edifices to improve the lighting and ventilation of their offices, etc.; and the same persons, together with multitudes of business men in all parts of the country who frequently visit and do business in this section of our city, should also join in demanding that its streets, its docks, and its sewers, shall be kept in so cleanly a condition, that the health of the vast population that is daily exposed to emanations therefrom, shall no longer be imperilled by them. Though "Commerce is King" in this particular section of the city, the fact should be kept in mind, that civic salubrity is one of the indispensable safeguards to commercial prosperity.

Statistical Recapitulation (*2d District*).

No. of	Squares,	99
"	Houses,	2,309
"	Rear Houses,	31
"	Tenant-Houses,	73
"	Dram-shops (all kinds),	286
"	Stables (mostly private),	16
"	Churches,	3
"	Schools,	2

REPORT

OF THE

THIRD SANITARY INSPECTION DISTRICT. [SECTION A.]

HAMPTON HARRIOT, M. D.,
Sanitary Inspector.

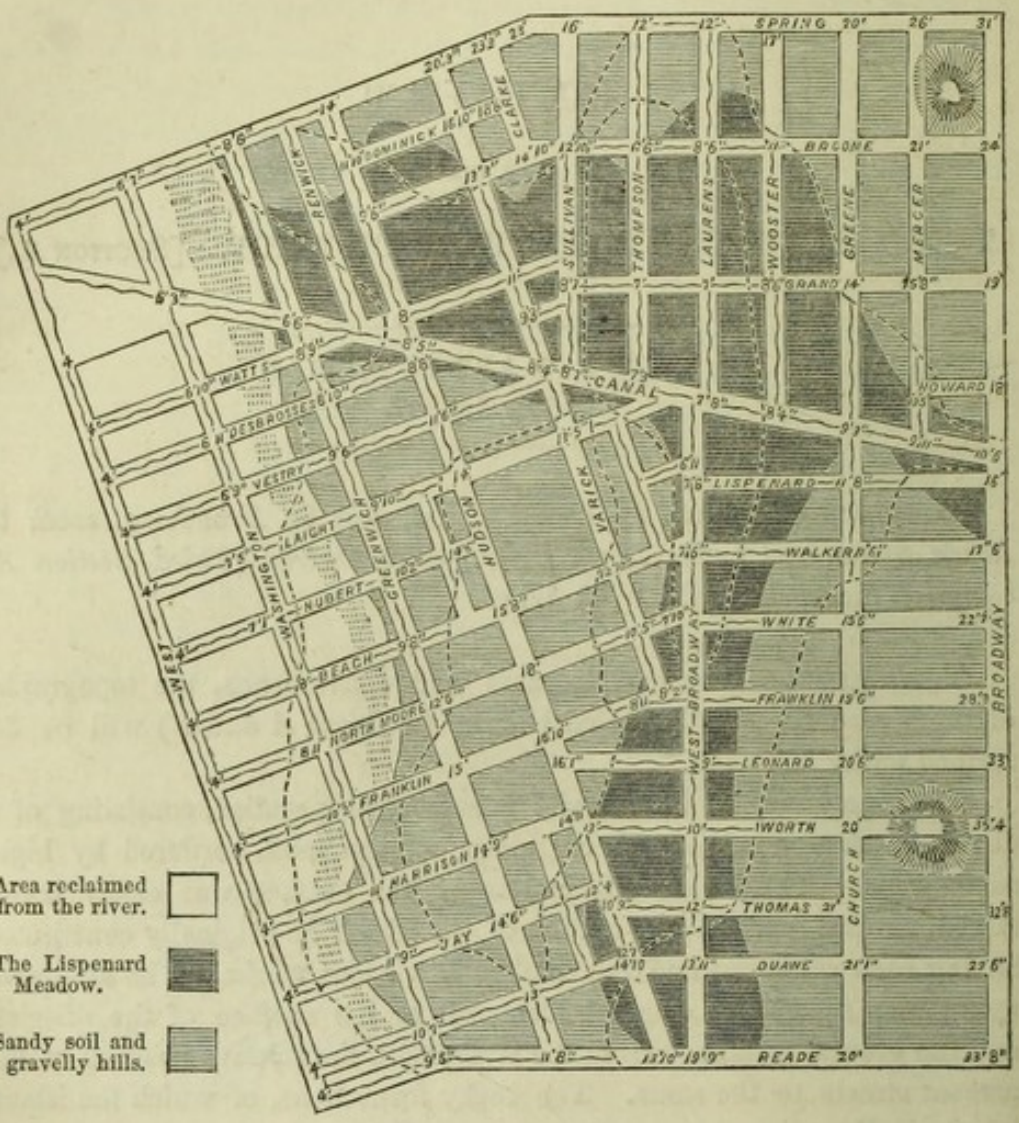
BOUNDARIES.—*North by Canal Street, east by Broadway, south by Reade Street, west by the North River. This District (Third, Section A) comprises the whole of the Fifth Ward.*

TOPOGRAPHY.—For completeness and convenience, the topography of the entire area of the Third District (*Sections A and B*) will be described under one head.

The topography of this district is somewhat peculiar, consisting of a depressed section of ground, originally swamp land, bordered by high, sandy hills. The original formation of the surface was easily ascertained, several maps of that section of the island as originally constituted having been preserved and republished in various works. The accompanying map shows the original formation of the surface of the district, and the ground reclaimed from the river, with the relative position of the present streets to the same. The rocky formations, of which the island is principally composed, are here depressed to a depth of from forty to eighty feet below the surface, thus forming a basin, which, where not occupied by high sand-hills, formed deep depressions, filled with more or less soft quagmire. These swamps were indeed so unsubstantial in places as to yield under the weight of the dirt dumped in to make firm ground for building purposes; necessitating, in some places, the making of new ground to the depth of forty feet. This was ascertained to be the depth of made ground before reaching the remains of the original deposit of mud, at the corner of Wooster and Grand Streets, where a well was sunk some years ago, an additional depth of thirty feet of the original deposits being passed through before the rock was reached.

SANITARY AND TOPOGRAPHICAL MAP OF THE THIRD INSPECTION DISTRICT.

THE FIFTH, AND A PART OF THE EIGHTH WARD.



EXPLANATION OF FIGURES, ETC.

The numbers at the intersections of the streets indicate the present elevation at those points above tide level.

The wavy line in streets and sections of streets indicates sewers into which the high-tide water flows.

The dotted contour line ~~~~~ indicates the line of demarcation between the section that is drained by sewers through which tide-water flows, and that section of the district in which the bottoms of the sewers are above tide-level.

The crests of the highest of the original hills are shown upon the right-hand margin of the Map.

On the map the part unshaded represents the ground reclaimed from the river, being the greater part of the district outside of Greenwich Street. The surface represented in the marshy shading shows the extent of swampy ground, formerly called the Lispenard Meadows. This ground was very soft and boggy in its nature, being overflowed by water at high tides, and until filled in it was almost impassable. The amount of material required to fill in this swamp, and the enormous expense attending it, induced the authorities of that day to make the grade as low as possible, consistent with mere surface drainage. Portions of it have since been filled in and other parts will probably be soon raised in grade, thereby improving the drainage; but yet leaving a very large surface of low and badly-drained ground, especially near and north of Canal Street.

This swampy land was intersected by a sluggish stream of water, running from the pond, called the Collect, situated in the present neighborhood of Centre and Leonard Streets, and covering several squares of ground. This outlet followed nearly the line of Canal Street from Broadway, where it was crossed by a stone bridge, to the Hudson River, emptying therein. A branch of this stream on the line of West Broadway, drained the meadows in that direction.

The shaded portion of the map represents the solid ground, which was formerly somewhat irregular and picturesque in appearance, being high and hilly, rising on Broadway and Leonard Street to a height of near one hundred feet above the river. These high grounds have since been much lowered by grading down for building purposes; and the surplus dirt was used for filling in the swamp lands and the section reclaimed from the river. Part of one of the original hills can yet be seen in the grounds of the New York Hospital, which have not yet been reduced to the street grade. The hill that existed in the neighborhood of Broadway and Broome Street was also so high as to be cut down some forty or fifty feet, being below the bottom of some of the wells in the vicinity. The tongue of land between the Lispenard Meadows and the Hudson River was of less elevation, but was also more or less disturbed by the necessary grading of that part of the city.

Drainage and Sewerage.—The original sewerage of this district had a direct relation to the natural formations of the surface. As the meadows were filled in the original streams were carried through open box sewers, built of timber, following the lines of Canal Street and West Broadway. In the course of time, and from the growth of the city around them, these sewers became so offensive and dangerous that it became necessary to enclose them. This was done by building very large sewers, with comparatively flat bottoms, which remain to this day a continual

source of expense and nuisance. The bottoms of these sewers were laid with flat stones sloping to the centre; the sides were built of brick, perpendicular in direction, and some four feet in height; and from these side walls a low arch was thrown enclosing the sewer; the whole being covered with the street and pavement. Owing to this plan of building, the bottoms of these sewers are badly broken and cannot be thoroughly cleaned. All the other sewers of the district are built of brick or tile, being oval in shape and well adapted to their purpose; some of the smaller branch sewers being of earthen ware, moulded and burnt in sections. The district is pretty well sewered, and the streets needing it are being rapidly supplied.

Street Elevations.—On the map I have given in numbers the elevation, in feet, of each street intersection above high-water mark, and have also indicated by wavy lines such streets in which the sewers, if built, would be entered by the tide at high water. This has, from the nature of the case, been arrived at by estimating the depth of the bottom of the sewer from the level of the surface of the street. Officers of the Croton Aqueduct Department, to whom I am indebted for much of the information contained in this portion of my report, inform me that my calculations are nearly correct. They informed me that in all cases where possible the bottom of each sewer is laid at a depth of thirteen feet below the level of the street. To this there are two exceptions: First. To drain a basin lying behind a ridge of land, it sometimes becomes necessary to build a sewer at a greater depth through the intervening ridge. Second. On approaching the rivers, and where the ground lies too low, as in a large part of the Third District, the sewer cannot be built at so great a depth. I have taken the estimate of thirteen feet as the proper depth of the bottom of the sewers, and have represented all the sewers in the streets having a less elevation above high water-mark, as being reached by the river water at high tide. When the river is above this level, it is well known that several of these sewers are entirely full of water, and unable to carry off the surface water in case of heavy rains; and consequently the streets and cellars in such localities are frequently overflowed. On several of these streets it has for the same reason been necessary to place traps, &c., on the sewer connections to prevent the flow of water back into the houses or cellars. By referring to the map it will be seen that tide-water runs up the sewer in Canal Street as far as Broadway, spreading north through Thompson and Laurens Streets as far as Spring Street, and through the other streets to a somewhat less extent; also running south through West Broadway as far as Thomas Street, there meeting the tide coming directly from the river. Adding to these facts the flow of tide-water into the

branch sewers, and in all the sewers within two to four squares of the river, it will be seen that *two-thirds of the sewer surface of this district is reached by salt water*. All the sewers of the Third District empty into the slips between the wharfs along the North River, with the single exception of the Canal Street sewer and its connections, which empty at the head of the long pier at the foot of Canal Street, and in deep water. This system of emptying the sewage into the slips is a prolific source of offence to the senses and of disease to the district, and also keeps the city at continual and great expense for the necessary dredging to keep them navigable and prevent their filling up. The Croton Aqueduct Department, however, is desirous of correcting this, by building sewers along the river front, to cut off the present sewers, and carry their discharge to certain points, as at the Battery, &c., where their contents can be at once thrown into free currents of deep water, thus avoiding these difficulties. This system regards the sewage as of no value, but the time will probably soon arrive when some plan will be desirable to save it and make it valuable.

Influence of Topographical Characteristics of this District on Health.—The influence of the peculiar formation of this district upon the public health has been marked. Those portions reclaimed from the swamp and river being undesirable for a good class of population have been consequently built upon by an inferior class of buildings, and occupied by people too ignorant or indifferent as to consequences to seek to avoid them. The observations of physicians and sanitary officers, however, have shown that such sections of the city are, in case of epidemic diseases, *always the first to be attacked*, and that they invariably present the greater number and more severe class of cases. During the various epidemics of fevers, cholera, influenza, &c., that have visited this city, these sections have furnished a very large proportion of the patients, and a still larger proportion of the fatal cases. During the recent and present prevalence of typhus and typhoid fevers, I have noticed that the number and severity of cases have borne a direct relation to the *nature of the ground upon which they occurred*. Our hygrometers, which have been in constant use in the worst sections of this district, indicate more than twice the amount of moisture in the atmosphere given by the standard instrument kept at the Eastern Dispensary. Such diseases as cholera infantum, fevers, &c., especially of children, always prevail most extensively in such moist localities, not to speak of rheumatism, scrofula, and pulmonary diseases, which are generally recognized as being specially dependent upon exposure to cold and wet.

STREETS.—The streets of the Third District are laid out, more or less, at right angles with each other—running north and south, or east and

west. They vary in width from forty to eighty feet, except Canal Street, which is much wider. The greater number of the streets are paved with cobble stones; and, at the time of this survey, were found in pretty good repair, except West Street and its immediate neighborhood, which is considerably lower than the proper grade, and is in very bad order. Those sections of the different streets, however, where there are tenant-houses, are always wet and filthy from garbage and slops that are thrown into the street. Broadway, Washington, Greenwich, and Worth Streets, in their full length, in this district, have been repaved with the trap-block pavement; and portions of Desbrosses, Reade, Duane, North Moore, and Jay Streets, have been similarly paved. It is to be hoped that this kind of pavement will, as soon as possible, replace the cobble-stone pavement, as it has proved to be not only by far the most durable, but it is much more easily kept clean, and does not accumulate in the interstices such a quantity of the foul matters of the streets. The connection of civic cleanliness with civic health is too evident to be questioned at this day. Under my own observation in this district,* the widening and repaving of various streets have been followed by the most marked improvement in the health of not only those streets, but of the whole immediate neighborhood. It is true that the population of this section was greatly diminished by these improvements, but those that remained have not shown half the proportional amount of sickness, although of a class more subject to disease than the original residents.

Squares.—The number of squares in the Third District is 74. Of these 32 are in a good, 25 in a mixed, and 17 in a *bad* condition, as regards sanitary considerations. I report as *bad* those squares in which, from the character of the soil, buildings, and population, more than the average amount of disease prevails. Those squares are regarded as mixed in which the same causes prevail to a partial extent, or where, from the encroachments of business property, or from other causes, the population is mostly removed. All others are regarded as being in a good sanitary state.

Inhabitants.—The population of the Third District has undergone, and is now undergoing, great and rapid changes. Originally settled by a native-born population, the greater numbers of residents are now of foreign birth, or children of foreign parentage. The colored population, formerly so numerous in the Fifth Ward, has almost disappeared, a few scattered tenant-buildings—not more than twenty-five in number—containing all that are left. The large number of houses of prostitution west of Broadway, for which this district was, not long ago, so notorious,

* The Inspector has been sixteen years connected with the New York Dispensary, and daily engaged in professional duty in this part of the city.—Editor.

is also rapidly disappearing from this section of the city, their former inhabitants being replaced by foreigners, and they, again, being soon crowded out by the encroachments of mercantile business.

TENANT-HOUSES.—Nearly all the houses remaining in the district have been altered for tenant-houses, or are now occupied as boarding-houses, or for business purposes. Large tenant-houses, which accommodate more than six or eight families each, are comparatively scarce, there only being about forty of such character. All others reported as tenant-houses, are small in size, the greater number being altered from private residences, or occupied by several families, without alteration. Most of the large tenant-houses are located in the neighborhood of West Broadway, from Leonard to Thomas Streets, or near Greenwich Street; the others being scattered throughout the district.

I have reported 450 houses as being tenant-houses; being such houses as contained three or more families. With the exceptions noted, these were formerly occupied as private residences, or by two or three families; but, with the changes of population, the greater number of them have been filled with as many families as there are rooms to accommodate them, many of the families having no other sleeping-apartment than that occupied as the kitchen and living-room. In some of these houses the Croton-water and waste-pipes have been introduced, but in most of them the Croton-water is introduced only to the court-yard, or area. In other respects these houses remain as built long ago for private families. As a consequence, ventilation is very imperfect, from the doors between rooms being always closed; water-closets are too few in number, and filthy, from being used by so many persons; and the houses become more and more dilapidated, until many of them, in the neighborhoods where business is encroaching, are in part or entirely unfit for human habitation.

NUMBER AND CLASSIFICATION OF THE HOUSES.—Including the 450 noted as tenant-houses, there are 1,244 dwelling-houses in the district, 95 of them being rear buildings. The larger number of those not noted as tenant-houses are occupied for boarding-houses, there being comparatively few which can properly be reported as private houses. Many of the objections relating to tenant-houses also apply to the boarding-houses, except that the latter are kept in a more cleanly condition. Still, they are necessarily overcrowded and deficient in most of the accommodations needed for a perfect state of health in the occupants.

There are also many buildings occupied for stores, offices, &c., in which a family is living who take charge of the building, keep the passages clean, &c., which I have not reported as dwelling-houses. There are also several buildings occupied by fire companies, in which some of the

members always lodge, which are not included as dwellings. The actual number of the population of the district I made no effort to ascertain, as the time allowed was too limited, and I had none of the necessary facilities for such investigation. The figures given in the last United States Census would be very incorrect, as the changes produced since that was taken, by the encroachments of business property, &c., have been very rapid and extensive. There is no doubt, however, that the average number of inhabitants to each house would be high, as would be expected from my statements in regard to the character of the population. From the same reasons, no investigation has been made in regard to the number of people occupying basements and cellars—a subject needing investigation, and which would repay full and careful inquiry.

Liquor Stores.—There are 341 places in the Third District in which liquor is retailed, including groceries, restaurants, and hotels and dram-shops. This is a very large number in proportion to the population, being one to less than four (1 to 3·65) dwellings. However, it must be remembered that, owing to the situation of the district, large numbers of their patrons are from outside the district. Thus a great many of the liquor-saloons are located along or near the river, and are almost entirely supported by boatmen and persons employed along the docks, &c.; many other saloons are located on the line of Broadway, Canal Street, and other thoroughfares, which derive a large support from the transient population and persons employed in the stores in the neighborhood.

Brothels.—I report 81 as the number of buildings occupied exclusively as houses of prostitution in this district. This number is probably below the truth, from the difficulty of ascertaining, with the means at my disposal, which houses were thus occupied. I have also not included in the number a large number of houses occupied only in part for such purposes. It is a well-known fact that in many of the tenant-houses of this district such persons occupy suites of apartments interspersed with those of the respectable laboring-classes, and frequently difficult to be distinguished from them, except upon a more searching investigation than this survey could give. During the last few years, a large proportion of the more notorious brothels have been removed from this district to the upper parts of the city, the houses being now occupied by the laboring-classes, or for business purposes.

Stores and Commercial Warehouses.—There are 283 buildings in this district occupied exclusively for commercial purposes. There are also 294 small stores, of various kinds, occupying parts of buildings. Of these 29 are meat and vegetable markets exclusively, there being no large market-building in the district; although Clinton Market, at the foot of

Canal Street, is just north of this southern section (A) of the Third District, and Washington Market, at the foot of Fulton Street, is not far removed, both of them being largely patronized by the residents of this district. There are also 87 groceries, of which nearly all sell liquor, and many deal in meat and vegetables.

Factories.—There are 151 manufactories and workshops of various kinds in the district, many of them occupying only parts of buildings, used otherwise for trade or residences.

Of these 6 are sugar-refineries, &c.; 11 boiler and machine shops; 26 carpenters, joiners, and box manufactories; 2 large coffee and spice mills; 2 distilleries; 1 brewery; 3 oil and lard works; 12 blacksmith and wheelwright shops; 2 tobacco and snuff manufactories; 5 smoking and provision establishments; 14 artificial flower, feather, and leaf manufactories; and the remaining 67 are manufactories of various kinds, too numerous to be particularized.

Stables.—There are 108 stables, or ranges of single-stall stables, in this district. Of these 68 contain each less than 5 horses, or 202 horses in the aggregate; and 40 contain each 5 or more horses, or 383 in the aggregate. These stables are scattered pretty generally over the district, there being few squares without one or more of them. There are certain neighborhoods, however, which contain a large number upon a small area. Such is the neighborhood of Greenwich Street from Desbrosses to Vestry Streets, where 3 squares contain 16 ranges of stables, accommodating 117 horses. Also, in the neighborhood of West Broadway from Beach to Worth Streets, where 6 squares contain 19 stables, with 163 horses. Most of the larger stables are kept in a quite cleanly and comfortable condition, but the greater number of small stables are crowded together, and their surroundings are frequently neglected and uncleanly. In regard to the influence of stables upon the public health, I think that I have, in many cases, traced to their influence (especially when occupied by sick and disabled horses) an earlier invasion and increased prevalence of such diseases as scarlatina and diphtheria. However, further investigation and much more extended observation over a larger field, is necessary to decisively settle this point.

Nuisances.—There are no slaughter houses, gas manufactories, or bone and fat-boiling establishments in or near the immediate neighborhood of this district, in any manner or degree influencing its health. Such causes as do produce such influence *are connected with the topography, character of the population, and condition of the piers, slips, and sewers*, which we have already noted.

Public Buildings.—Of public buildings there are but few. There is one Police Station-house on Leonard Street, badly arranged for the

health of its occupants, both as regards its own internal arrangements and its immediate surroundings. There is a large hospital with several buildings, known as the New York Hospital, on the square bounded by Broadway, Worth, Church, and Duane Streets. These buildings are finely situated, both as regards the location of the ground and their internal arrangements for the comfort and health of the inmates. A detailed report is unnecessary in this place. There are only two church edifices in this district; both front on St. John's Park, and both are well located for light and ventilation. There are also two Mission Churches occupying lofts of buildings otherwise used for business purposes; and a floating chapel for seamen and others at the foot of Laight Street. As regards School Buildings, there is one large Ward School on North Moore and Varick Streets, with an extension running through to West Broadway. This school is of the first class, accommodating nearly two thousand pupils. There are two Public Primary Schools, one occupying a building erected for that purpose on Greenwich Street between Desbrosses and Watts Streets; the other occupying a building altered from a private residence in Varick Street near Canal. Both these buildings are badly arranged for ventilation and light, having windows, &c., only on front and rear. There is one Primary School for colored children on Franklin Street, between West Broadway and Hudson Street, occupying a small two-story building erected for a dwelling-house, and necessarily badly arranged and ventilated for such a purpose. St. John's Episcopal Church has also connected with it a Parish School, occupying a building in the rear of the church. Two Mission and Industrial Schools occupying lofts of stores, badly arranged but occupied only on certain days, complete the list of free schools in the district. There are 19 Hotels in the district, varying in size and capable of accommodating from 25 to 250 lodgers each at one time. Many of these being altered from private houses are badly ventilated and miserably arranged for hotel purposes.

Parks.—The Third District cannot be said to have any public parks. St. John's Park, bounded by Hudson, Laight, Varick, and Beach Streets, is a private square not belonging to the city, and kept closed to all except the occupants of the surrounding houses, &c. This park, however, in connection with the grounds surrounding St. John's Church, and those belonging to the New York Hospital, are kept in the cleanest and best manner, and are valuable breathing spots for this section of the city.

Piers and Slips.—The piers, wharves, &c., fronting the Third District, are generally in a dilapidated and neglected condition, though a few occupied by steamship lines are kept in very good order, being enclosed with sheds and gateways. All the piers, however, being built of

wood, necessarily furnish a large amount of decaying vegetable matter, which is known to be a prolific source of disease. The slips, in consequence of receiving the sewage of the district and surrounding parts of the city, are generally foul, and the undoubted source of much sickness. I have seen a number of cases of severe disease, such as fevers, congestions of the brain, liver, &c., induced by bathing or getting overboard in the slips of this district.

Prevailing Diseases.—The prevailing diseases of the Third District during the past year have been as follows: Small-pox has prevailed more extensively than for many years back. One centre of this disease was in the neighborhood of West Broadway, Thomas, and Leonard Streets; and another centre at Greenwich, Watts, and Desbrosses Streets; with scattering cases over the whole western part of the district. Typhus and typhoid fevers have been prevalent over the whole district, but more particularly in the neighborhood of the lower half of West Broadway, and between Greenwich Street and the Hudson River. The remitting fever of children has been as usual almost universal in the tenant-houses of the district, more especially during the Spring and Fall. Diarrhœal diseases, including cholera morbus, &c., commenced early in the season in the immediate neighborhood of the Hudson River, gradually spreading thence over the whole district. These diseases affected nearly every house and family coming under my observation as Visiting Physician for the New York Dispensary. This curious fact of this class of disease, commencing on the western border of the city and thence gradually spreading toward the eastern side, has been noticed in other parts of the city. Scarlatina, erysipelas, and kindred diseases, were prevalent early in the season, but disappeared as warm weather advanced. These diseases were more or less prevalent in tenant-houses in proportion to the crowding of their population, cleanliness, &c. The amount of sickness in different houses of the same neighborhood is very various, in some cases being not more than twenty per cent., and in others reaching as high as two hundred per cent. per annum. It is difficult to account for this on a superficial examination, but the character, occupation, temperance, cleanliness, &c., of the inhabitants of neighboring houses vary greatly, and are a pretty close indication of the amount and kind of prevailing sickness to be found in any particular house. Different houses vary greatly also as to their facilities for ventilation; the number of inhabitants in basements and on first floors; the location and care of water-closets, sinks, cesspools, &c.; their connection with smoking and provision establishments, and other kinds of business locations; the width, cleanliness, and kind of pavement in the streets; the proximity of the

river; the character of material and state of repair of the building itself and its accessories; the arrangement of the rooms, bedrooms, and halls; and various other causes of interference with health. A thorough investigation into all such particulars would be necessary to arrive at any just or valuable conclusions in regard to the causes of disease and death. A large number of such searching investigations have been made and are now making under the direction of the Council of Hygiene and Public Health of the New York Citizens' Association, and cannot fail to give valuable results when fully tabulated and compared.*

* The Map or diagram on opposite page has been prepared to illustrate, more distinctly than could be done by words, the intimate connection of one of the small-pox and typhus fever centres of the Third District with the wholesale dry goods section of New York City. The largest wholesale establishments for the sale of dry goods on this side of the Atlantic Ocean are here seen to come in immediate contact with the tenant-houses of the worst class, and which are infested with small-pox and typhus fever. The diagram also shows that two freight depots and the principal passenger depot of the Hudson River Railroad Company are in the same close association with these nests of infection. In the region immediately surrounding that represented on the map are also situated several hotels, and a large number of boarding-houses, whose inmates are thus in danger of personal contact with these diseases at any moment.

West Broadway, running through the very centre of the district, is traversed by five different lines of city railway cars, with an average of five cars passing every minute, and carrying millions of passengers yearly by the very doors of these houses. Broadway, at but a short distance removed, is the principal thoroughfare of the city. Hudson Street on the west is also a leading route for city travel; and the cross streets of the district are traversed daily by multitudes to reach various lines of steamboats, cars, and steamships, which leave the city opposite this point.

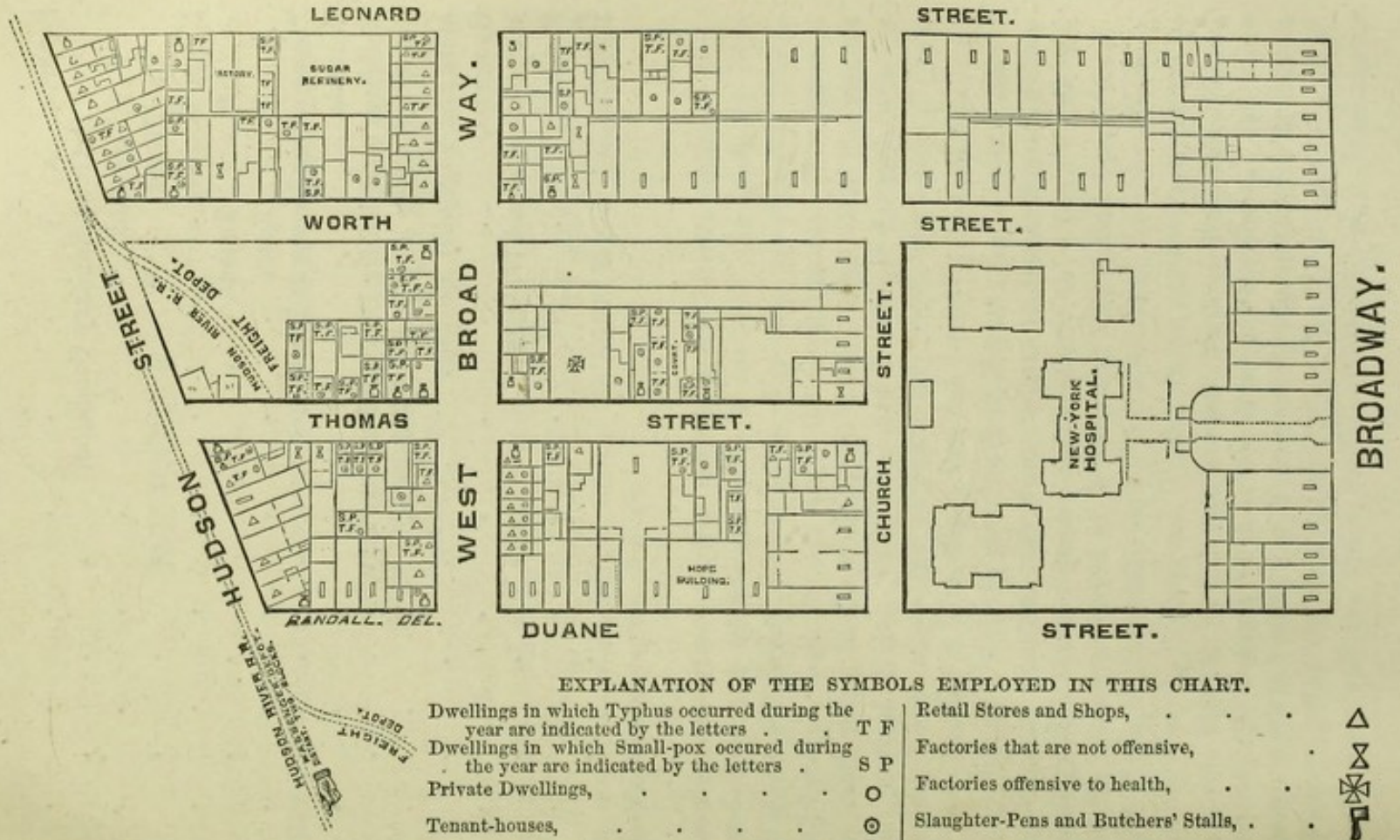
All this large amount of daily travel passes through a region always containing cases of typhus fever, and largely infected with small-pox. Is it any cause of surprise that cases of these diseases are here contracted, to be carried to distant sections of the country, there to develop themselves to the surprise and alarm of whole neighborhoods? It is also well to remember that several large livery stables are located in the immediate neighborhood, whose vehicles it is well known are frequently employed to carry persons suffering from these diseases to hospital, or to attend at funerals. These vehicles are, perhaps, immediately afterwards driven to the various car and steamboat lines to secure passengers, who are thus exposed in the most dangerous manner to these diseases. Could the intelligent community but realize the danger to which they are thus exposed whenever they visit the city, certainly they would insist that some measures should be taken for their safety and that of the large section of the country under the immediate influence of this city. It seems certain at present that the residents of the city cannot or will not protect themselves. The map illustrates the prevalence of these diseases for only one year, from November 1st, 1863, to November 1st, 1864.*

---

* For explanation of the *symbols* employed to designate the purposes for which each building in the squares is at present occupied, see remarks at bottom of the diagram.—EDITOR.

A REGION OF TYPHUS AND SMALL-POX.

[At the time the Sanitary Survey was commenced, this region was infected with diseases as here indicated.]



EXPLANATION OF THE SYMBOLS EMPLOYED IN THIS CHART.

Dwellings in which Typhus occurred during the year are indicated by the letters . .	T F	Retail Stores and Shops, ...	△
Dwellings in which Small-pox occured during the year are indicated by the letters .	S P	Factories that are not offensive, .	⧖
Private Dwellings, ...	○	Factories offensive to health, . .	✠
Tenant-houses, ...	⊙	Slaughter-Pens and Butchers' Stalls, . .	
Dram-shops, ...		Stables for Horses or Cows, . . .	
Hotels and Lodging-houses, . . .		Churches and Chapels, ...	
Mercantile Warehouses, ...			

Statistical Recapitulation (*3d District*).

Squares,	74
" In Good Sanitary Condition,	32
" *Very Bad* " "	17
" Mixed " "	25
No. of Houses,	1,244
" Tenant,	450
" Rear,	95
Places where Liquor is Retailed,	341
Brothels,	81
Buildings occupied for Business Purposes only,	283
Stores occupying only parts of Buildings,	294
Meat and Vegetable Markets,	29
Groceries,	87
Manufactories and Workshops,	151
Stables,	108
Horses,	585

REPORT

OF THE

THIRD SANITARY INSPECTION DISTRICT. [SECTION B.]

B. M. KEENEY, M.D.,
Sanitary Inspector.

BOUNDARIES.—*North by Spring Street, east by Broadway, south by Canal Street, west by the North River. This Section* [B] *of the Third District comprises the southern segment of the Eighth Ward. There are* 33 *squares of buildings embraced in it.*

TOPOGRAPHY.—The principal portion of this district consisted originally of swamp and marshy ground. A sand-hill rose gradually from the low meadow line and extended to a point near the corner of Broadway and Broome, some 60 feet above the present grade. Another of a gravelly drift rising in the vicinity of Clark Street, had its greatest elevation north of Spring. The Lispenard Meadow,* for such was the name of the low swampy land, extended both north and south of Canal Street, and entering this section a few feet south of Howard Street on Broadway, it took a westerly direction from Mercer; the line ran northerly crossing Wooster one-third way from Broome to Spring Streets, thence northwesterly to Laurens; thence southwesterly to a point a few feet south of the southwest corner of Broome and Thompson; thence northwest to Sullivan, thence southwesterly to the centre of the square between Sullivan and Varick, Broome and Watts; thence northwest to the middle of the square between Varick and Hudson, north of Dominick; thence southwesterly and westerly to the river at Greenwich Street. The shore line ran due north and south just at the westerly edge of Greenwich Street, thereby showing that the two squares, one of which is now the site of Clinton Market, and the other between Greenwich and Washington

* See Dr. Harriot's *Map of the Third District.*

Streets, were reclaimed from the river. The meadow was covered more or less by water with the rising of the tide. The outlet of the Collect took its course about the line of Canal Street flowing to the river. A stone bridge at Broadway was once the only means of crossing the stream; afterwards bridges at Church Street and at other points were built.

The greater part of these low lands were filled in with the earth from the surrounding hills, while the two squares reclaimed from the river were filled in at a later date, in part by the refuse and rubbish from old buildings, cellars, etc.

The original level was low. The whole surface inclines gently towards Canal Street, with a difference between tide-water elevations of 20 feet 6 inches on Broadway, between Canal and Spring (Canal 10 feet 6 inches, Spring 31 feet above tide-water). Besides inclining toward Canal it slopes from Broadway toward Thompson Street, with a difference between the above-mentioned streets of 19 feet on Spring and 3 feet 3 inches on Canal Street. From Thompson Street westerly the grade ascends till we reach a line extending from the foot of Sullivan to the corner of Clark and Spring Streets (23 feet 3 inches above tide-water). From this line the inclination of the surface is gradually toward the river 4 feet above tide-level. That this district, with more than one-half made-ground, in many places but a few feet from the original swampy land and but 6 feet above tide-water, with several sewers that never more than half empty their contents, should be the locality of a great number of insalubrious quarters, and the source of pestilential and infectious diseases, would naturally be supposed, and which is confirmed by observations and statistics herewith.

Streets.—The streets are all narrow, varying from 40 to 60 feet, excepting that part of Broome between Broadway and Wooster, which is some 75 feet wide. Canal Street, the southern boundary of this section, some 60 feet wide at Broadway, gradually widens to the river. Spring, Broome, and Grand run parallel with each other in a northwesterly direction till they reach Sullivan, then inclining westerly to their terminations. Mercer, Greene, Wooster, Laurens, Thompson, and Sullivan are parallel to each other, running northeasterly from Canal Street. Clark, Varick, Hudson, Renwick, Greenwich, Washington, and West all run nearly north and south. The narrow streets, like Thompson, through which a double car-track is laid, do not allow room for a wagon to pass a car on either side next to the walk. Laurens, Wooster, Clark, and Sullivan are in a most filthy condition, giving off insalubrious emanations on which, perhaps, depend the many cases of fever, cholera infantum, dysentery, and pulmonary diseases. I have observed that near where other streets cross

the above-named streets there is a greater proportionate amount of sickness; and this fact I have shown by special reports of typhus and typhoid fever in Grand and Broome, and dysentery in Spring.

PAVEMENTS.—Broadway, Washington, and Greenwich are paved with trap-block pavement, all other streets with cobble stones, which in many places are badly in need of repair. Some of the streets, like Sullivan, Thompson, Laurens, and Watts, are higher at the corners than in the centre of the block, allowing the accumulations of slops and waste in the gutters along the street, that would otherwise find its way to the sewer. I would recommend in such cases where it is impracticable to raise the grade, that a culvert or drain be made connecting with the sewer. This would, in a measure, do away with such causes of insalubrity as arise from pools of standing water and vegetable decay; a striking instance of which may have been noticed by thousands of our fellow-citizens during the past summer in Thompson Street, while the Seventh Avenue car-track was being laid. The emanations from this source were observable several blocks away, and were attended by a material increase of sickness on that line through my inspection district.

SEWERAGE.—The streets are all sewered, excepting Watts, Laurens, Clark, Sullivan between Spring and Broome Streets, Grand between Thompson and Sullivan Streets, Spring between Broadway and Greene, Broome between Thompson and Sullivan, Dominick between Clark and Varick Streets. The sewers are of the oval form, excepting the one in Canal Street, which is built with a stone floor sloping toward the centre; its sides and top are of brick, the top is built in the form of an arch. The Canal Street sewer empties at the head of the pier at the foot of Canal Street, while the Spring Street sewer empties in the bulkhead; both below ordinary tide-water, but above low-tide level, thus allowing the sewer gas to escape, which, with a westerly wind, is very disagreeable to the people of the immediate neighborhood. I would recommend that in locations where the mouth of the sewer cannot be constructed below low-tide level, a covering be built in such a manner as to extend into the water even at low tides, at the same time allowing sufficient room for the free passage of the sewage. This plan would be a remedy against the stench near the mouth of sewers, and would also prevent the sewer gas from being driven back by westerly winds into houses without traps.

An important fact in regard to these sewers is, that the tide entering them at Canal Street, rises in the sewers of Thompson, Laurens, and Wooster Streets, blocking the Thompson Street sewer at the corner of Broome, and resulting in the overflow of the cellars, streets, and walks, in

case of a heavy fall of rain. This forcing back of the sewage by the tide, affecting the drainage, overflowing cesspools and privies, must certainly be considered a great source of insalubrity, and consequent increase of sickness and mortality in this section. That the atmosphere is excessively moist, I can affirm from observations made with the hygrometer at the corner of Broome and Thompson Streets—the average difference between the dry and wet bulbs showing $5\frac{1}{2}\frac{7}{0}$ degrees; while that of the standard hygrometer at the Eastern Dispensary, for the same periods, gave an average of $7\frac{7}{2}\frac{7}{0}$ degrees. The difference ($1\frac{1}{2}$ degrees) between the average of the two hygrometers, shows the greater proportionate amount of moisture at the corner of Broome and Thompson Streets.

Observations at 66 Grand Street (rear), where typhus fever had raged to some extent, gave an average of $3\frac{3}{1}\frac{3}{0}$ degrees; that of the standard during the same time, $6\frac{9}{1}\frac{9}{0}$ degrees; showing excessive humidity by a difference of $3\frac{1}{1}\frac{1}{0}$ degrees at Grand Street, or 45 per cent. more moisture than shown by the standard.

As a remedial measure, I would recommend that the mouths of the sewers be supplied with a tidal trap or floodgate, opening and shutting with the rising and falling of the tide. I am confident that a mechanical arrangement might be devised which would so close the mouths of the sewers as to prevent any reflow of sewage or water, and yet be self-acting, opening whenever the level of the sewage should be above that of the river.

The tide rising would so close this trap or valve, thus shutting off the great body of water which now ebbs and flows beneath many of the streets of this district. The public health would, no doubt, be materially improved by this improvement.

Sanitary Characteristics of the Several Squares.—Of the 33 squares that are comprised in this section, 7 of them are in a good, 7 in a mixed, and 19 of them in a bad sanitary condition. The first and principal cause which renders the squares insalubrious, is the deficiency of proper water and waste privileges and drainage, as in those streets without sewers—Clark, Laurens, Watts, and parts of other streets; imperfect surface-drainage, as in Thompson, Spring, Sullivan, Wooster, and Broome. In all of these streets the amount of sickness has been greater than in well-drained parts, as my daily reports will show. Privies that are not connected with sewers, and those left by negligent landlords to overflow, giving off their offensive and unwholesome gases, instances of which were at No. 57 Thompson and No. 66 Grand, where typhus and typhoid consigned to the grave 12 out of 18 cases.

The second cause can be found in the crowded condition of the tenant-houses, as, for instance, the double-tenement Nos. 44 and 46 Thompson, containing 45 families; No. 10 Thompson, with 18 families; No. 475 Broome, 17 families; and hundreds of others with an average of more than 6 families.

The third cause of special insalubrity of family domiciles is the crowded condition of the apartments; allowing an insufficiency of fresh air, as at No. 59 Thompson, where spotted fever occurred, I found eight people in two small basement rooms; and in the same court, where typhus raged last spring, eight people were living in one attic room, the roof slanting to the floor, preventing the occupants from standing erect, except in parts of the room. Many other cases I might mention where I have found eight or more persons living and sleeping in one room. It is very common to find a small bedroom where four or five people sleep, perhaps some of them on the floor.

The fourth cause: The filthy habits of the occupants, in not keeping their persons and apartments clean; allowing vermin to infest every thing. The disposition of garbage and slops—often being thrown out of a back window or between two houses in close proximity, there undergoing decomposition and generating unhealthy effluvia.

Fifth cause: The vicious habits of thousands that inhabit this section, and who follow a nightly vocation of assignation, thereby contaminating and spreading widely the syphilitic disease and other maladies.

The Inhabitants.—The population of this section is made up of various nationalities, and about equally divided into Americans, foreigners, and negroes. About one-third of these are of the laboring class, consisting mostly of foreigners and Americans. The majority of the retail stores are kept by the foreigners, who are an industrious and hard-working people. The Americans are mostly of old and respectable families, living in their own houses, and, with few exceptions, are well to do, while the negroes are a poor, lazy class, gaining their livelihood by pursuits attended with as little work as possible; there are, however, many exceptions in which the colored people—the washerwomen especially—work hard for all they have.

The disreputable class is very large, as 101 brothels in part testify. The prostitutes, however, are not all confined to brothels, hundreds of these vicious women living in the tenant-houses, assuming the guise of respectable people by day and following their vocation at night. This class is composed of nearly all nationalities, not excepting our own; they lead a miserable existence, turning night into day by their sinful practices and grovelling debaucheries, thus cutting short, as statistics prove, their average period of life.

The moral condition of many portions of this section of the city is lamentable; abounding with thieves, pickpockets, gamblers, and all sorts of bad men and women, who are ready to do any thing for money. The churches are few and small considering the dense population; a small proportion of the population is of the church-going class. The crowding of people into tenant-houses has a great tendency to moral as well as physical depravity in all portions of my inspection district.

Buildings.—There are 1,379 buildings of all kinds; and, deducting the churches and factories, nearly every house is a dwelling. 607 are tenant-houses; 445 are stores; 19 markets; 261 liquor shops; 101 brothels; 27 factories; 3 churches; and 4 school-houses.

Only 242 are strictly private dwellings, and these are mostly old buildings—built generally of brick, or frame houses with brick fronts. They are generally small in size, being from two to four stories. They are connected with sewers, except in those streets that have no sewers. Some have water in the house, but the greater proportion have a hydrant in the yard or under the front doorway. In those houses not connected with the sewer, the waste is either carried in pails and thrown into the street or allowed to flow through a small trough—in some cases flowing freely over the walk, a source of great inconvenience to passers-by, besides increasing the insalubrity of the district. The apartments are small in size, especially the dormitories, allowing only room for bedstead, washstand, &c., while the ventilation is entirely insufficient. There are no flues, air usually being admitted only by door and windows; consequently, in cold weather, the air is breathed over and over again, as in the crowded tenements, depriving the body of its necessary amount of oxygen, and leading to decay and death. The kerosene is used to some extent, but gas and stoves form the principal method of lighting and heating. The water-closets are in the yards, with but few exceptions, and many are not connected with the sewers.

Tenant-Houses.—The tenant-houses, which form nearly one-half of the whole number of buildings are scattered throughout the district, and with the exception of Clinton Market and three squares on Broadway are to be found in every square. The tenements are more numerous between Spring and Broome, from Clark to Mercer, and in the eight squares from Sullivan to Greene, from Broome to Canal Streets. In the square between Sullivan and Thompson, Spring and Broome, there are 79 houses, 57 of them are tenements. A greater part of these houses are old buildings, formerly occupied as private dwellings, but now used without alteration as tenant-houses. The buildings are mostly brick, varying from two to four stories, except the new buildings which are all

from four to six stories high. There are, however, many dilapidated frame houses in the section, several of them with stairs on the outside of the building leading to each floor. They vary in size from a small shanty with two families to three story houses with six to eight families. The brick vary more in size than the frame houses; some accommodating but three families while other double-tenements contain as many as forty-five families. There are many tenements without either water supply or waste privileges, the occupants being compelled to patronize their neighbors; such is the case at No. — Thompson and No. — Wooster Streets (rear), two notoriously filthy places, where fever and other diseases are always to be found. There is but a small proportion of the houses that have water-pipes leading into them, and those are recently-constructed tenements. Some have water in the rooms, others in the halls, while a larger proportion have water on the first and second floors only. The drainage of a few of the tenements is good, while that of the majority is decidedly insufficient. In many houses that are connected with the sewers, where the drainage would be perfect if kept free and clean, the occupants persist in throwing garbage and rubbish into the water-closets, and so blocking them up as to lead to offensive emanations, disease, and death, as special report of two cases of cholera infantum occurring at No. — Varick Street during the stoppage and accumulation of fæces in water-closet, will testify. Many houses have a trough that leads to the gutter, through which the slops and garbage are conveyed to the street; while others have no waste privileges, the occupants throwing their slops out of a door or window, allowing it to stand in stagnant pools, or find its way to the street through the alleys connected therewith; the "Thompson Street Arch" is a striking instance of the latter class. Very few tenements have water-closets in the house; they have privies in the yards, which, as a rule, are insufficient for the accommodation of numbers who are crowded into the houses; many are not connected with the sewers; are seldom cleaned, being allowed to overflow in some cases, rendering the neighborhood offensive with the insalubrious emanations. There are but few houses whose occupants have four rooms; there are more who have three rooms; the greater proportion have only two, while there are hundreds of families who have but one, living and sleeping in the same room. In the buildings in which I have calculated the size of the apartments, I find the area varies from 25 to 75 square feet and from 150 to 600 cubic feet to each person. These calculations were made in the apartments in which disease were found, and perhaps are not fair estimates of healthy quarters. Stoves and kerosene are the means of heating and lighting in tenant-

houses, gas rarely being used. I have found many of the cellars occupied by from one to three families. In the basements and cellars there has been a greater proportionate amount of sickness, resulting from the dampness. Rheumatism, pulmonary diseases, and cholera infantum have most often claimed my attention. The cellars are without ventilation except by doors. The negroes who inhabit some of the cellars are fond of excluding the light by placing dark curtains at the windows, thereby adding another cause to their already insalubrious quarters. I have often seen people living in basements where the floor was perfectly saturated with water. Another cause of insalubrity is found in the method of cleaning many of the tenements. Instead of scrubbing and thoroughly wiping, the occupants dash pails of water upon the floors, then sweeping them with a broom; there remains a greater amount of moisture than is conducive to health.

Dram-Shops, &c.—There are 261 dram-shops; 101 brothels, and a large number of small "policy-shops." The latter are a great curse to the people, especially the negro population, who are so infatuated with policy-playing as to sacrifice all other comforts and even spend their last cent in taking a chance. They are so absorbed in this small way of gambling, that if they dream of a number, or even of a person, they will try and ascertain his age, and taking his number of years or the number dreamed of, will risk large amounts, hoping to make a "hit." They seldom win, and the despondency that follows is drowned in the "flowing bowl." The majority of the drinking shops are low, filthy places, some having disreputable women in attendance. The brothels, with few exceptions, abound with venereal poison and vermin.

Stores.—There are four hundred and forty-five stores, and nineteen markets. A few are wholesale stores, the larger part of them are along Canal and Spring. Many are groceries which have bars for the sale of liquor, and some have meat and fish-stands attached. They affect the public health by promoting drunkenness, and in summer time by selling both meat and vegetables which have been kept on hand too long for healthy nutrition. Judging from the frequency with which I have found disease (shown by special reports) associated with the grocery and meat business as it is carried on in this section, I infer that the vegetable and animal decomposition constantly going on produces a great deal of the sickness and mortality.

Factories.—Are all small, mostly pianoforte and cabinet manufactories, employing but few hands; having no particular effect upon the public health.

Stables.—There are eighty stables in the district of my inspection;

thirteen of them public or livery, and sixty-eight of them private. That they produce a deleterious effect upon the health of their immediate localities I infer from the marked and fatal prevalence of certain peculiar diseases in their immediate and most exposed vicinity. Cholera infantum is one of the maladies here referred to.

Churches and School-Buildings.—There are but three churches and four school-houses. The confining of young children for several hours a day in these houses is no doubt very injurious to their constitutions, inducing, as it may, pulmonary tuberculosis. Three of these school-houses are located in the most insalubrious part of this district. Two of them, No. 64 Grand and No. 61 Thompson, are next to typhus fever-nests. These are peculiarly liable to become agencies for spreading widely any infectious disease.

Prevailing Diseases.—The prevailing diseases of the past season have been fevers of the typhus, typhoid, remittent and intermittent types, cholera morbus, cholera infantum, scarlatina, dysentery, and diarrhœa. With few exceptions I find them all confined to the locality between Varick and Wooster Streets from Canal to Spring Streets. By referring to the map of original ground it is seen that this part of the section is nearly all made land filled in on the meadow. It is the lowest of the district, poorly drained, and deficient in sewers. It is densely populated, nearly all the houses being tenements. The typhus and typhoid fevers have been of a malignant type in two houses, twelve out of eighteen cases proving fatal. Cholera infantum has probably consigned many more to the grave during the past summer than all other diseases in my inspection district. In every case examined I have found it associated with some well-marked source of insalubrity; vegetable and animal decomposition have been the most prominent causes. The proximity of stables and offensive water-closets have often claimed my attention. In three cases, in private practice, occurring in Tenth and Twelfth Streets, where the children of the neighborhood were all well, the mothers of the three children healthy, having a plentiful supply of good milk, none other than the above-named causes were apparent. During the month of August there were 576 deaths in the city from cholera infantum. 1,776 children died from various causes during the four weeks ending with August 28, 1864. How many of those lives may have been saved under proper sanitary rules and regulations I am unable to say. That 50 per cent. die from preventible causes in my inspection district I do not doubt. I have found very filthy and insalubrious quarters where sickness was seldom known. These quarters were near the river. The increased ventilation caused by the high winds sweeping from the river, with better drainage than in many parts of the district, will probably explain the fact.

Occasionally I have found typhus fever among immigrants; it has usually been of a mild type, resulting favorably, and has been but slightly contagious during the past summer months. The same cases would no doubt have infected whole neighborhoods during the cold season, when all the doors and windows are closed, when the poison would be nurtured, and the inmates enfeebled by an insufficient supply of fresh air. The mortality in the latter case would also be relatively greater.

The sanitary improvement in my district during the progress of my inspection was plainly visible. Exceedingly filthy places, overflowing cesspools and privies, which were numerous in my first visits, were suddenly cleaned. Often upon my second visit, with paper and pencil in my hand to sketch the filthy scene, I would find the quarters cleaned and whitewashed, and the air, instead of being laden with disagreeable odors, would be comparatively pure and wholesome. Many of these sudden transitions were from fear or a presumption that my inspection had some official authority; but the greater part were brought about by explaining to the people the necessity of cleanliness. Pools of filthy water from obstructions at the street corners, and accumulations along the gutters, would quickly disappear, when the people would be convinced of the deleterious effect upon the public health.

It will be well for the inhabitants of New York City, and especially for those of this section, when there shall be laws not only to compel them to keep their houses and surroundings clean and free from the effluvia resulting from vegetable and animal decomposition, but to prevent the overcrowding of tenant-houses, where fatal diseases are generated, and where death walks stealthily around. In concluding this report I feel warranted in stating that if my labors have not been attended with results which have advanced the cause of science, they have, as I believe, been instrumental in a marked improvement of the sanitary condition of Section B of the Third Inspection District.

Statistical Recapitulation.

Squares,	33	Stores,	445
" in good sanitary condition,	7	Liquor shops,	261
" in mixed " "	7	Meat and vegetable markets,	19
" in *very bad*, "	19	Brothels,	101
Houses,	1,379	Factories,	27
" private,	242	Churches,	3
" tenant,	607	School houses,	4
" rear	267	Stables,	80

CHATHAM SQUARE
E. BD. WAY
HENRY STREET
STREET



EXPLANATION.

Tenant Houses and Rookeries where the Space to each occupant is less than eight hundred cubic feet.
Private Dwellings
Churches, Schools and Places of Resort
Shanties or Untenantable Buildings
Stables.
Privies.
Privies in an extremely offensive condition.
Hydrants.
Surface Gutters
Passage through house, leading to rear Buildings
Stories.
Basements.
Families
Persons.
Figures underlined Records of Cases Space & each occupied
Smallpox Localities
Houses where Typhus or Typhoid Fever has occurred during the past Year.
Houses where Small Pox has occurred during the past Year.
Boarding Houses
Groceries
Liquor Stores, or Drinking Places
Street Sewers
Figures on Street Crossings indicate Elevation above High Water Mark.

Sanitary and Social Chart
OF THE
FOURTH WARD
OF THE
CITY OF NEW-YORK
To accompany a Report of the
4TH SANITARY INSPECTION DISTRICT,
Made to the Council of Hygiene of the
CITIZENS' ASSOCIATION
BY
E. R. PULLING, M. D.
Assisted by
F. J. RANDALL.

D. APPLETON & CO. 443 & 445 BROADWAY, N.Y.

REPORT

OF THE

FOURTH SANITARY INSPECTION DISTRICT.

EZRA R. PULLING, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Fourth District, comprising the Fourth Ward, is bounded by Chatham, Catharine, and South Street, Peck Slip, Ferry, and Spruce Streets. Its average length and breadth are respectively about* 1,900 *and* 1,600 *feet.*

TOPOGRAPHY.—Deducting the surface occupied by streets, &c., a superficies remains of about 2,240,000 square feet, or about 8,227 square rods, equal to 896 building lots 25×100 feet. The soil is sandy and porous. About one-fifth of the entire area is artificial, having been filled in at a remote period. It includes a depressed space near its western border, formerly known as *Beekman's Swamp*, which contains about 100,000 square feet, and still retains its paludal designation among the leather dealers by whose places of business it is now chiefly occupied.

The northeast and the northwest corners are the most elevated points, each being about thirty-six feet above high-water mark. From the former, the ground slopes rapidly south and west. From the latter, the slope is by a somewhat abrupt declivity, south and east. The average elevation of the district above high-water mark is about sixteen feet. Its natural drainage is good, as the ground, except in the vicinity of the river, is generally sloping, the declivity being steepest in those streets which run from Chatham to South.

The following named streets and parts of streets have no sewers within the boundaries of this ward: East Broadway, Henry, Hague, Chestnut, New Chambers, South, Front, Water, Cherry from Catharine to Roosevelt, Pearl from William to Bowery, Madison from Pearl to Roosevelt, Oliver from Chatham to Madison, Frankfort from Cliff to Bowery.

All the sewers empty into the East River below high-water mark; for about one-half their entire length they are swept out by the refluent tide.*

Of the 714 buildings classed as tenant-houses, less than one-half were found to have a waste-pipe or drain connected directly with the sewer. Where this is wanting, liquid refuse is emptied on the sidewalk or into the street, or in some instances into sinks in the domiciles communicating with a common pipe which discharges its contents into the open gutter to run perhaps hundreds of feet, giving forth the most noisome exhalations, and uniting its fetid streams with numerous others from similar sources, before reaching its subterranean destination.

Slops from rear buildings of such premises are usually emptied into a shallow gutter cut in the flagging and extending from the yard, or space between front and rear buildings, to the street. This is often clogged up by semi-fluid filth, so that the alley and those parts of the yard through which it runs are not unfrequently overflown and submerged to the depth of several inches.

There are more than four hundred families in this district whose homes can only be reached by wading through a disgusting deposit of filthy refuse. In some instances, a staging of plank, elevated a few inches above the surface, is constructed through the alleys. This affords to the residents the advantage of a dry walk, but in a sanitary point of view its influence is scarcely favorable, since it prevents the removal of the offensive matters beneath.

I cannot report favorably on the condition of the thoroughfares in my district. Belgian pavement has been laid in Chatham, New Bowery, New Chambers, and South Streets, and in part of Pearl Street. All the other streets have the cobble-stone pavement, which in most instances is in bad condition, and in all is very difficult to keep clean. As a sanitary measure alone, an improved pavement is greatly needed in all these densely-populated streets. It is hardly necessary to add that a thorough cleansing is equally required.

I have indicated on the large map which accompanies this report, the localities in which accumulations of street-filth were observed at the time of inspection. From this it appears that less than one-third of the entire street surface was in a tolerably cleanly condition, while of the cobble-stone pavement less than one-sixth part was clean. Much of the latter, in fact, never is clean, for the filth lodging in the interstices of its

* The original water-line is copied by permission from a new topographical map by Gen. E. L. Vielé, whose courtesy I take this opportunity to acknowledge.

surface is never wholly removed. Besides, it is often depressed or worn into deep ruts, which furnish receptacles for both solid and fluid matters of the most offensive character.

I think there is no more efficient means of cleansing such streets than by directing a stream of water over successive portions of their surface, thus washing the filthy deposit into the gutters and thence into the sewers.

Courts and alleys are numerous, the latter generally narrow, averaging less than three feet in width, where they form conduits for the drainage from rear houses; they are uniformly in bad condition.

The entire number of buildings in this district is 1,507.

Classified according to the purposes for which they are used:

770 are occupied chiefly or wholly as residences.
* 682 " " " for business purposes.
8 are Churches and Schools.
47 are Stables.

Classified according to the material of which they are constructed:

1,394 are built of brick, stone, or iron.
113 " wood.

Classified according to position:

1,342 front on the street.
165 are rear houses.
Of the 165 rear buildings,
108 are Tenant-houses.
20 are occupied for business purposes.
37 are Stables.

TENANT AND CROWDED HOUSES.—Under this head I have included: 1st. All tenant-houses built as such; and, 2d. All those used chiefly or wholly as residences in which the occupied space gives a *pro rata* of less than 800 cubic feet to each inhabitant, without reference to the number of families or the population, or to the original design or construction of the buildings. The total of these is 714, of which 656 are brick and 58 are wood.

Of these 242 were built as tenant-houses and divided into domiciles.

Of these 472 were originally designed for occupancy by a single family or for business purposes.

* Many of these have one or more families residing in them.

The first class is sub-divided as follows in accordance with the number of domiciles:

Of those	having	2	domiciles	there are	8
"	"	3	"	"	16
"	"	4	"	"	33
"	"	5	"	"	14
"	"	6	"	"	44
"	"	7	"	"	15
"	"	8	"	"	28
"	"	9	"	"	11
"	"	10	"	"	25
"	"	11	"	"	3
"	"	12	"	"	10
"	"	13	"	"	2
"	"	14	"	"	4
"	"	15	"	"	1
"	"	16	"	"	12
"	"	17	"	"	1
"	"	18	"	"	2
"	"	20	"	"	5
"	20 to 50		"	"	6
"	50 to 100		"	"	1
"	over 100		"	"	1

The whole number of domiciles in houses of this class is 2,119.

The average number of domiciles in each house of this class is about $8\frac{3}{4}$.

Both classes together are subdivided in accordance with the number of families occupying each house at the time of inspection:

Of those	occupied by	1	family	there were	24
"	"	2	"	"	66
"	"	3	"	"	75
"	"	4	"	"	69
"	"	5	"	"	49
"	"	6	"	"	80
"	"	7	"	"	42
"	"	8	"	"	40
"	"	9	"	"	17
"	"	10	"	"	29
"	"	11	"	"	4

Of those occupied by	12	families	there were	12
" "	13	"	"	2
" "	14	"	"	4
" "	15	"	"	1
" "	16	"	"	12
" "	17	"	"	1
" "	18	"	"	1
" "	19	"	"	1
20 and less than	50	"	"	6
50 and less than	100	"	"	1
over	100	"	"	1
not ascertained		"	"	177

The average population of this class of houses is about 28.

DESCRIPTION OF AN ORDINARY TENANT-HOUSE.—As an example of an ordinary tenant-house, I select one from James Street for description. It is a brick building five stories high. A door of entrance and a liquor store occupy the front of the first story. Entering a hall 4½ feet wide, we grope our way up a steep stair-case 2½ feet wide, which is perfectly dark, and reach the second-story landing, from which open four doors communicating with the same number of domiciles.

Calling at the first of these we enter a room 14×12 feet with ceiling 8 feet high, having on one side two moderate-sized windows. The small fire-place is closed, and a stove exhausts rapidly the scanty atmospheric supply which finds its way into the apartment through crevices of the door and windows. We observe that a pungent odor of coal-gas pervades the apartment.

Opening into this room is another, having an area of 9×12 feet, with the same height of ceiling as the former. It has no other opening than the door of communication, and of course possesses no means whatever of efficient ventilation. Looking into this we see two beds beside a quantity of bedding on the floor between them, indicating that this is the dormitory of half a dozen persons. A sickening and stifling odor, most offensive to the unaccustomed senses, pervades this apartment and poisons the atmosphere inhaled by the residents.

The simple fact that this is the abode of six persons might be a sufficient explanation of the latter phenomenon; but when we recollect that they belong to a class who attribute most of their physical ills to a cause, the exact reverse of that to which they are generally due, viz., to exposure to the external atmosphere, and whose sanitary creed teaches them to exclude it from their apartments as far as possible, we can only

wonder that the mephitic gases generated and concentrated in these abodes do not destroy health and life even more speedily than they appear to do.

We find in this domicile a *pro rata* of about 370 cubic feet to each occupant. At the time of visit, the mother and two small children are the only members of the family present. The latter we find to be types of a class. Although they have no form of active disease present, they are strumous, debilitated, and lacking in muscular development. We notice that the conjunctiva is inflamed, and learn without surprise that every member of the family has been affected with ophthalmia. The mucous membrane of the eyes as well as of the air-passages resents the constant irritation of smoke and dust.

The remaining domiciles are counterparts of the first as to arrangement and condition, and almost so as regards their occupants. The halls are practically destitute of ventilation. The occasional opening of the door of entrance below, or of those of the domiciles above, scarcely has any favorable influence on the condition of the atmosphere. From the latter sources, indeed, the halls are constantly filled with noisome and fetid exhalations. Their floors are washed occasionally though rarely, but the walls frequently remain for years without white-washing or cleansing. Wherever the hand comes in contact with them they impart a sticky or pasty sensation; and when scraped, an actual deposit of filth is brought away.

Pursuing our investigations, we next examine the rear of the premises:

Through a narrow alley, we enter a small court-yard which the lofty buildings in front and rear keep in almost perpetual shade. Entering it from the street on a sunny day the atmosphere seems like that of a well. The yard, which is about 25 feet square, is filled with recently-washed clothing suspended to dry. In the centre of this space are the privies used by the population of both front and rear-houses. Their presence is quite as perceptible to the smell as to the sight.

Making our way through this enclosure, and descending four or five steps, we find ourselves in the basement of the rear-building. We enter a room whose low ceiling is blackened with smoke, and its walls discolored with damp. In front, opening on a narrow area covered with green mould, two small windows, their tops scarcely level with the court-yard, afford at noonday a twilight-illumination to the apartment. Through their broken panes they admit the damp air laden with effluvia which constitutes the vital atmosphere inhaled by all who are immured in this dismal abode.

A door at the back of this room communicates with another which is entirely dark, and has but this one opening. Both rooms together have an area about eighteen feet square, and these apartments are the home of six persons. The father of the family, a day laborer, is absent. The mother, a wrinkled crone at thirty, sits rocking in her arms an infant whose pasty and pallid features tell that decay and death are usurping the place of health and life. Two older children are in the street, which is their only playground, and the only place where they can go to breathe an atmosphere that is even comparatively pure. A fourth child, emaciated to a skeleton, and with that ghastly and unearthly look which marasmus impresses on its victims, has reared its feeble frame on a rickety chair against the window sill, and is striving to get a glimpse at the smiling heavens whose light is so seldom permitted to gladden its longing eyes. Its youth has battled nobly against the terribly morbid and devitalizing agents which have oppressed its childish life—the poisonous air, the darkness, and the damp; but the battle is nearly over, it is easy to decide where the victory will be.

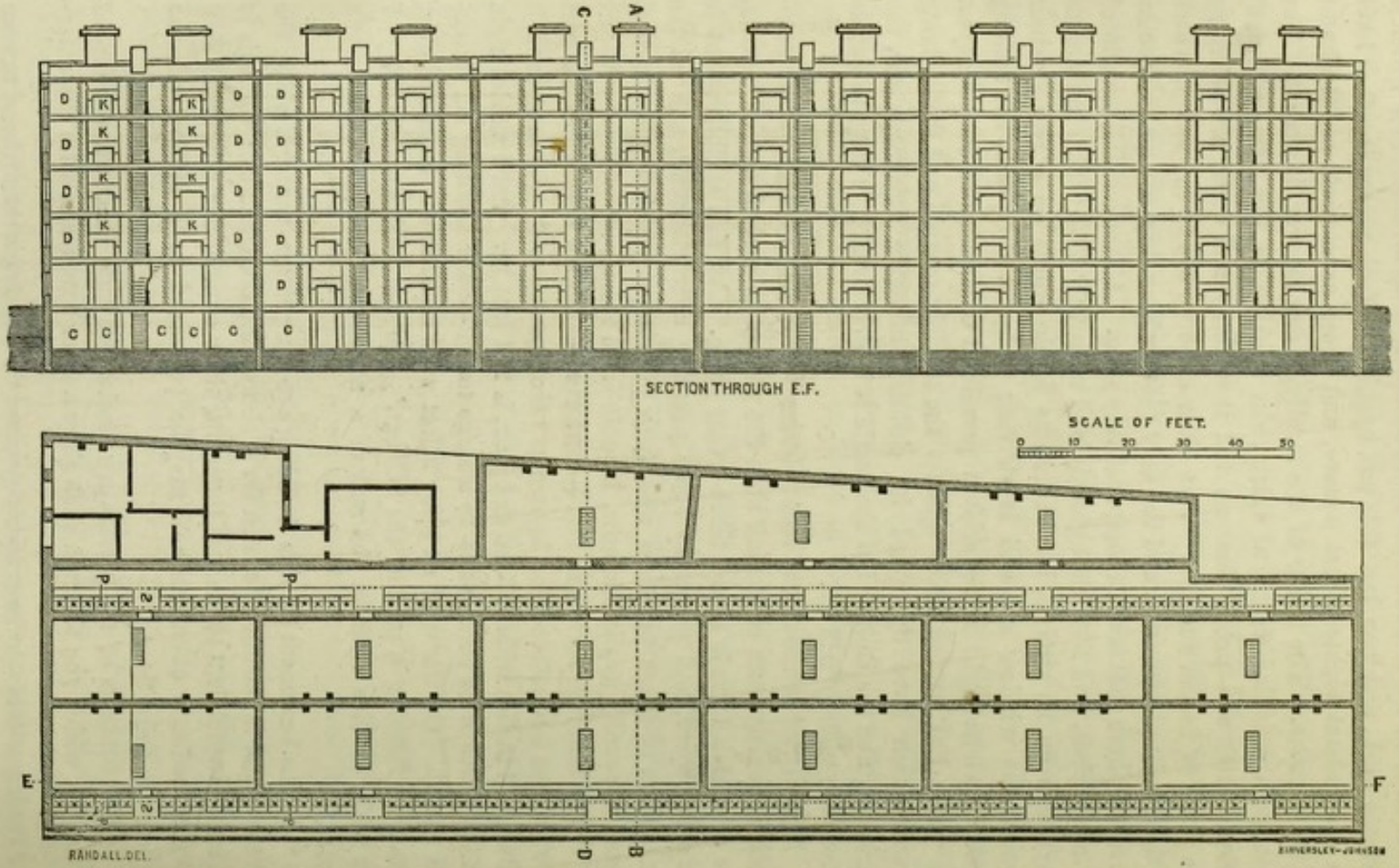
My district contains one tenant-house which has become rather notorious in consequence of having been the subject of several special reports, one of which I made about three years since. As this establishment is very extensive, and possesses some peculiar characteristics, and as the description of these premises and their population which I gave in that report is equally applicable now, I quote from it here: *

"The building known as No. — and No. — Cherry Street forms a part of what has heretofore been known as 'Gotham Court.' As measured, it is 34 feet 4 inches wide in front and rear, is 234 feet long and 5 stories high. On the north it is contiguous to a large tenant-house fronting on Roosevelt Street. On the west an alley 9 feet wide separates it from a similar structure forming a part of the 'Court.' On the east another alley, 7 feet wide, divides it from the rear of a number of houses on Roosevelt Street.

"In the basement of this building are the privies, through which the Croton-water is permitted to run for a short time occasionally; but this is evidently insufficient to cleanse them, for their emanations render the first story exceedingly offensive, and may be perceived as a distinct odor as high as the third floor.

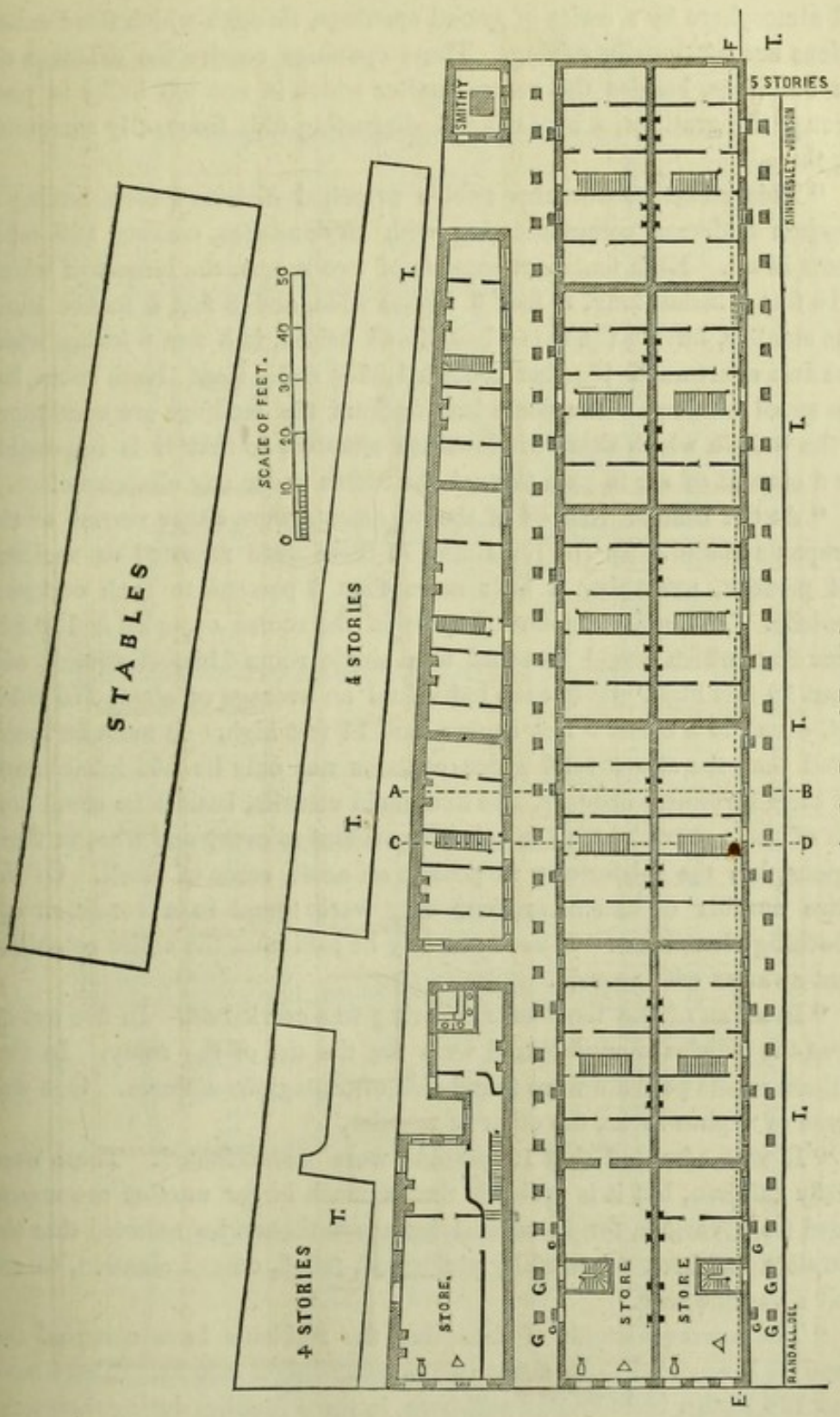
"The contents of the privies are discharged into subterranean drains or sewers, which run through each alley and communicate with the exter-

* The Inspector of the Fourth District prepared the special report here referred to, when he was Visiting Physician to the New York City Dispensary in the same district in the year 1859–'60.—Editor.



"GOTHAM COURT."—LONGITUDINAL ELEVATION AND CELLAR-PLAN.

C C The Cellar. D D The Bedrooms. K K Living-rooms. P P Privies. S S Grating over Privies.



"GOTHAM COURT."—GROUND PLAN AND SURROUNDINGS.

nal atmosphere by a series of grated openings, through which feted exhalations are continually arising. These openings receive the drainage of the buildings, besides the refuse matter which is not too bulky to pass through the gratings, a bordering of disgusting filth frequently surrounding them.

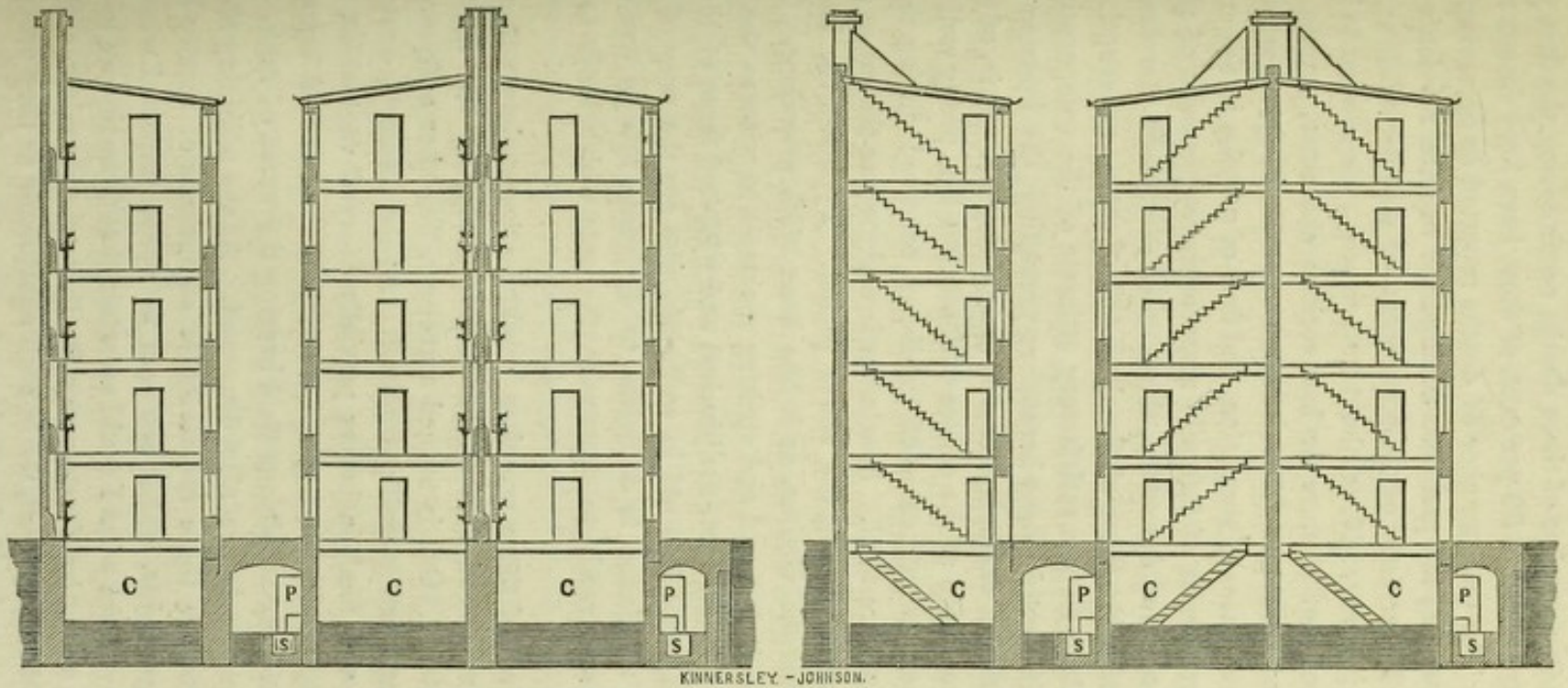
"This structure contains twelve principal divisions, each having a common staircase communicating with 10 domiciles, making 120 tenements in all. Each tenement consists of two rooms, the largest of which is 14 feet 8 inches long, 9 feet 6 inches wide, and 8 feet 4 inches high. The smaller, having the same length and height, is 8 feet 6 inches wide. The two apartments together contain 1,955½ cubic feet. Each room has one small window. The doors leading from the landings are contiguous to the wall in which these windows are situated, so that it is impossible for a current of air to pass *through* the rooms under any circumstances.

"At the time of visit 49 of the tenements were either vacant or the occupants absent. In the remaining 71 there were reported as residing 504 persons, averaging a little more than 7 persons to each occupied domicile. The entire amount of space in the rooms occupied is 138,840 cubic feet, which would be equal to a single room 118 feet square, and about 10 feet high, giving each individual an average of about 275 cubic feet, equal to a closet 5 feet square and 11 feet high. It must be recollected that the above total space contains not only its 504 inhabitants, but their furniture, bedding, and household utensils, besides no small portion of their excretions, as is painfully evident to every one who, in these regions, has the misfortune to possess an acute sense of smell. Of the entire number of tenements, four only were found in a condition approaching cleanliness. It need scarcely be said that the entire establishment swarms with vermin.

"In seven of the tenements tailoring was carried on. In five out of seven the articles manufactured were for the use of the army. In two of these rooms patients were found sick of contagious diseases. One was a case of typhus fever, the other of measles.

"It was admitted that 19 persons were unvaccinated. These were chiefly children, but it is probable that a much larger number are unprotected from variola, for in several instances those who asserted that the operation had been successfully performed, failed, on examination, to exhibit a vaccine scar.

"The average length of time that the residents have occupied the premises is reported to be about two years and eight months. There have been 138 births, including 12 still-born, in these families during their term of residence in the building. Of these only 77 are now living, showing an



TRANSVERSE SECTIONAL ELEVATION OF THE GOTHAM ROOKERY.

C C Cellar. P P Privies. S S Sewer.

[The plan illustrates how the domiciles are superimposed, one above another; and how the loathsome cellar and privies are reached.]

infant mortality of over 44 per cent. in two years and eight months; but as by far the greater number of these deaths occur during the first year, it may be safely assumed that 30 per cent. of those born here do not survive a twelvemonth. The total number of deaths reported as occurring in the families now occupying the premises during their term of residence there, is 98, or about 19½ per cent. of the population for that period.

"Of the 504 inmates, 146, or about 29 per cent., were found to be suffering from diseases of a more or less serious character, among which were four cases of small-pox (three of them unvaccinated), eight cases of typhus fever, seven cases of scarlatina, and four of measles in the eruptive stage, twenty-seven cases of infantile marasmus, twelve cases of phthisis pulmonalis, five cases of dysentery, three cases of chronic diarrhœa, and a large number of slight cases of diarrhœa and of cutaneous eruptions.

"It is difficult to form a satisfactory estimate of the comparative frequency of the different diseases heretofore prevailing, the inmates being, in a great proportion of cases, ignorant of their character. It is, of course, equally difficult to arrive at the causes of death, but it is pretty well ascertained that at least twenty cases of small-pox occurred during the past year, of which six were fatal. Scarlatina is assigned as the cause of sixteen deaths occurring during the above period. Typhus fever undoubtedly claimed numerous victims, as it has been quite prevalent. To the unaccustomed eye it is a sad and striking spectacle to witness the attenuated forms, the sunken eyes, the pinched and withered faces of the little patients, young in years but old in suffering, who are the prey of infantile marasmus. A glance is sufficient to designate *this* as one of the ghostly janitors, ever ready to open wide the gate which leads to early death.

"A description of these premises would be incomplete without, at least, a passing notice of two establishments occupying the front portion of the first story. One is termed a grocery, the other a liquor store. Both are apparently pretty well patronized. At the former are retailed a variety of articles of food, including partially-decayed vegetables, rather suspicious looking solids, bearing respectively the names of butter and cheese, and a decidedly suspicious fluid bearing the name of milk. Beer and alcoholic compounds are also dispensed. At the adjoining shop the staple commodities are those indescribable compounds of sundry known and unknown ingredients, which are sold as 'pure imported wines and liquors.' I believe from what I could ascertain that these liquors are used to a considerable extent by almost every family on the premises, a fact, indeed, which might be expected, for in such apartments as they occupy the poisonous air begets a deadly lassitude, and generates an inordinate desire

for stimulants. To the effect of these unwholesome viands and poisonous beverages may probably be traced much of the diarrhœa which prevails here even at this season, and which is vastly increased in amount during the summer months.

"On the whole, perhaps, this section of Gotham Court presents about an average specimen of tenant-houses in the lower part of the city in respect to salubrity. There are some which are more roomy, have better means of ventilation, and are kept cleaner; but there are many which are in far worse condition, and exhibit a much higher rate of mortality than this."

The number of inhabited basements and cellars is 224, occupied by 268 families, or about 1,400 persons. Their depth below the "curb" or street level varies from 2 to 8 feet, averaging about 4½ feet.

The floors of	16	are	below high-water mark.		
"	91	"	less than 10 feet	above	high-water mark.
"	84	"	from 10 to 20	"	"
"	28	"	" 20 to 30	"	"
"	5	"	over 30	"	"

In the sub-tidal basements 19 families, or 110 persons, live *beneath the level of the sea.*

This submarine region is not only excessively damp but is liable to sudden inroads from the domains of Neptune. At high tide the water often wells up through the floors, submerging them to a considerable depth. The constant repetition of this aquatic episode in domestic life, has led to the abandonment, as residences, of several of these basements, the number now occupied being much smaller than it was formerly.

They are all damp, those in the least elevated localities, of course, being most so. In very many cases the vaults of privies are situated on the same or a higher level, and their contents frequently ooze through walls into the occupied apartments beside them. Fully one-fourth of these subterranean domiciles are pervaded by a most offensive odor from this source, and rendered exceedingly unwholesome as human habitations. These are the places in which we most frequently meet with typhoid fever and dysentery during the summer months. I estimate the amount of sickness of all kinds affecting the residents of basements and cellars compared with that occurring among an equal number of the inhabitants of floors above ground, as being about in the ratio of 3 to 2.

PRIVIES.—Of the privies in this district less than 30 per cent. are connected with drains or sewers. About 15 per cent. are situated in houses

occupied as dwellings, generally in the basement. At least 10 per cent. were found in a very offensive condition. The proximity of the latter to the fever localities is shown by the large map. There is a section of my district embracing at least nine blocks, in every part of which the peculiar odor arising from privies is always distinctly perceptible during the summer months. From this region fever is never absent. I refer to typhus and typhoid, for intermittent and remittent fever do not prevail in this neighborhood even in the low tract adjoining the river. Such a gentle fiend as paludal miasma flies affrighted from the terrific phantoms of disease that reign supreme in this domain of pestilence.

RENTS.—In regular tenant-houses the rent of each domicile at present averages $9 per month, or $108 per year; the entire rent of each of these houses thus averaging $950 per annum.

Excessive Crowding of Houses upon Lots.—In some cases front and rear buildings are situated on lots less than 80 feet deep. They are generally crowded into the smallest possible space, and are constructed in the cheapest manner.

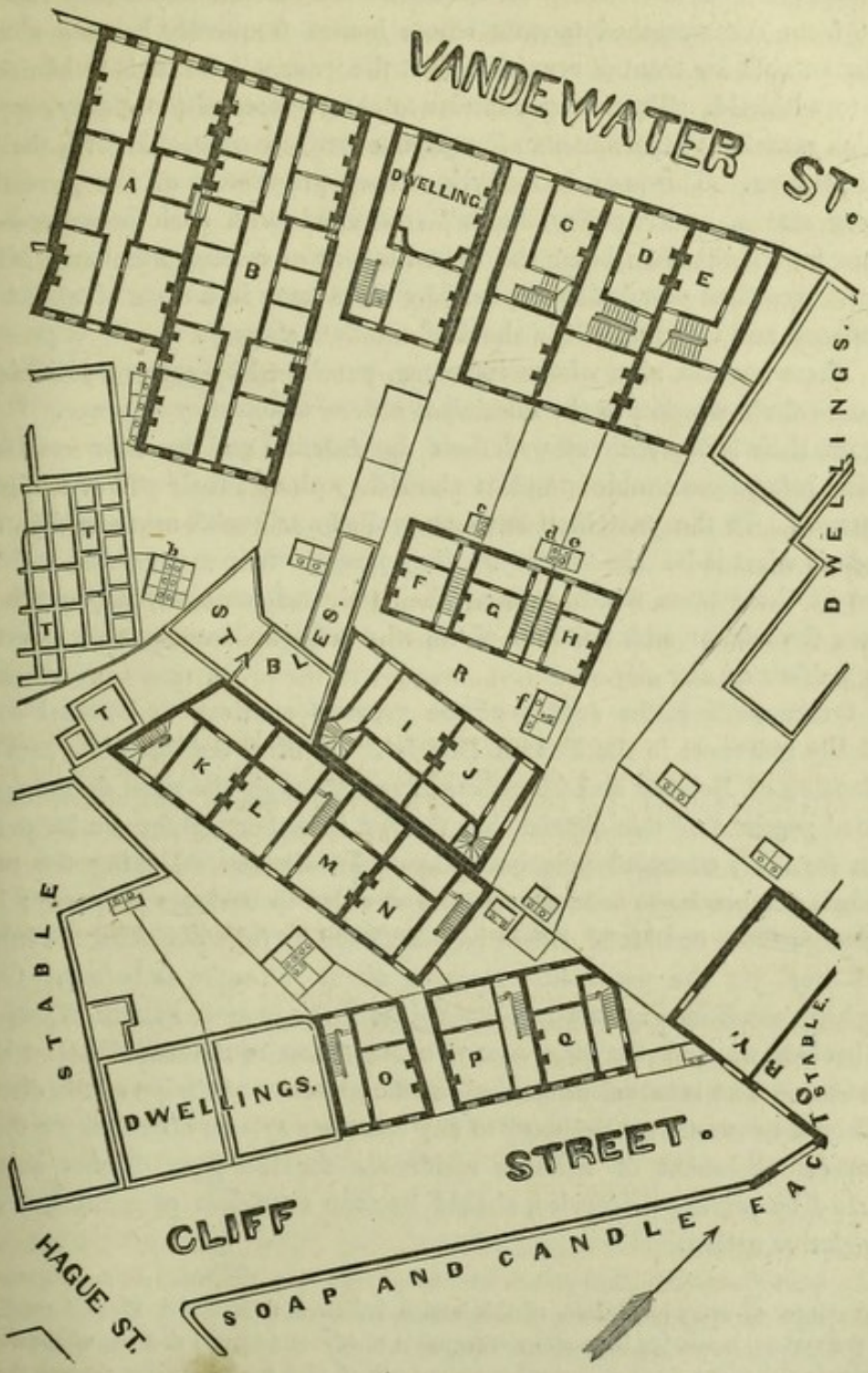
They are, in many instances, owned by large capitalists, by whom they are farmed out to a class of factors who make this their especial business.* These men pay to the owners of the property a sum which is

* The diagram on the opposite page represents an area eighty yards long and fifty yards wide, including the *cul-de-sac* at the termination of Cliff Street. It illustrates the proximity to crowded habitations of offensive and dangerous nuisances, often observed in the lower part of the city. The diagram presents an accurate ground plan of each tenant-house which it embraces. Within this space are 20 dwellings occupied by 111 families, and having a population of 538 persons. A soap-and-candle factory, a tannery, and five stables, in which are kept not less than 30 horses, are also wholly or partially included within its limits.

A, B, C, D, E, are tenant-houses fronting on Vandewater Street. An alley four feet wide running through C forms the sole communication with the five tenant-houses F, G, H, I, J, which open into the small court R, in which stands their common privy, *f*, situated within three feet of the hall door of one of the houses, which is constantly pervaded by its noisome odor; *c*, *d*, *e*, are privies situated immediately under the windows of the houses F, G, H; *a* and *b* are privies belonging to the tenant-houses A and B; K, L, M, N, are tenant-houses standing back to back with two of those in the court above mentioned and with three stables to which access is had from Vandewater Street. The position of two stables fronting on Cliff Street will also be observed. The soap-and-candle factory, whose frontage is shown in the cut, is a very extensive one, and its emanations vitiate the atmosphere for a considerable space around.

T, T, T, represent a series of tan vats, in the rear of a leather factory on Frankfort Street, which generally contain a large number of green hides in a very offensive condition. The peculiar stench from this source is usually quite perceptible through the entire area shown in the engraving.

This locality lies on the borders of a former marsh known as "Beekman's Swamp." The



CROWDED AREAS AND AN INSALUBRIOUS QUARTER.

considered a fair return on the capital invested, and rely for their profits (which are often enormous) on the additional amount which they can extort from the wretched tenants whose homes frequently become almost untenantable for want of repairs, which the "agent" deems it to his interest to withhold. These men contrive to absorb most of the scanty surplus which remains to the tenants after paying for their miserable food, shelter, and raiment. They are, in many instances, proprietors of low groceries, liquor stores, and "policy shops" connected with such premises—the same individual often being the actual owner of a large number. Many of the wretched population are held by these men in a state of abject dependence and vassalage little short of absolute slavery.

These are the men whose influence, purchased by corrupt politicians, secures their election to the municipal offices which they disgrace. Holding in their grasp the votes of their dependents, and by their combined action being thus enabled to elect whom they please, their power is almost supreme. In the past they have controlled our health organization, and made it what it is. In the future they propose to perpetuate it. Confident in the system which secures their political strength, they set at defience the wishes and opinions of all who take an intelligent interest in the welfare of our city.

Overcrowding, the source of the greatest sanitary and social evils, steadily increases in the Fourth District. Within the last ten years the extension of Bowery and Chambers Street through the most densely-populated portions of this district, has thrown into thoroughfares a large section formerly occupied principally by tenant-houses. During the same period, another large section has been devoted to business purposes; but, although these combined causes have reduced by fully one-third the inhabited area, yet the population remains about the same as before. Good hygienic conditions cannot be obtained until the present system of *packing* is broken up and the *pro rata* of cubic space to the individual at least doubled. The removal of one-half of the present population of the district will be a necessary preliminary to any complete system of sanitary reform. The establishment of suitable residences for the poor, if not accomplished by private enterprise, should become a subject of municipal and legislative action.

appearance of every inhabitant of this region indicates a low and vitiated condition of the system, rendering it specially susceptible to adynamic forms of fever, which, during epidemic visitations, have on several occasions spread with terrific rapidity through the entire quarter. Typhus fever has prevailed during the past year to a considerable extent in some of these houses, while small-pox has been rife in the tenant-houses on Vandewater Street. It has been observed that scarlatina is especially malignant and fatal here.

A tract equal in extent to Central Park, occupied by dwellings designed for their homes, which should possess the indispensable hygienic conditions of sufficient air-space, and light, good ventilation and drainage, and placed under such police regulations as should secure the exclusion or prompt suppression of all nuisances, would be an inestimable boon to this class, and a greater benefit to the entire community than even the splendid ornament to our city above named. Simply as an investment of funds there is no doubt that such an enterprise would *pay*, but its benefits could not be measured by any standard of pecuniary profit. It would be the proudest work of which our imperial city could boast, and thousands of her sons thus rescued from degradation and wretchedness would, in future years, "rise up and call her blessed."

Vacant Lots, &c.—There are but few vacant lots in this district, and on most of them buildings are now in process of construction. There are fifteen coal yards. As far as I am aware, none of them exercise any unfavorable influence on the public health beyond that caused by the great amount of dust which at times arises from them, to be inhaled by the neighboring residents.

The only place of sepulture is the "Jews' Burying Ground," a very ancient cemetery, which of late years has been much reduced in size by the extension of the Bowery. It now has a frontage on the latter street. Its present area is about 5,000 square feet.

Liquor Stores.—The number of liquor stores and drinking places is 446; which is one to every 8 families, or one to every 49 persons. 329 are located in houses otherwise occupied as residences; 28 are reputed to be brothels; 5 or 6 are "sailors' dance-houses." The number of places where articles of food are sold is 134, or one to every 27 families, or 164 persons.

Food and Markets.—The quality of the food sold at the corner groceries and butchers' shops in this neighborhood deserves a more extended notice than it can receive here. A casual examination shows much of it to be unfit for human sustenance. Unwholesome meat, particularly *slunk* veal, is constantly vended and consumed. Piles of pickled herrings are exposed to the air till the mass approaches a condition of putridity; and this slimy food, with wilted and decayed vegetables, sausages not above suspicion, and horrible pies, composed of stale and unripe fruits, whose digestion no human stomach can accomplish, all find ready purchasers.

These decaying animal and vegetable remains are daily entombed in the protuberant stomachs of thousands of children, whose pallid, expressionless faces and shrunken limbs are the familiar attributes of childhood in these localities. They constitute the food of thousands of prematurely-

aged men and women, who seek relief from the poisonous effects of such viands in the more poisonous stimulants which are vended side by side with them. The latter are almost universally used by the population of this district, and, it need scarcely be said, are adulterated to the greatest possible extent. Narcotic poisons take the place of the more expensive alcohol, while mineral acids are often used to give pungency to the beverage. Nor are the other articles of drink sold to the denizens of this quarter more pure or less injurious than the solid food. Milk preserves little more of its original qualities than the color and the name. The "fresh-ground coffee" used here has never been fanned by the breezes of "Araby the blest." It is innocent of the slightest association with swamps of Java or Brazilian plains. It may be interesting to some portions of the public to know something of its history previous to its assuming its status and title as a beverage. It runs somewhat in this wise: That professional chiffonier, the New York ragpicker, derives the emoluments of his calling from several distinct sources. The products extracted from the dubious mines in which he delves, viz., the gutter, the garbage-box, the ash-barrel, &c., are various, having only this in common, that they are all extremely filthy. Thus the textile contents of his bag and basket go to the paper mill and shoddy factory. Bones find their destiny in saponaceous and fertilizing compounds; metallic articles are transferred to the junk shop; and even bits of coal find their appropriate uses. But there still remains a residuum which his professional genius has contrived to make a source of profit. This consists of fragments of bread and other farinacious food, decaying potatoes, cabbages, &c., interspersed with lifeless cats, rats, and puppies, thus introduced to a *post mortem* fellowship. I shall not stop to trace the occasional metamorphosis of the latter into the familiar sausage, but proceed to state that much of the above miscellaneous collection is supplied to certain sailors' boarding-houses, and enters into the composition of bread puddings, and of a sort of "'long-shore lobscouse" which Jack loves "not wisely but too well."

There is, however, a *debris* of material too thoroughly saturated with street-mire to be considered savory, even in the above compound; but this is by no means destined to be wasted. It is sold to the manufacturers of cheap coffee. It is dessicated, partially carbonized, mingled with a small proportion of chickory, &c., ground, and is ready to fulfil its destiny.

Some of my professional brethren who have a down-town practice, when belated in the vicinity of Chatham Street, may possibly have sought refreshment in the popular form of "coffee and cakes," at some of the numerous night saloons in that neighborhood, and thus have had an op-

portunity to test the merits of the above-described beverage. If so, the uproar into which the digestive organs were subsequently thrown, doubtless left a lasting impression on the memory.

JUNK SHOPS AND PESTILENCE.—I have noted about 80 junk shops and second-hand stores in this district. They not unfrequently become sources whence infectious disease is disseminated. The articles of wearing apparel exposed for sale at stores of this class are occasionally brought from the most pestilental localities.

It too often happens that on the recovery, removal, or death of a patient ill of small-pox or typhus fever, all the clothing used about his person is disposed of to the first itinerant dealer that calls, and thus finds its way, saturated with contagion, to these establishments. Through these reprehensible practices variolous disease is doubtless spread far and wide. Nor is the business of first-class clothing houses carried on without occasionally endangering the health of those who patronize them. In localities where small-pox prevailed I found, in some instances within a few feet of the patients, tailors at work for our best clothing establishments.

Such infected vestments—worse than the tunic of the Centaur—bring disease and death not only to the wearer but to many others. The occupant of the crowded tenant-house procures from such a source a coat or a blanket, and soon a loathsome pest attacks the young and unprotected members of his family, and ultimately spreads through the entire quarter, destroying life after life and endangering the health of a large community. Small-pox, suddenly breaking out in some secluded rural district, often owes its unsuspected origin to the above causes. In the remote solitude of the ocean the seaman opens the chest in which he has deposited such obnoxious apparel, and from this Pandora's box scatters the seeds of pestilence among his comrades, which, ripening, shall spread its germs to distant ports.

STABLES.—There are 47 stables in this district. About one-fourth of the number are large, designed for from 10 to 20 horses each. The remainder are small, many of them being mere shanties in the rear of tenement or other buildings, and completely destitute of any means of drainage. The manure is either allowed to remain on the floors, or is deposited in receptacles beneath, whence it is removed at intervals.

The noxious gases arising from these places contribute in no small degree toward vitiating the atmosphere of the crowded tenements by which they are usually surrounded.

A reference to the large map accompanying this report will show that many of the localities where the existence of typhus or typhoid fever is

indicated are in the immediate vicinity of stables, the emanations from which appear to be predisposing if not exciting causes of several forms of zymotic disease.

Influence of Stables upon Diseases.—Of 44 cases of erysipelas occuring during the past year no less than 31 were adjacent to or within twenty-five feet of stables. At No. 10 ——— Street, which is contiguous to one of the largest stables in this district, four cases of this affection occurred. The rear of No. 27 ——— Street adjoins a stable, and is within twenty feet of another. In this house, which is occupied by five families, there were three cases of erysipelas. The rear of No. 22 Cherry Street, which contains sixteen families, is separated from a large stable by a vacant lot, into which runs much of the fluid part of the manure. In this house five cases of the above disease were reported during the year.

Zymotic affections of the throat and lungs appear to be very prevalent in those localities where the litter of stables is undergoing fermentation. One of my colleagues has already stated to the Council his belief that gaseous emanations from these sources are conducive to the spread of diphtheria; and, while my own observations tend to confirm his theory, I believe it to be equally true of an insidious and very fatal form of pneumonia. I am not prepared to assert that these diseases are spontaneously generated under the influence of these causes, but I do not doubt that by their continued action the mucous membrane of the air-passages is brought into a condition which renders it highly receptive of morbid influences. Indeed, it may be said that zymotic diseases of all kinds appear to be exceedingly rife in this region; but I have found it difficult to obtain full and reliable reports of all the pestilential diseases that prevail here. Agents, lessees, and occupants of premises where they occur, are interested in concealing the existence of prevalent maladies, and generally the record of diseases can be ascertained only by searching inquiry. In many instances, too, patients sick of contagious maladies are removed to hospital, thus rendering it impossible without recourse to hospital records to form a correct estimate of the mortality from this cause. In several cases families have been broken up by the successive or simultaneous attack of their members by typhus. This occurred at No. 11 Jacob Street, at Nos. 34 and 38 Cherry Street, at No. 3 Vandewater Street, and at some other places, at each of which places entire families were known to have had fever, but concerning whom no other data could be found.

Accompanying this report is a list of 19 cases of small-pox and 46 cases of typhus and typhoid fever that have recently occurred in tene-

ments I have visited in this district, of which complete or partial histories have been obtained. This list gives the name, age, and residence of each patient, and the date of attack. It embraces less than one-third of the entire number of cases of the above diseases which have occurred in my district during the year.

From this table it appears that of the small-pox patients,

2	resided	in	basement,
3	"	"	1st story,
8	"	"	2d "
2	"	"	3d "
2	"	"	4th "
2	"	"	5th "

Of the typhus and typhoid fever patients,*

5	resided	in	basement,
13	"	"	1st story,
20	"	"	2d "
7	"	"	3d "
1	"	"	4th "

Typhus always appears to diminish during the summer months when the heat forces the inhabitants to throw open their windows, and to use such means of ventilation as are at their command; yet at no time during the past year has this district been entirely free from it. Here those zymoses which depend for their origin on animal effluvia perpetually prevail. Diarrhœa and dysentery are prevalent at all times, though peculiarly so during the summer and autumn. This may be attributed in part to the use of putrescent and indigestible food; but the toxemia resulting from the absorption of concentrated aërial poisons predisposes the system to take on this as well as kindred morbid affections from the slightest exciting causes.

Pulmonary Phthisis.—Under the prostrating agencies ever at work in the abodes of the poor, pulmonary consumption is developed with fearful rapidity; nor to such depressing influences alone are due its wide-spread

* Of the typhus and typhoid fever patients whose age was ascertained, it was less than twelve years in about sixty per cent. of the cases. It will thus be seen that an exceedingly large proportion of children are attacked by these maladies. I think it shows conclusively the activity and virulence of the causes that produce these diseases that they seize so many persons at the outset of life, who, were the febrifacient poison more diluted and consequently slower in its action, would not become the subjects of these morbid agencies until a far later period. It must be remarked, however, that the cases here reported constitute but a small proportion of the total number of fever cases that have occurred in this district during the year.

ravages. The dust and smoke which constantly pervade their apartments keep the delicate tissues of the air-passages in a state of perpetual irritation, which disposes them to take on disease from causes which would otherwise be harmless or inert.

INFANTILE DISEASE AND MORTALITY.—But it is on the tender and susceptible frames of infants that the effects of these influences are most speedily and strikingly manifested. Like the fabled vampires, marasmus and its kindred diseases here hover about the pillow of childhood, sipping from the dewy springs of life till life itself is gone. On the walls of these living tombs DEATH hastens to inscribe the names of more than half of those whose hapless fate it is to be born within their dismal precincts.

The evils attendant upon a residence in crowded localities are not always manifested in distinct forms of disease. There is a tenant-house cachexy well known to such medical men as have a practical acquaintance with these abodes; nor does it affect alone the physical condition of their inmates. It has its moral prototype in an ochlesis of vice—a contagious depravity, to whose malign influence the youthful survivors of the terrible physical evils to which their infancy is exposed, are sure to succumb.

As pertinent to this subject I quote a paragraph or two from my report on "Gotham Court," before mentioned:

"We often find in persons of less than middle age who have long occupied such confined and filthy premises, a morbid condition of the system unknown elsewhere. The eye becomes bleared, the senses blunted, the limbs shrunken and tremulous, the secretions exceedingly offensive.

"There is a state of premature decay. In this condition of life the ties of nature seem to be unloosed. Maternal instinct and filial affection seem to participate in the general decay of soul and body. A kind Providence, whose hand is visible even here, mercifully provides that the almost inevitable decay and death which man's criminal neglect entails on the offspring of the unfortunates who dwell in these dreary mansions, shall elicit comparatively feeble pangs of parental anguish.

"To the physical and moral degradation, the blight of these miserable abodes, where decay reigns supreme over habitation and inhabitant alike, may be plainly traced much of the immorality and crime which prevail among us. The established truth, that, as the corporeal frame deteriorates, man's spiritual nature is liable also to degenerate, receives its apt illustration here."

The Tenant-House Rot.—The state of physical, mental, and moral decline to which I have adverted, is so well recognized and its causes so well understood, that it has received a name, less elegant than expressive; it is called the TENANT-HOUSE ROT.

Under such influences are reared to-day a large proportion of the future citizens of New York, who will control its social and political destinies. Under such influences have been reared a large class, already so numerous as at times to seriously disturb the public peace and to endanger the safety of our social and political fabric.

The terrible elements of society we saw brought to the surface during a great popular outbreak, are equally in existence at the present moment; nay, more, they are increasing year by year. The tocsin which next summons them from their dark and noisome haunts may be the prelude to a scene of universal pillage, slaughter, and destruction. We must reap that which we sow. Pestilence and crime are fungi of hideous growth, which spring up side by side from such pollution as we allow to rankle in our midst.

REPORT

OF THE

FIFTH SANITARY INSPECTION DISTRICT. [SECTION A.]

E. B. WARNER, M. D.,
Sanitary Inspector.

BOUNDARIES.—*North by West Houston Street, south by Spring Street, east by Broadway, west by the Hudson River.*

TOPOGRAPHY.—The natural water-sheds of the original or primitive formation of the surface in this portion of the city, can be readily traced at the present time. The main feature of the topography of the district consisted in two hills; the principal one, known as Richmond Hill, had its highest elevation about Varick Street, its descent in a westerly direction was toward the river, and in an easterly direction toward Thompson Street. The highest elevation of the other hill was about Wooster Street, with a descent also toward Thompson Street, forming in this way a ravine in the neighborhood of Thompson Street, and draining the hills, and carrying the water into what was then known as the Collect. This gives us the key to the natural drainage of the district; the portion lying between Broadway and Thompson Street, and Macdougal and Thompson Streets, is at the present time drained by a sewer which extends through Thompson to Canal Street; thence by the Canal Street sewer to the river. The remaining portion of the district, which extends from Macdougal Street to the western limit, has a natural inclination toward the river, thus forming an excellent water-shed in that direction. The sewerage of this district might therefore be maintained with little expense and labor in a very perfect condition. The projectors of the sewers have apparently followed the inclinations indicated by the natural conformation of the district. A noticeable defect is seen in the culverts, which are not free from the more solid portions of the refuse carried into them after heavy rains. The remedy consists in the removal of the overflow stone and the free use

of the Croton-water, so that the culvert and sewer may be thoroughly washed out each day. In this manner one of the most fruitful sources of malarious and enteric diseases in the city would be removed.

STREETS.—The streets have an average width of about 35 feet, and they run at right angles with each other; they are all paved with cobble stones, with the exception of Broadway and Greenwich Street; the curbs and gutters generally are in good condition, and the surface well drained. All the streets of this district are furnished with sewers with the exception of a small portion of West Houston Street; and such of the outlets as empty into the Hudson River are below high-water mark.

SQUARES.—The number of squares in the district is 33; the majority of them are in a mixed sanitary condition; the great majority of the inhabitants are cartmen, mechanics, and laborers.

INHABITANTS.—It is less thickly populated toward Broadway, but more so from Macdougal Street to the river; that portion of the district west of Varick Street is the most densely settled. There are a few negroes, but the Irish and Germans comprise the larger part.

BUILDINGS.—By reference to the accompanying tabular statement, the entire number of dwellings in the district is 1,503.

Of these 1,170 are brick dwellings, front.
" 122 are frame dwellings, front.
" 147 are brick dwellings, rear.
" 64 are frame dwellings, rear.

There are, therefore, 1,292 front dwellings, and 211 rear dwellings.

There are 120 liquor stores, and 78 groceries in which liquor is sold in this district. Most of the dwellings date from a period antecedent to the introduction of the Croton-water. The more modern improvements have generally been added with supply of water.

A large number of so-called private dwellings are occupied by keepers of brothels and assignation houses. There are 108 in the district. These dwellings are generally in a cleanly condition both externally and internally.*

A very large proportion of the dwellings belong to the class designated "tenant-houses." These tenements are universally unclean and offensive with the emanations from the decomposing refuse which surround and permeate the apartments of the poor. To the want of proper facilities for cleanliness are added the objectionable personal habits of the people themselves. We refer here to that portion bounded by West Houston and Charlton Streets and by Varick and Greenwich Streets.

* The explanation is that these establishments in this district are of the most respectable class, being in the vicinity of the great hotels and the places of public amusement.

There are many of the worst class of tenant-houses in this district. The contractors and proprietors have evidently had but one object in view, viz., to obtain the largest amount of income with the least possible expenditure. As these dwellings were designed for a very poor class of the population, this end could only be accomplished by covering the lots of ground with the largest possible buildings, and divide them into the largest number of rooms. We generally find a front and a rear building, separated by a narrow common court; the rear building is reached by a narrow and filthy alley-way. The halls and stairways of these buildings are generally narrowed as much as possible, without being sufficiently lighted by windows, and are consequently badly ventilated. Indeed, no air circulates here, except what enters at the open door below, and frequently it escapes only through the open hatchway above. On each floor of many of these houses are four families, each family confined to a common room 11 × 14, having an average of about 6 persons to a family. In each building of 5 stories, therefore, there is an average of 20 families of 120 persons. The sleeping apartments are generally much smaller than the common sitting-room, very often having no window, or a window that opens into the hall; the sleeping room is about 8 × 10 feet. Very many who occupy this class of houses are of careless and filthy habits, taking no concern for the general comfort or neatness of their apartments; sleeping and eating together in their ill-ventilated and crowded apartments; disposing of their slops and garbage so as to save themselves from personal exertion, as much as possible, with very few facilities to aid them; employing their ill-trained, ill-conditioned children in these household labors of carrying water and slops through the dark passage-ways, and up and down rickety stairs. It is but fair to presume, that as the masses are improved in their education, and their general intelligence brought into play, more rapid advances will be made in the diffusion and thorough comprehension of the benefits of sanitary science.

It is patent to every sanitary observer that the chief difficulty lies with the poorer classes of the foreign population, and this generally disappears in the second or third generation.

Diseases.—There has been small-pox in the square bounded by Spring, Prince, Thompson, and Sullivan Streets; about twenty cases occurring during the months of September and October. At the present time there are twelve cases, some of which are very severe. This disease also made its appearance about three months since in the square bounded by Varick, Hudson, King, and Charlton Streets; I have reported twelve cases from this locality, and learn that it is still prevalent in this portion

of the district. Its most probable source was an emigrant family which occupied apartments in the rear of No. 74 King Street. Sickness broke out among the members shortly after their coming from shipboard. They were all removed to Ward's Island, suffering, it was stated, with typhus fever.

Remedial Measures.—So long as the authorities do not regulate the dwellings of the laboring classes by compulsory laws, binding equally the proprietors and tenants to the observance of proper internal and external domiciliary arrangements, so long will the sanitary advantages which nature has lavished upon this metropolis be entirely nullified. They should enforce a proper system of tenant-house construction, and not permit the poorer classes to be subjected to the caprice and avarice of the landlords. And it is equally important that the occupants of these houses should not be allowed to vitiate sanitary regulations, by negligence or gross carelessness. The authorities should also enforce the proper cleaning of the public thoroughfares, and the by-ways and alleys, lanes, &c., and the daily removal of all the garbage. These two reforms are the great essentials of civic healthfulness.

Statistical Recapitulation of Buildings (5th District).

STREETS.	Front Brick Dwellings.	Front Frame Dwellings.	Rear Brick Dwellings.	Rear Frame Dwellings.	Liquor Stores.	Grocery and Liquors.	Miscellaneous Stores.	Houses of Assignation and Prostitution.	Stables.	Oyster Saloons, Fish and Meat Markets.	Factories.	Churches.	Junk Shops.
Spring Street, ...	86	6	3	2	16	9	56	5	9	2	4	0	0
Prince Street, ...	85	6	3	2	11	9	26	7	9	1	4	0	0
W. Houston Street,	106	2	10	8	11	4	28	8	6	2	1	0	2
Vandam Street,...	78	15	8	9	3	1	4	0	6	1	3	0	0
Charlton Street,...	105	8	29	15	5	2	14	0	3	0	3	0	0
King Street,.....	77	8	8	2	3	9	9	0	7	0	8	1	1
Broadway,.....	40	0	0	0	5	0	39	0	0	3	0	0	0
Mercer Street,.....	35	1	6	1	8	0	10	31	7	7	9	0	0
Greene Street, ...	28	6	8	2	5	1	5	34	2	1	2	0	0
Wooster Street,...	50	1	7	7	5	3	15	13	0	1	4	0	0
Laurens Street,....	50	12	14	7	1	4	20	5	15	1	4	0	0
Thompson Street,..	54	3	11	2	0	3	9	2	27	5	5	2	1
Sullivan Street,....	50	5	14	5	2	7	7	2	5	2	0	2	0
Macdougal Street,.	47	11	8	2	1	4	11	1	31	0	2	1	0
Congress Street,...	5	0	6	0	0	1	0	0	14	0	2	0	0
Varick Street,.....	76	19	5	0	5	7	26	0	14	6	8	0	0
Hudson Street,....	70	13	0	0	10	3	56	0	0	2	2	0	0
Greenwich Street,..	59	5	5	0	12	5	19	0	3	2	2	0	1
Washington Street,	44	1	2	0	5	2	18	0	9	0	3	0	1
West Street,.....	25	0	0	0	12	5	19	0	0	0	0	0	3
Total,.....	1170	122	147	64	120	78	381	108	167	40	64	6	9

REPORT

OF THE

FIFTH SANITARY INSPECTION DISTRICT. [SECTION B.]

J. W. PURDY, M. D.,
Sanitary Inspector.

BOUNDARIES.—*North by Christopher Street, east by Sixth Avenue, south by Houston Street, west by the North River.*

TOPOGRAPHY.—This district is level, and so far as can be ascertained there is very little made ground; the soil is sandy or gravelly.

STREETS.—The streets are very irregular in their course, but approximate north and south, east and west. They are about 30 feet in width, and are paved with cobble stone, except Sixth Avenue, Bleecker Street, and Greenwich Street, which are Belgian. The surface of the streets is generally irregular or uneven, especially in West Street. The gutters, as a rule, are in good order, though in some places they are broken, leaving holes in which water, often slimy, stands until evaporated or washed away by the next rain.

SEWERS.—This district is pretty thoroughly sewered, every street but one having a sewer in some portion of it; their outlets are above low tide.

SQUARES.—There are forty-two squares in the district, divided as to their sanitary condition about equally into good, bad, and mixed.

INHABITANTS.—A large proportion of the inhabitants of the district are of the laboring classes, the remainder are storekeepers, clerks, and merchants.

BUILDINGS.—The total number of buildings in the district is 1,574, of which number 1,146 are private dwellings, and 185 are tenant-houses; there are 476 stores and 12 saloons; 63 manufactories of various kinds; 4 slaughter houses, and 8 churches.

PRIVATE RESIDENCES.—The private residences are generally old-

fashioned two and three story houses, with good water supply; the sinks are generally in the yard, and for the most part they are connected with the street sewer. The material used in the construction of 16 is wood, and of 1,130 brick.

Tenant-Houses.—The tenant-houses are, with few exceptions, old buildings, originally private dwellings, in which are now crowded from four to six families, averaging five persons each. The greater number have water in the yard, court, or alley; the sinks in nine-tenths are in the yard, and in a filthy condition; the garbage and slops are deposited in the street. Ventilation is principally by doors and windows, generally poor and inadequate. The apartments are heated by stoves, which are often left with the covers off, and emit large quantities of gas. But few of the cellars are occupied in the district, but in those few the occupants have suffered from rheumatism and ophthalmia, diarrhœa, dysentery, and typhoid fever. They are dark, damp, close, and offensive. There are a few exceptions to this rule, as follows:—One in the rear of No. 9 Carmine Street, a four-story house, with large airy rooms, plenty of light, good ventilation, a large court in front, and a fire escape. The whole building, court, and passages are kept clean and in good order. A second is on the corner of Houston and Greenwich Streets; this is a large house, covering three lots. The material of which the tenant-houses are built is as follows:—143 are of brick, and 42 of wood.

Liquor Stores.—There are 81 liquor stores, groceries with bars attached, saloons, &c., in this district. A few are kept in good order, and are quiet; but by far the larger number are small, dark sinks of vice and iniquity. In Greenwich, Washington, and West Streets are found the examples of this latter class in full perfection.

Stores.—There are 476 buildings for stores of different kinds. The small groceries rank first in insalubrity; the majority of them are filled or surrounded with decaying vegetables or fruits, which are thrown out into the gutters or packed in between barrels and boxes, and there lie in sunshine or rain to rot. The probability is that many of our cases of diarrhœa and dysentery, with their consequences, may be traced to this cause.

Factories.—For the manufacture of pianofortes, carriages, furniture, castings, guns, muskets, &c., &c., there are 63 factories.

Slaughter-houses, &c., &c.—There are 4 slaughter-houses, 2 livery stables, and 160 private stables. The slaughter-houses are all kept in good order, the offal is carried away, and the gutters cleaned immediately, and there is no complaint made by the neighbors.

Stables.—These structures are built of brick and wood; the latter

are mostly in a dilapidated, tumble-down condition, and very filthy. Many of those built of brick are kept clean.

CHURCHES, &c., &c.—There are 8 churches, 1 dispensary, 2 banks, 1 asylum or home, and 2 public schools.

PIERS, DOCKS, &c.—The piers, 4 in number, are in very fair condition; the basins need dredging, for at low water they are nearly bare, and in warm weather emit a most intolerable stench from the reeking slime, the dead animals, entrails, &c., which collect in them, and undergo putrefaction during the summer.

DISEASE.—The prevailing diseases during the past season have been typhoid fever, dysentery, diarrhœa, scarlet fever, measles, and a few cases of variola. There are many insalubrious quarters where the prevalence of pestilential diseases was to have been anticipated, but the season passed without their appearance to any great extent.

Statistical Recapitulation of Buildings (5th District).

Total number of dwelling-houses in the district, 1,331.

One hundred and eighty-five tenant-houses, of which 42 are wood, 143 brick.

Four hundred and seventy-six stores.

Eighty-one rum shops

There are one hundred and sixty stables and two livery.

Four slaughter-houses, one on Jay Street, one on Cornelia Street, two on Barrow Street.

Eight churches.

Two public schools.

One Dispensary (Northern).

One Home (St. Luke's).

Two banks.

One insurance office.

Sixty-three factories.

Twelve markets.

One hundred and twenty-five rear houses.

One hundred and fifty-seven wooden houses.

Fourteen hundred and seventeen brick houses.

The total number of buildings of all descriptions, 1,574.

REPORT

OF THE

SIXTH SANITARY INSPECTION DISTRICT.

WILLIAM F. THOMS, M. D.
Sanitary Inspector.

BOUNDARIES.—*North by Walker and Canal Streets, east by the Bowery, south by Chatham Street and Park Row, west by Broadway. This district comprises the Sixth Ward.*

STATISTICS OF DISTRICT.

Whole number of buildings.	Dwellings.	Stables.	Liquor Stores.	Brothels.	Stores.	Manufactories.	Churches.	Public Schools.	Dispensary.	Arsenal.	Asylums.	Prison.	Railroad Depot.	Parks.	Vacant Lots.
1380	182	43	406	29	528	117	6	3	1	1	4	1	1	2	8

STATISTICS OF TENANT-HOUSES, BASEMENTS, AND CELLARS.

Tenant-houses.	Rear Tenant-houses.	Number of Tenements without Fire-escape.	Number of Tenant-houses not connected with any sewer.	Number of Tenements in good Sanitary condition.	Number of Tenements in faulty Sanitary condition.	Number of Families in Tenant-houses.	Average number of Families to each Tenant-house.	Tenement Population.	Tenement Population with less than 300 cubic feet of air.	Minimum average cubical space to each person in a house on Worth Street.	Average age of Tenement Population.	Cellar Population.	Average cubical space to Cellar Population.
										CUBIC FEET.	YEARS.		FEET.
609	154	302	302	24	585	4400	7¼	23,000	2720	122	23	496	615

STATISTICS OF DISEASE. [INCOMPLETE.]

Statistics of Disease on record since the commencement of this year, 1864 (*for ten months*), *occurring in streets and parts of streets in this District.**

STREETS.	Typhus Fever.	Typhoid Fever.	Fever.	Variola.	Rubeola.	Scarlatina.	Erysipelas.
Mulberry Street,	57	2	35	17	20	6	6
Baxter Street,	40	3	13	3	12	2	5
Park Street,	16	1	11	2	3	2	..
Bayard Street,	8	..	..	..	1	1	..
Pearl Street,	13	..	..	1	..	..	..
Leonard Street,	5	..	2	2	3	..	..
Mott Street,	8	1	4	..	1	..	..
Elm Street,	4	6	1	..	..	..	..
Worth Street,	3	..	1	1	1	..	..
Franklin Street,	2	..	1	1	5	1	..
Canal Street,	1	1	2	..	1	..	..
Centre Street,	3	..	2	2	..	..	..
Mission Place,	3	..	..	..	..	..	..
Doyer Street,	..	1	3	..	1	..	..

STATISTICS OF MORTALITY.

Number of Deaths in 1860.	Maximum.	Minimum.	Number of Deaths in 1861.	Maximum.	Minimum.	Number of Deaths in 1862.	Maximum.	Minimum.	Number of Deaths in 1863.	Maximum.	Minimum.
	AUGUST.	JUNE.		AUGUST.	NOV.		AUGUST.	JUNE.		AUGUST.	JUNE.
963	143	53	1054	129	68	928	126	61	1114	177	78

Statistics of the Ratio of Deaths to the 1,000 *of the Population.*

Ratio of deaths per 1,000 in the Sixth Ward, in the year 1860..... 36
Population to one death in the Sixth Ward, in the year 1860..... 28½
Ratio of deaths per 1,000 in the month of August, in the year 1860..... 5½
Ratio of deaths per 1,000 in the month of June, in the year 1860..... 2
Ratio of deaths per 1,000 in the Sixth Ward, in the year 1861..... 40
Population to one death in the Sixth Ward, in the year 1861..... 25½

* From the New York Dispensary and the Bellevue Hospital Records. This is but a small percentage of the total number of cases of these diseases in this district.

Ratio of deaths per 1,000 in the month of August, in the year 1861	5
Ratio of deaths per 1,000 in the month of November, in the year 1861	2½
Ratio of deaths per 1,000 in the Sixth Ward, in the year 1862	36
Population to one death in the Sixth Ward, in the year 1862	28½
Ratio of deaths per 1,000 in the month of August, in the year 1862	4½
Ratio of deaths per 1,000 in the month of June, in the year 1862	2½
Ratio of deaths per 1,000 in the Sixth Ward, in the year 1863	43
Population to one death in the Sixth Ward, in the year 1863	24
Ratio of deaths per 1,000 in the Sixth Ward, in the month of August, in the year 1863	6½

Standard ratio of deaths to 1,000 in healthy population	17
Population to one death, standard	54
Ratio of deaths per 1,000 in the United States	23
Population to one death in the United States	45

GEOLOGY.—The geology of the Sixth District consists mainly of what is known as diluvium. It is a compound of boulders, gravel, sand, and silicious clay.

TOPOGRAPHY.—A high hill was graded down between where Worth and Canal Streets now intersect Broadway. Its height was from twenty-five to thirty feet above the present level.

On this hill, near where Franklin Street is located, on the east side of Broadway, stood a reservoir, built before the Revolution, for supplying the city with water.

COLLECT.—The largest pond on Manhattan Island was located upon that part of the city which is now included between Baxter and Elm Streets, and between Duane and Canal Streets, in the middle of which section Centre Street now passes.

The Halls of Justice, a prison of Egyptian architecture, vulgarly called the "Tombs," stands near what was once the middle of the *Collect*. The place and appearance of this pond are still in the memory of some venerable citizens of New York. Its peculiar topographical features, the high hill rising abruptly from its sides, the groves upon its borders, the depth and purity of its waters, are things much spoken of in the historical records of New York.

The water of this little lake was of great depth and of unusual purity. One of its principal fountains, afterwards well known as the "Tea-water Spring," supplied ten or twelve thousand inhabitants with water for their favorite beverage.

A sparkling brook carried off its water into the East River, while towards the North River stretched a marsh covering a large extent of land, through which streamlets from this pond made their way.

For more than a hundred years after the settlement of the island by

Europeans, fish were abundant in this pond, and were caught by nets during all that period. Several plans were presented for the permanent regulation of the locality. Among others was one proposition to make a dock, or basin, in the deep water of the *Collect*, as a harbor for shipping, and to communicate with both the North and East Rivers, by means of a canal forty feet in width. It was concluded, however, not to construct a basin, but to fill in the *Collect*, the question of a canal being still left unsettled.

About the year 1800 the work of filling in the *Collect* was commenced, and continued about ten years. The long time occupied in this labor occasioned a serious inconvenience to the neighborhood; and the pond, in place of its originally beautiful appearance, became a nuisance. Dead animals, together with every species of rubbish and offal, were thrown into it, and occasioned an insufferable stench. This, however, was remedied.

At the great undertaking of filling up this pond, a curious fact occurred. The specific gravity of the sand and gravel of the hill was so much greater than that of the mud and sediment of the pond, that in gravitating to the hard bottom it pushed up in its centre several islands of this sediment, which were raised some 8 or 10 feet above the level of the water; and this becoming dry and cracked open, salt was discovered to be present in great abundance. The pond was drained by a canal which extended down Canal Street, and entered the North River at the foot of that street. The old stone bridge on Broadway passed over this canal. For a number of years a ditch ran through Centre Street, but this also was filled up, and all traces of the Collect were obliterated.

Streets.—The streets parallel with the long axis of the island are variously from 36 to 60 feet in width. The streets intersecting these are narrower, and in a equally bad sanitary condition. Most of them are paved with cobble stone, and, with few exceptions, are in a very filthy condition summer and winter; domestic garbage and filth of every kind being thrown into the streets, covering their surface, filling the gutters, obstructing the sewer culverts, and sending forth perennial emanations which must generate pestiferous diseases.

Garbage.—In winter the filth and garbage, etc., accumulate in the streets, to the depth sometimes of two or three feet. The garbage boxes are a perpetual source of nuisance in the streets, filth and offal being thrown all around them, pools of filthy water in many instances remaining in the gutters, and having their source in the garbage boxes.

The streets have been cleaned occasionally this summer; but unless a system is adopted whereby the inhabitants will be prevented from throwing filth and garbage into the streets, cleanliness is impossible.

SEWERAGE.—The streets of this district are generally sewered, but most of the sewers are faulty in construction.

The outlet to those in the upper part of the district is through the Canal Street sewer, which empties into the North River at the foot of that street. The mouth of the sewer is uncovered at low water. The outlet to those in the lower and Chatham Street side of the district, is through the Roosevelt Street sewer, the mouth of which is also uncovered at low water. The culverts at the corners of the streets are often choked up on account of the large amount of filth and garbage thrown into the gutters, and which is carried down into the sewers. The culvert at the corner of Bayard and Baxter Streets is frequently in this condition, and the accumulated filthy water is sometimes allowed to stand several days before an outlet is cleared for it. Typhus fever, diarrhœa, and cholera infantum are the constantly-prevailing diseases in this pestilential locality.

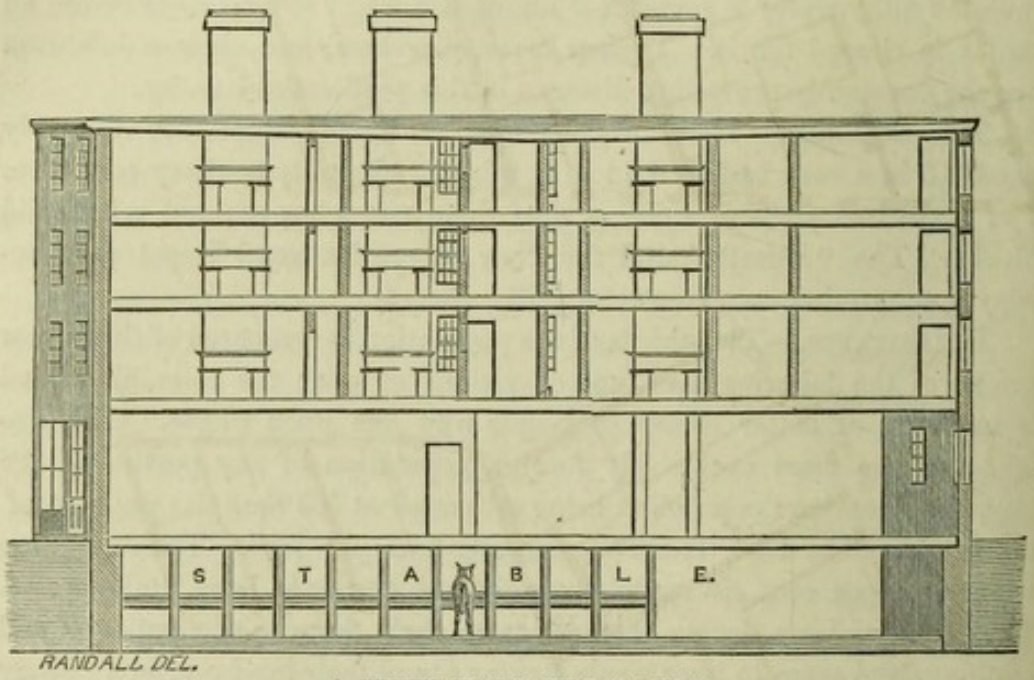
THE SQUARES.—There are 43 squares, 14 of which are tolerably good, 15 in a very bad, and 14 in a mixed and faulty sanitary condition. 7 of them are parts of squares, 6 of them triangles, covered with solid blocks. The "Tombs" and the New Haven Railroad Depot each occupy a square between Centre and Elm Streets.

INHABITANTS.—Two-thirds of the population is composed of the lowest grades of the laboring poor, and of vicious classes; the remaining third is made up of better classes of people who live upon wages. This district has the most exclusively foreign population of any portion of the city, the American population being estimated at *less than five per cent.* of the whole. The Irish constitute seventy-four per cent. The remaining twenty-six per cent. is made up mainly of German Jews, Italians, etc. The German Jews devote themselves to their favorite occupation of old clothing, and seem to have made Baxter Street their headquarters. Many of the Irish keep junk shops, liquor stores, groceries, etc., etc. The Italians are ragpickers, organ grinders, etc., etc.

TENANT-HOUSES.—Many of the tenant-houses are located over what was once the "Collect;" two-thirds of them are very old wooden structures. Some are quite small, containing from 4 to 8 families in as many rooms; others comparatively large, containing from 12 to 15 families. This class of houses is occupied by the lowest grade of inhabitants; many of them are used as lodging-houses, and as many as thirty persons are sometimes packed into one small room. There is one house of this character in Baxter Street, from which a very large number of patients has been sent to the fever hospital, and among which the mortality is very great. About a third of the number of buildings consist of the better class of brick tenant-houses, and contain from 10 to 50 families each.

The *pro rata* of ground-area to each occupant, in many instances, is less than 15 square feet, and the cubical space in the apartments to each occupant is less than 300 feet; and one-half of the tenant-house population have less than 500 cubic feet of air to each person.*

The external and internal ventilation, in many instances, is very imperfect, front and rear buildings being within 8 or 10 feet of each other. Stores, schools, and churches are built the whole length of the lot, obstructing the circulation of air between rows of front and rear houses; tenant-houses surround entirely, or very nearly, small courts; and in many instances the rear buildings of the blocks upon parallel streets are built closely back-to-back, thereby utterly excluding external ventilation.

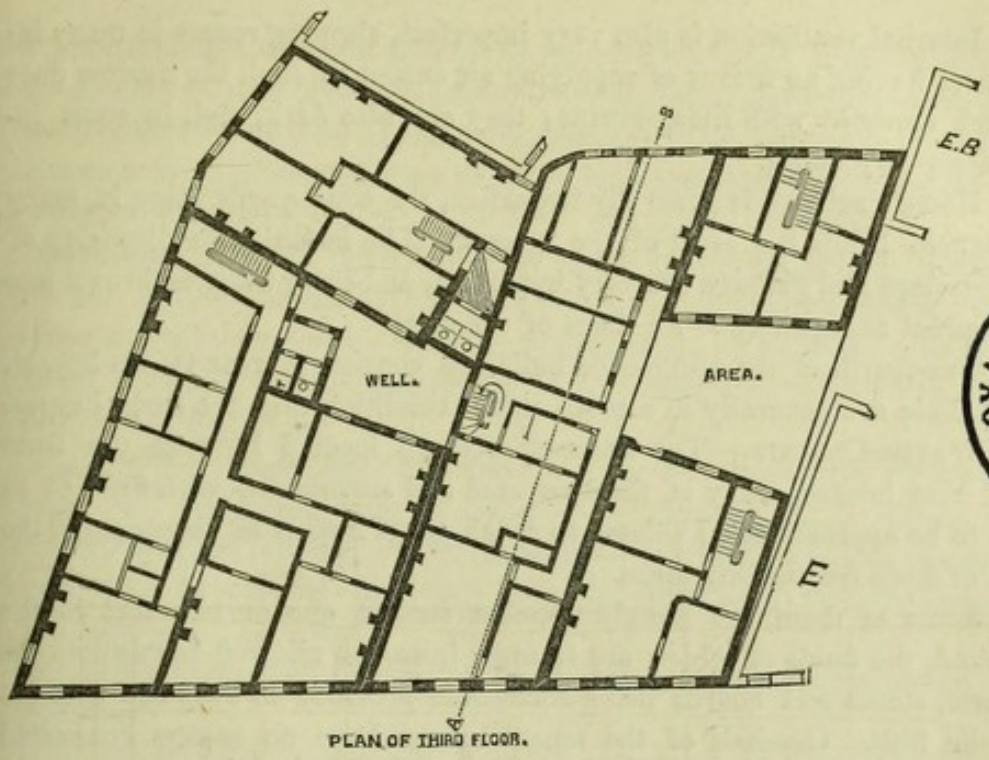


A SIXTH WARD FEVER-NEST.

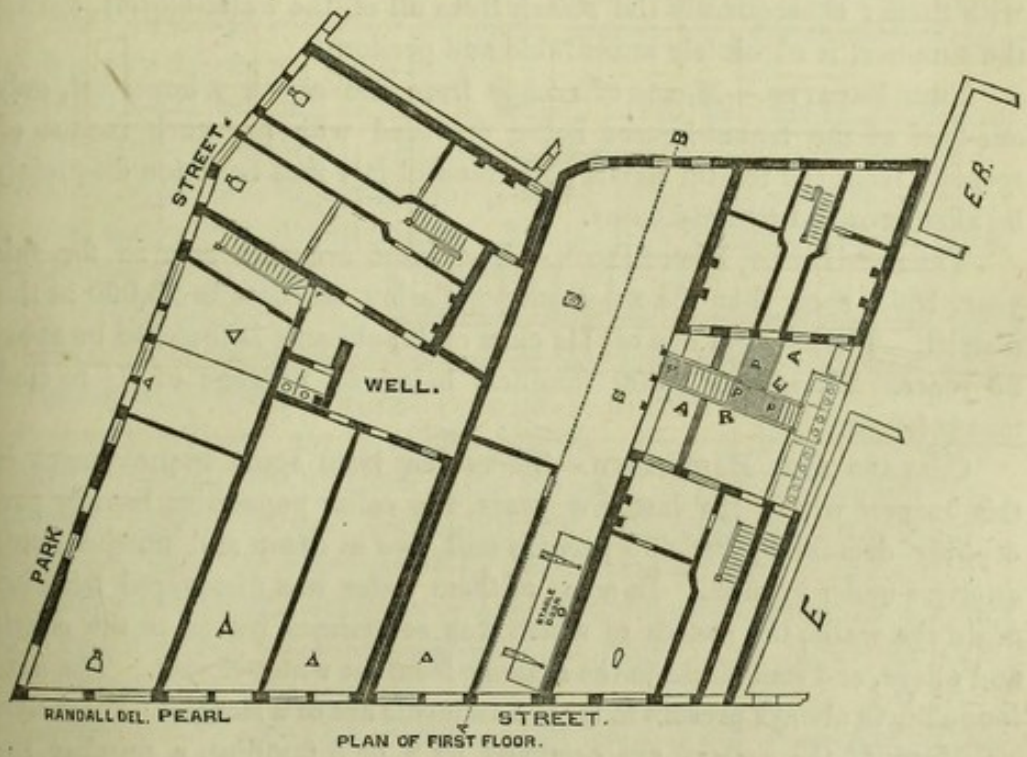
STATISTICS OF MORTALITY.

Number of persons.	Number of families.	Number of deaths.	Rate of deaths per 1000 persons.	Ratio of deaths.	Ratio of sickness.	Number of persons sick.	Ratio of deaths of children under 10 years of age.	Number of children who have died during the year under 10 years.	Number of children under ten years of age.	Cubic feet of air to each person.
349	74	18	53 in 1000	1 in 19½	1 in 3⅛	115	1 in 6	9	54	About 350 by day and 200 by night.

* The above wood-cut presents a sectional view of a fever-nest, as Dr. Harris terms such generators and hot-beds of typhus. Fifteen persons sick with typhus have been conveyed to hospital and elsewhere during the year. Lack of ventilation is the essential fault of the house and its seventy domiciles. Few of the bed-rooms have any



THE ROYAL SANITARY INSTITUTE LIBRARY



A SIXTH WARD FEVER-NEST.

ventilation whatsoever, and nearly half of the other apartments look out exclusively upon dismal and fœtid well-hole areas that are lined by the privies where three hundred and fifty persons attend the calls of nature. Preceding this note is a statistical statement which was taken the day of my last inspection of the place.

Internal ventilation is also very imperfect, sleeping rooms in many instances having no means of supplying air except through the narrow door which connects with living-rooms; they are also dark, and, in some instances, very damp.

House drainage is generally imperfect, the court-yards being in many instances below the level of the streets. The facilities for disposing of house-slops and garbage are very imperfect, and every thing is thrown into the street and gutters at all times of the day.

One-fourth of the number of buildings consists of rear tenant-houses, and these are generally in a much worse condition than the front houses.

Water-Closets.—The water-closets are located between the front and rear houses, many of them covered and surrounded with filth, so as not to be approachable; others so much out of repair as to endanger the life of those frequenting them.

Some of them are merely trenches sunken one or two feet in the ground, the fluids of which are in some instances allowed to run into the courts, stones and boards being sometimes provided to keep the feet out of the filth. One-half of the tenant-houses have no sewers connected with them; consequently the stench from all of the water-closets, during the summer, is absolutely unbearable and perilous.

Fire Escapes.—Means of escape from fire are very imperfect, only one-half of the tenant-houses being provided with any such means of security from the fearful perils and dreadful fate that have too frequently befallen crowded tenant-houses.

Tenant-House Population.—The most accurate returns for this year, 1864, show that the tenement population amounts to 23,000 in this district. The average age of this class of inhabitants is found to be about 23 years. There are 4,400 families, being an average of $7\frac{1}{4}$ to each tenant-house.

Cellars and Basements.—There has been some improvement in this respect within the last few years, the cellar population having perceptibly decreased, yet 496 persons still live in damp and unwholesome quarters under ground. In some of them water was discovered trickling down the walls, the source of which was sometimes traced to the courts and alleys, and sometimes to the soakage from the water-closets. The noxious effluvia always present in these basements are of a sickening character.

Many of the cellars are occupied by 2 or 3 families, a number are also occupied as lodging-houses, accommodating from 20 to 30 lodgers. One near the corner of Elm and Worth Street, is now 15 or 16 feet below the level of the street. (The street having been raised 10 feet.) The lodging-house keeper complained to the Inspector that her business

has fallen off some since the street was raised. As might be expected the sickness rate is very high; rheumatic disease, fevers, strumous diseases, cholera infantum, &c., &c., running riot among the population. Indeed, in nearly every basement disease of some kind has been found peculiarly prevalent and fatal.

Dram-Shops.—406 drinking shops exist in my inspection district. They are of the worst class, producing an immense amount of alcoholic disease, which in very many instances proves fatal. The social evils and personal suffering resulting from the same cause are everywhere witnessed in this district.

Brothels.—There are 29 brothels. They are the source of much sickness and death, the inmates being of the lowest class. Those in tenant-houses have not been enumerated in this estimation of the number of brothels. Prostitution has long been the most open and shameless of vices in the Sixth Ward.

Stores.—528 stores, drug shops, groceries, and markets, are found in my district.

Factories.—There are 117 factories, consisting of type, lead pipe, shot, iron, sugar and confectionery, brass, pewter, box, stoves, pianoforte, &c., &c., in a fair sanitary condition.

Stables.—There are 43 stables, which, owing to their location, are prolific sources of disease; some are located in the basement of tenant-houses, causing them to become fever-nests; others are situated between the front and rear of tenant-houses. The manure heaps connected with these stables are generally in a neglected condition.

Churches—There are 6 churches. One of them obstructs the external ventilation of the tenant-houses on City Hall Place. These church edifices are badly ventilated.

Schools.—There are 3 public schools. One is in a very faulty sanitary condition, 600 children being crowded on one floor that is very imperfectly lighted and unfit for the purpose. No playground is provided. The other schools are surrounded by tenant-houses; one of them interferes with the external ventilation of a large number of high tenant-houses in the neighborhood ; 4 other schools exist, which come under the head Charitable Institutions.

Dispensaries and Charities.—The New York Dispensary, the oldest and most important medical institution of the kind in America, is located in this district, on the corner of Centre and White Streets. Nearly *fifty thousand sick poor* are annually treated in this noble institution, and, like the other dispensaries of the city, it furnishes the benefits of vaccination gratuitously to thousands of persons every year. There

are four other charitable institutions in the district. They are devoted to the care of poor children; these institutions are in good sanitary condition. In two of them much sickness has prevailed from time to time, occurring every one or two years; they are located on the spot that was once the "Collect," and are in close proximity to the great fever-nests and most insalubrious quarters of the city.

THE "TOMBS."—This famous penal institution is located on made ground, over what was once the centre of the Collect; it is in good sanitary condition. Between 41,000 and 42,000 persons pass through it to the various public institutions in the course of a year.

BURYING GROUNDS AND VACANT LOTS.—A negro burying ground formerly existed between Duane and Worth Streets; it is now 40 feet below the level of the street. There are eight vacant lots occupied as coal yards, storage for lumber, &c., &c., in fair sanitary condition.

PREVAILING DISEASES.—The following list and number of cases of severe sickness in this small district have been treated from the New York Dispensary or sent to hospital: 253 cases of fever, 29 cases of small-pox, and 48 cases of measles. These were all charity patients, and they indicate the prevailing diseases of the locality.

A large number of insalubrious quarters exist in this district, and in them the constant-sickness rate is large. During the summer months much diarrhœa, dysentery, and cholera infantum prevailed, but I have not had time to glean statements and collect statistics.

Purulent ophthalmia continually exists in this district; in a tenant-house on Leonard Street the Inspector has seen 17 cases recently. Several cases of typhus have occurred in the houses on Mission Place, the origin of which could be traced to recent immigrants.

The increase in the number of deaths for 1863 can be accounted for in two ways: First. By an increase in the number of febrile diseases occurring during that year. Second. By an increase in the number of the very lowest class of people who have come to reside in this ward from other wards; the more respectable of this low class having removed out of this district. The mortality among children is fearfully high, many families having lost all of their children; others 4 out of 5 or 6. The proportion of still-births, also, is almost unparalleled.

REMEDIAL MEASURES.—The sewerage of my district needs to be greatly improved. The accumulation of sewage, the return flow of sewer gases, and the obstruction of house-drains and local sewers, must be provided against; the culverts, the gutters, and the pavements require vigilant and skilful care, and all sources and conditions of local filth should be under the surveillance of faithful and fearless sanitary officials.

Popular Education.—Some method should be adopted to educate the people in sanitary matters, by printed and other instructions suitable for the purpose; and I would suggest that the assistance of all the clergy, the charitable institutions, and the benevolent ladies of New York, be sought to aid in teaching the unfortunate inmates of these abodes of poverty, the duties of life, by a system of domiciliary visitation, and advice in regard to their domestic welfare and sanitary condition. This system has been carried out in the poor districts of London with great success, and is one reason why the mortality in that great city is less than in the general average of country towns in England.

Tenant-Houses.—A law should be enacted to regulate the construction, and external and internal ventilation of these buildings; an Inspector being appointed to regulate this matter the same as in the case of unsafe buildings.

Those already constructed to be put in the best sanitary condition, by arranging ventilators and skylights over the stairways on the roof, making tin or iron flues connecting with every sleeping-room; the flues extending from the basement to the roof of the house. This improvement could be easily made without much expense.

Dram-Shops.—As no law can stop the sale of liquor, a law should be enacted to regulate it. Any liquor-dealer selling or giving liquor to a person partially under its influence should be fined.

Institutions should be provided for those who are in the habit of using it to excess; and all who are in this condition, no matter what their position, when found in the streets should be sent to them, and if necessary retained there.

Brothels.—As no law can prevent them, laws should be enacted to control them, by imposing a fine, when disease is found among them. This would prevent one-half of the diseases arising therefrom.

Small-Pox.—This disease, as we all know, can be almost entirely prevented by vaccination. Nearly all the cases that now occur are among young children who have not been vaccinated on account of the ignorance, superstition, or neglect of the parents.

Typhus.—This disease can be controlled, if not entirely eradicated, by proper sanitary measures. The filthy streets, courts, alleys, water-closets, and cesspools, should be cleaned, and the filth removed, sunken courts filled up, obstructed external ventilation also removed, internal ventilation improved by flues in every sleeping-room, ventilators and skylights to be placed over the stairways in every house. And to stop the progress or annihilate the virus of typhus in the tenant-houses of the city, there must be some limitation to the crowding and packing of given areas, and

domiciliary apartments must be in some way limited by sanitary regulations.

Epidemics and Local Causes.—The seeds of disease exist everywhere in the Sixth District; and although removable and susceptible of sanitary control, they are yet uncontrolled, and at any time may spring into activity and a terrific life that shall only have the power and effect of death. Cholera, when it visits these shores again, will first break forth here *if proper sanitary measures be neglected*. The first appearance of cholera in the great epidemic of 1849, in this city, was in the houses Nos. 21 and 23 Baxter Street; it then spread to Nos. 8 and 10 Mulberry Street, and from thence to all parts of the city.

Typhus fever-nests exist in all parts of this district; and it has been traced from these nests to every ward in the city, spreading the disease not only in the worst localities, but into the homes of the industrious, the wealthy, and the highest classes of society. This disease is now on the increase, and if proper sanitary measures are not adopted to remove the predisposing and the infecting causes, we may again have an epidemic of that scourge.

REPORT

OF THE

SEVENTH SANITARY INSPECTION DISTRICT.

P. NOLAN, M.D.,
Sanitary Inspector.

BOUNDARIES.—*This district is bounded on the north by Houston Street, west by Broadway, south by Canal and Walker Streets, and on the east by the Bowery. It comprises the Fourteenth Ward.*

TOPOGRAPHY.—The Fourteenth Ward has its principal descent southward toward Canal Street, with a considerable elevation at its southeastern section. It is all original ground of a clay and gravel composition.

The streets are nearly all sewered, and enter the mains, either directly or indirectly, running through Canal Street. The streets run north and south, east and west, are of good width, and paved—some with cobble stone, others with Belgian pavement—all being in good order as regards the condition of the pavement. The gutters and surface of the streets are generally filthy, and the odor arising therefrom very offensive, especially in those running north and south, which are most dirty.

SQUARES.—There are 43 squares in the Seventh District, one-fourth of which are in a good, one-half in a fair, and one-fourth in a very bad sanitary condition. The causes which tend to this insalubrious condition are apparent and numerous. They consist of slaughter-pens, crowded buildings, neglected privies, filthy streets and gutters, and a general want of domiciliary cleanliness.

POPULATION.—One-half the inhabitants are of the lower order, and have little regard for cleanliness. They live by their daily labor or keep small shops. They are mostly Irish and German, the former nationality predominating.

BUILDINGS.—About one-half of the buildings in this district are tene-

ments, many of these having stores underneath; a small portion are private dwellings, and a considerable number are manufactories of different kinds, such as iron, glass, soap and candles, sewing machines, carriage, cabinet and the various fabrics of wood.

The few *private dwellings* in the ward are brick houses of two and four stories high, well built, and with large and airy rooms, good water-supply and drainage, and lighted with gas. They are generally in good condition. The privies to these residences are in the yards, and are kept in a fair state of cleanliness.

Nearly all the larger class of brick tenant-houses are comparatively new, and have a good supply of water. The garbage is either thrown in boxes on the sidewalk, or, which is more common, upon the pavement.

The water-closets are nearly all in the yards—but few being in the houses—and connecting with the sewers. The greater number of these privies are in a filthy condition, being but seldom emptied. Many of those which communicate with the sewers are choked up by all sorts of offal being thrown into them, thereby producing a very bad condition. As a general rule each family has a room and one or two small bedrooms, the size of which diminish from the lower floors upward. The lower rooms are usually from 10×12, to 12×15, and 12×18 feet, the latter being considered a large room. The upper rooms are often as small as 8×12 feet, and the dormitories but 6×10 feet square. The bedrooms are usually only large enough to hold an ordinary-sized bed and one or two chairs.

The old wooden houses have more space, but they are more filthy. They are the dilapidated private residences of an earlier generation. The present occupants are poor and ignorant, with fixed habits of uncleanliness.

There are at least 260 liquor shops and drinking saloons in the ward.

The number of houses of prostitution may be estimated at 40.

One-half of the buildings in the district have stores and little shops of various kinds in them. There are eight drug stores, and one market, viz.: "Centre Market."

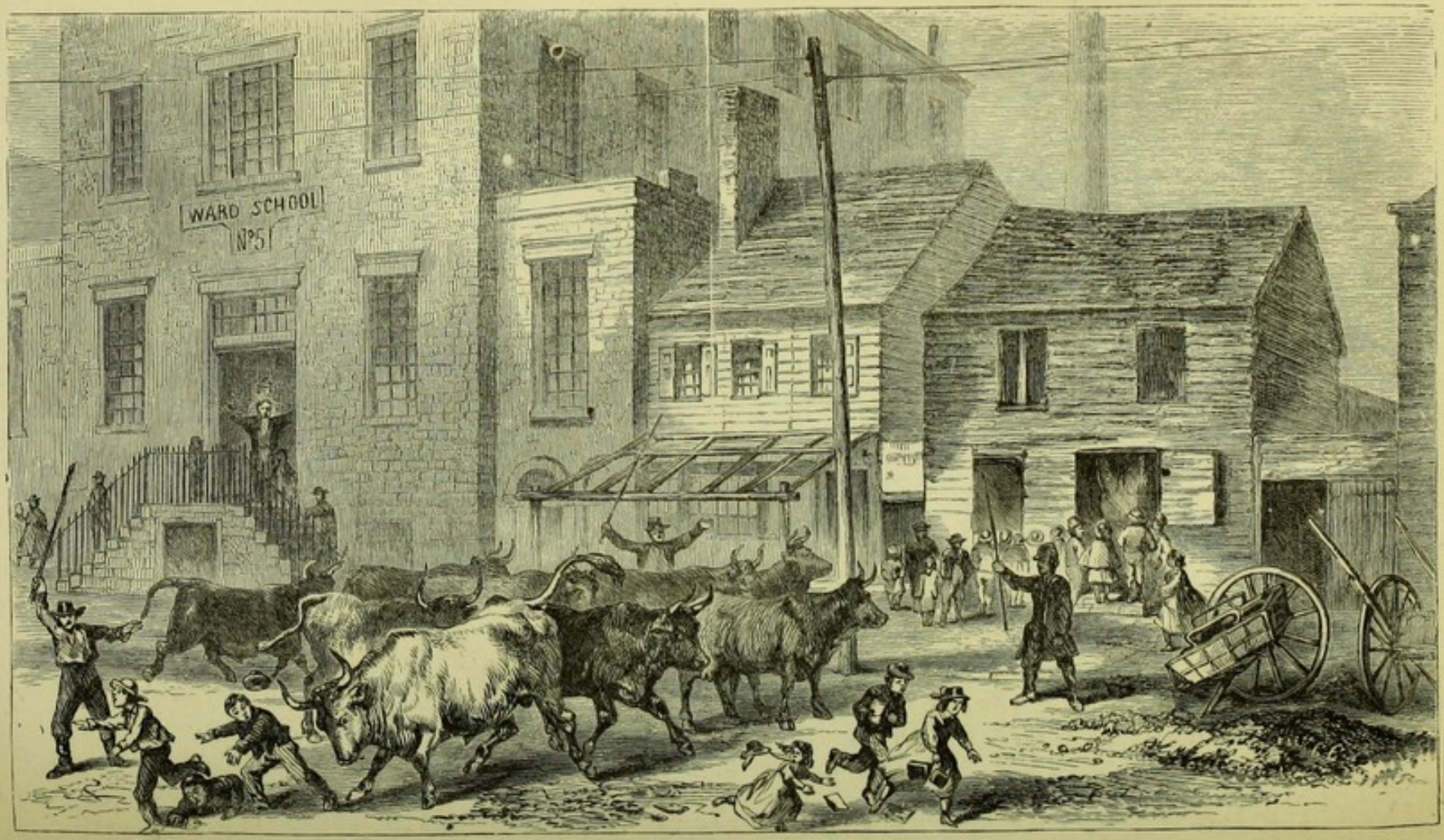
Slaughter-Houses.—There are six large slaughter establishments in the ward, all of which are necessarily very filthy, and, of course, injurious to the public health, owing to the large collections of offal which is allowed to accumulate before its removal, and which is constantly undergoing decomposition; also the continued flow of blood, and with urine and fæcal matters into the gutters, commingling with the refuse of the streets, have a most deleterious effect on the atmosphere.

Fat-Boiling, &c.—There are 3 very large fat-boiling establishments

THE ROYAL SOCIETY
OF HEALTH
LIBRARY

Formerly

THE ROYAL SANITARY INSTITUTE
LIBRARY



A PUBLIC SCHOOL, AND ONE OF THE SLAUGHTER-PENS IN THE FOURTEENTH WARD.

in the ward, and a small or private one. The contamination of the atmosphere from this cause alone is very great, as the emanations are perceptible at a great distance in every direction. The slaughter and the fat-boiling establishments are in close proximity to one of the largest business thoroughfares in the city, viz.: the Bowery; and not only have a very unhealthy influence on the residents of that neighborhood, but are injurious to the interests of the business community.

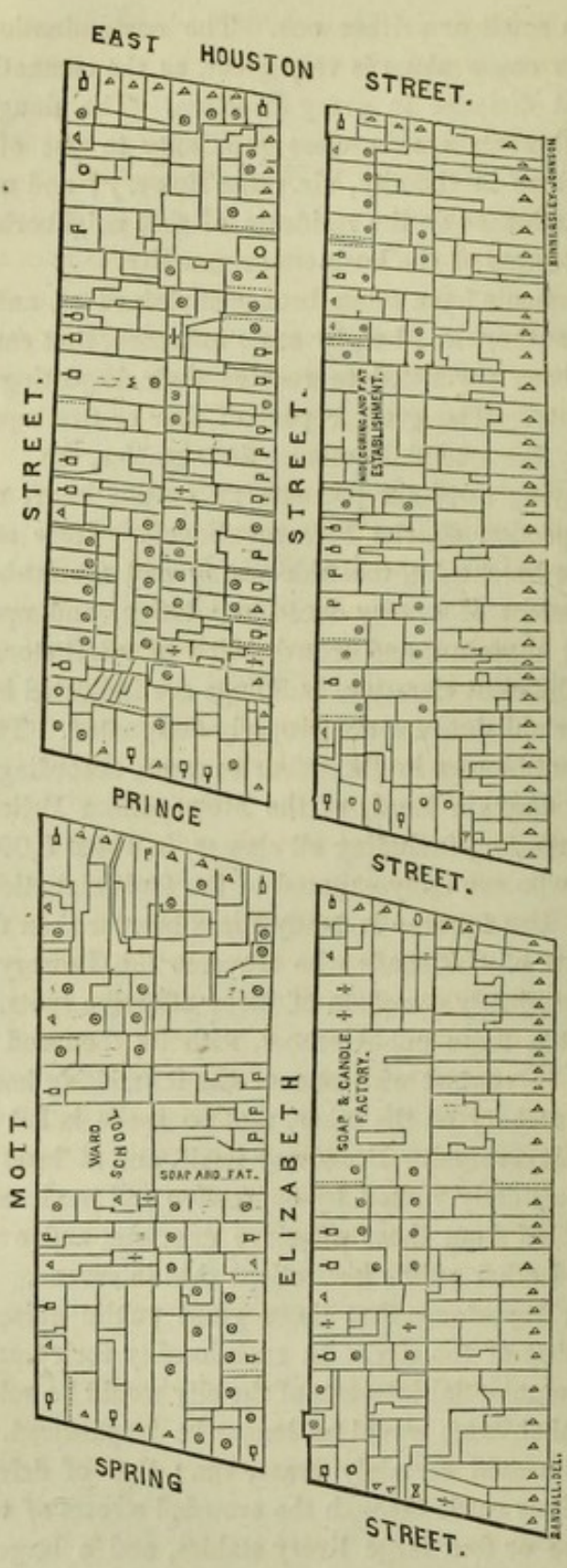
These establishments have often been complained of, and have been closed by the city authorities; but, by some influence, that can "easily be explained," have been permitted to resume their disgusting business in the heart of the city. The greater part of four or five squares are at present occupied by these establishments, their stables, &c.

The accompanying wood-cut presents an outline chart of the worst section of my inspection district here mentioned. Here are exhibited the localities of the butcheries, the hide-curing and the fat-boiling establishments, in the midst of a very dense population, and upon the very border of the most important and crowded line of retail stores and shops in the city. The different classes of buildings are indicated by symbols,* and the offensive establishments are properly designated. The total population of the tenant-houses in these four squares, according to a census just completed by Captain Lord, of the Metropolitan Police, is 4,168, while the total population, including all classes, is about 5,000. But the number of people who are daily exposed to the foul emanations from the nuisances of these four squares is many times greater than that of these residents. The tens of thousands who traverse the Bowery or visit the stores of this region, justly complain of these offensive spots. It will be observed, also, that a large public school, with its thousand children, is brought so closely in contact with one of the fat-melting houses, on one hand, and with a butchery on the other, that no space is left for external ventilation and a playground. Broadway itself, and at least three of its great hotels, are frequently visited by oppressive and noxious vapors and smoke that are wafted from these offensive quarters, and over the three or four asylums and other public institutions that intervene.

It is of the first importance that these great public nuisances be removed to the outskirts of the city. In such locality their business would be facilitated, the commercial interests of the city would be subserved, and the health of the inhabitants would no longer be jeopardized. One most dangerous practice would certainly cease, viz.: that of driving thirsty, frightened, and furious cattle through the crowded streets of our city.

There are three or four large livery stables, and a large number of

* For explanation of the symbols see page 31.



REGION OF THE HIDE-CURING, FAT-GATHERING, FAT AND SOAP BOILING, AND SLAUGHTER-PEN NUISANCES BEHIND THE GREAT SHOPPING-HOUSES ON THE BOWERY.

private ones, in this district. These buildings are almost uniformly in an uncleanly condition, giving rise to emanations of gases poisonous to the air.

There are 6 churches in the ward, one of which is private and belonging to the Sisters of Mercy in Houston Street. There are 4 public schools, one being for colored children. The Marion Street Lying-in Asylum is a well-kept charity, but is situated in the midst of a dense, poor population, where typhus has been very prevalent during the past summer. I have not been able to trace any unfavorable influence upon the health of the inmates from the immediate presence of this disease.

Diseases.—The diseases most prevalent in this district during the last year are typhoid and typhus fevers. During the last three months small-pox has appeared with great violence, all over the ward. There is one particular locality which has contributed to the spread and intensity of the fever contagion, viz.: the little street known as Jersey Street. It is a short and narrow lane, running from Crosby to Mulberry Streets, but one block from Broadway, at its most fashionable portion, thickly inhabited by the poor, three-fourths of whom are negroes, and amongst whom it first broke out in the early part of 1864. Since that time 40 to 50 cases have occurred, and, as far as I can learn, 10 or 12 have died. The disease has spread throughout the street and to houses in other streets. The houses in this street are all old; many of them wooden, with brick fronts and stone foundations. The street is always filthy, and the effluvia arising therefrom are extremely offensive. The privies are generally full nearly to overflowing, and the yards are also in a dirty condition, heaps of refuse matter being allowed to remain and to accumulate continually in many of them. There is no sewer in this little street, though the streets at each end of it are sewered.

There have been attended in this district during the last year, over 200 cases of typhoid and typhus fever, by the Dispensary District Physician; also, 70 cases of dysentery, and 50 cases of small-pox. The population of this district is now about 33,000; and, if we take into consideration that one physician has had so many cases of fever among the very poorest of the people, we approximatively estimate the amount of disease in this ward.

Improvements.—There have been no improvements made in this district during my inspection. I have made but few complaints, from the fact that the greater number of nuisances are *permanent*, and require legislative action for their removal.

Remedial Measures.—This district could be made a very healthy part of the city by removing the nuisances before mentioned; by keeping

the streets, sewers, and privies clean, and free from filth and offal of every description. The removal of all rear tenant-houses is necessary, in order to secure free ventilation. The *overcrowding* of people in tenant-houses and other buildings, as is the custom in this city, is very injurious; and thoroughly effective measures ought to be adopted to prevent it. There is no excuse for this oppression of the poor by landlords. It is a crime to crowd fifty or one hundred families into a building that has only ground and air-space for a fraction of such numbers. The privies should all be made to communicate with the sewers, and there should be such provisions and arrangements for the proper care of garbage, ashes, house-slops, &c., as would tend to insure domestic cleanliness and some degree of social refinement.

REPORT

OF THE

EIGHTH SANITARY INSPECTION DISTRICT.

J. T. KENNEDY, M.D.,
Sanitary Inspector.

BOUNDARIES.—*North by Rivington Street, southeast by Division Street, east by Norfolk Street, west by the Bowery.*

TOPOGRAPHY.—I have ascertained that this comparatively old part of the city was built upon ground as nature moulded it, rolling in its character. This, it will be observed, is of great importance, and fortunate too was it that the hands of the levellers had not reduced it to the low grade of the city, as illustrated on the west side for some distance above Tenth Street. The extreme southern point of the district touches the verge of the hill which was in the region of what is known as Chatham Square, from whence a gentle declination brings us to Canal Street, where a dip occurs terminating at Grand Street, when again a gentle rise occurs toward the northern boundary at Rivington Street. From the east, Norfolk Street, to the west, the Bowery, there is sufficient slope to carry off all surface water, &c., as well as a considerable descent from the extreme southeast point toward the East River.

This part of our city at one time was inhabited by some of our most respected citizens of moderate ideas, confined to houses of two stories in height; but time has changed the whole character of the inhabitants. The "Teutonic" race seems to have rushed in here in sufficient numbers to predominate, and landholders have found it profitable to erect very many substantial tenant-houses, to accommodate the increase of the population; and although there are some exceptions to this, still we might look for many more instances of dilapidation than are found here, where so much of the old city remains. I find there is a good substratum of sand underlaying the whole district; and the sewerage, as indicated on the ac-

companying map by lines drawn through the centre of each street, is very complete, and abundantly sufficient to under-drain and carry off any accumulation of debris. I make use of the term complete, influenced undoubtedly by the topography of the surface, and the character of the soil overlaying the drains, which are more honestly built than many throughout the more modern city under a corrupt contract system. A thorough system of drainage by means of sewers, is of vital importance to the health of large cities; and no spot on the face of the globe is more favored for carrying out that system, than our own New York, surrounded as she is by water-courses ready to receive and bear to the ocean on the receding tide all that passes daily into them; and yet what miserable apologies are constructed beneath this great metropolis, to give origin to constant complaints of offensive sewer-gases and constantly recurring nuisances from obstructions, bad grading, etc.!

Streets.—The streets run about north and south, east and west, and are of a uniform width, 54 feet from house to house, with the exception of Canal and Grand Streets, which are respectively 90 and 75 feet wide, and are the only ones paved with Belgian pavement. The surface is generally well paved, and the gutters in good repair, and adequate to carry off any standing water. The public health is influenced by the manner in which the streets are kept, so far as removing garbage and cleansing generally; and although I have in my record book noted a few solitary instances of neglect of those duties, still I cannot say they have resulted in any pernicious influences. Grand Street is watered twice during the day, during the warm season, and the pavement is thus kept constantly moist, and yet I have noticed no injurious effects in consequence upon this locality. But the insalubrious effect upon the public health is too evident wherever standing water accumulates; and many localities, only a few years back, in this great city, were afflicted in consequence with a malaria frightful in its effects upon both the social and physical condition of the laboring classes. As one example I would call your attention once more to the topography of the Eighth District, and the slope from it terminating in Centre Street, where once was known in all its noxious influence the "Collect," disseminating almost every disease that human skill is called upon to combat. The moral as well as the physical tone of the neighborhood was fearful until the unsightly pool was shut out from the eye by means of underdrainage, through a massive and capacious sewer, down Canal Street to the Hudson River.

The influence of topographical conditions upon the public health may be very properly illustrated by taking the belt across our Island in the centre of which our glorious Park is situated. Only a few years since

a more unhealthy locality could scarcely be found, considering the comparatively sparse population. Beautiful country-seats were deserted, and fevers held entire control. The reasons for this were evident. The rock, approaching close to the surface, prevented the moisture from percolating to any depth, and the exhalations produced the miasmata so general in its results. Streets have been cut through, which, together with the improvements in that great Reservoir of Public Health, have changed the whole face of the country, both in a sanitary and topographical point of view.

Squares.—In the Eighth District there are 48 square, or blocks, three-fifths of which are in a good sanitary condition, two-fifths in a mixed, and none bad. The causes which render squares in whole or in part insalubrious in this district may be traced to their being built in low places or upon made ground, where an insufficiency of drainage exists. Such places offer no inducements for those to remain who can possibly find the means to seek more favored localities; a depreciation of property ensues, and the poor rush in filling every hole and corner to repletion. I have already stated that the Germans, principally mechanics, predominate in this district, and having brought with them from the "Fatherland" all of their institutions, not excepting "*lager bier*," they present excellent illustrations of the effects of healthful out-door exercise and clanish enjoyment. They have more pastimes and festivals than the people of other nations, and as a class they may be looked upon as proficients in all athletic exercises which tend to promote the healthful development of their systems. The east side of the city is a "terra *incognita*" to most of the inhabitants of the west end; but should curiosity prompt any of them to go through Grand Street, the main artery of this section, on any fair Saturday evening, they will be astonished at the immensity of the vast throngs of orderly, and cleanly, well-dressed people, and be struck with the excellent sanitary condition, as evinced by the healthful appearance, and the provailing dialect will stamp them as coming from the land of Goëthe. Their favorite beverage, for old and young, I may say, has much to do beneficially with their moral and hygenic condition, when we look at the character of the people, morally, socially, and hygienically, who dwell in districts where pernicious and insidious distilled poisons are dealt out without stint to the poor working man.

Buildings.—The proportion of tenant-houses to dwellings, stores, saloons, &c., is one-fifth, and a very small number are what would be called private residences, containing three or less families. The private houses are principally the old landmarks, built substantially of brick, with very few exceptions, and every improvement has been introduced for the ingress

and egress of the Croton-water in all its appliances. The rooms in these old-fashioned houses are, as a general thing, nearly one-third larger in size than of those in tenements, and consequently the ventilation must be all-sufficient. Gas is generally used for artifical lighting, and the parlor and cooking-stove dispense their warmth according to the financial circumstances of the inmates. Tenant-houses, of which there are very many good ones in this district, have been to me the subjects of peculiar interest, which has been fully sustained by the pleasing results of my investigations. There are 45 double, 48 single, 61 rear, and 196 partial tenements, all of the three former being of modern structure. The rooms in each will average 12 by 14 feet, with height of ceiling 9 feet, giving 1,512 cubic feet to each. The average number of persons to each apartment is three, and with the most ordinary precautions for the removal of the vitiated atmosphere, and the free admission of the fresh air, there would be an abundant supply for respiration.

VENTILATION.—Dr. Reid, in his admirable and reliable work "*Illustrations of Ventilation*," says: "In a room 12 feet square, 12 feet high, containing, therefore, 1,728 cubic feet of air, there are 10 persons who respire the whole air of the room in 15½ hours, and require a complete change every 17 minutes in order to supply them with 10 cubic feet per minute." The buildings vary from 5 to 6 stories in height, containing on an average 20 rooms each, with hall rooms through, and Croton-water upon each floor, with sinks for ordinary slops. The space between a front and rear tenement, built upon the same lot, is generally from 25 to 35 feet, and in the centre of this space the water-closets are situated, one for every three families, who have access by means of keys, and they are kept in a cleanly condition.

There are no dark rooms, windows being cut in the gables overlooking the passages leading to the isolated rear tenements; hence every facility for thoroughly changing the character of the internal air.

Assuming that the inhabitants of these dwellings belong to an industrious and comparatively educated class, it is but fair to suppose them appreciating the facilities within their reach, to make them cleanly, comfortable, and happy. "Heat is more essential to the human frame than fresh air, which consumes the body by slow combustion, or oxygenation, when food is not supplied."

Stoves are principally used for giving warmth as well as for culinary purposes; and although some open fire-places occur, the ventilating shaft or chimney is in a measure closed up. "Ventilation need not be expected where food, fuel, and clothing are deficient;" but as I am speaking of a people who have enough, if not an abundance of those three necessaries

of life, we would fain hope they might distinguish the difference and advantages of fresh and constantly-renewed air, over vitiated and noxious.

There are garbage-boxes, but not at all sufficient for a people disposed to be cleanly, and who are compelled from necessity to throw their garbage into the streets, to be removed at the convenience of the authorities, who fail to evince a cöoperative spirit with you in your great hygienic labor.

The mephitic odor that emanates from this neglect is the only nuisance of my district; and the only hypothesis I can assume, why it has not affected the health of it materially, is from the fact of its elevation giving great salubrity, the width and regularity of the streets acting as external ventilators, and the total absence in the district of any thing approaching a "cul-de-sac." Under such conditions, in other localities less favored, the influence internally and externally upon the inhabitants, in a sanitary sense, would be very pernicious.

It is estimated that more than one-half of our population reside in tenant-houses; and Dr. Harris states, in his admirable treatise on ventilation, as far back as 1858: "In the Seventeenth Ward there are 1,257 tenant-houses, containing, at that time, a population of 57,000;" he also states, that "in the lower wards the tenant-houses are more closely packed. In one of them, containing 120 to 150 families, of 3 to 10 persons each, there are but 40 feet of frontage and sunlight. The last visitation of cholera was terrific, as well as malignant typhus; eight persons down with the latter disease being found in one small room."

These were fearful figures five years ago; and with the increase of emigration since then, there has been a proportionate addition to the fearful evil. A walk through Greenwich to Cortlandt Street, where once the aristocracy of our city resided, will satisfy the most skeptical as to the above truths. Being near the shipping, and the emigrants' depot at Castle Garden, very many of the poor creatures, who pass through the last-named institution, are induced from its contiguity to take up their residence here, and crowd to suffocation the hundreds of houses never intended to be used as tenements. The seeds of all pestilential diseases are planted in such localities, and inevitably burst forth upon the first provocation.

Another condition materially affecting the health of residents in tenant-houses in densely-populated quarters, as Dr. Reid says, consists "in a healthy tone and character to the occupation of their leisure hours." Hence we properly may note the number and character of the dram-shops and places of dissipation in this district.

In the Eighth District [the Tenth Ward] there are 526 drinking

shops, including lager bier saloons, at least 30 houses of prostitution, and 1 theatre.

There are 2 grammar schools, 5 churches, 1 burial-ground, Essex Market, Police Station-House, Eastern Dispensary, 1 Jail and House of Detention, 6 carpenter shops, 2 carriage factories, 3 livery stables, and 20 private stables.

Within my inspection district the several district physicians from the Eastern Dispensary attend 225 patients per annum, and 100 cases receive the attention of the New York Dispensary physicians. The convenient proximity of these two dispensaries is partially the reason of so few calls for district physicians in this ward.

There have been about half a dozen cases of "small-pox" during the past six months, no epidemics have shown themselves, and but a few isolated cases of fever have been developed. Few sections of the city are blessed with such a high degree of health. Perhaps no other district of equal population is favored with better natural conditions of salubrity. In 1860 the population of this ward amounted to 29,051: the mortality was 796, or 27 to every 1,000 of the deaths; 98 occurred in March, and 33 in December. In 1861 there were 724 deaths, which was one-thirtieth of the whole mortality in the city. The deaths in 1862 were 764, 101 in August, and 43 in October. In 1863 there were 858 deaths; 117 in August, and 51 in September.

The number of deaths occurring since January to September, 1864, inclusive, amount to 724, as follows:

January, 96; February, 85; March, 63; April, 65; May, 70; June, 59; July, 137; August, 83; September, 66—total, 724.

The above facts sustain me in my previously-expressed opinion of the character, hygienically, of the Eighth District, while looking at the records of the Seventeenth to the Twenty-Second Districts for this year, which show a mortality on an average more than double that of the Eighth. It will be remembered that all the above districts are filled with tenant-houses, and in consequence include a large population. Cholera infantum, marasmus, and convulsions more than decimate these localities of children, from one to five years old, particularly those of Irish parentage. The infant rarely receives its nourishment unvitiated; and even when that phase of nature has passed, a careless and indifferent supervision of diet occurs; hence the large figures in the bills of mortality. July and August in every district show a large increase of deaths in consequence of these months, particularly the former being included in the season of unripe fruits.

REPORT

OF THE

NINTH SANITARY INSPECTION DISTRICT.

OSCAR G. SMITH, M. D.,

Sanitary Inspector.

BOUNDARIES.—*North by Division and Grand Streets, east by the East River, south by Catharine Street, west by Division Street. This District comprises all the Seventh Ward.*

TOPOGRAPHY.—The original topography of this district was hilly, sloping to the East River. These hills of diluvium sand, gravel, and boulders, were abrupt and bluffy toward the river, and, in the north-eastern section, at what was originally termed Crown Point, and now Corlears Hook, there was a sharp bluff covered with immense boulders.

The reclaimed or artificially filled ground comprises all the land east of Corlears Street, and including that street to the corner of Corlears and Front Streets. All south of Front up to Jackson Street; all south of Water and Gouverneur Slip; all south of Front Street at Montgomery Slip; all south of a certain point between Cherry and Water Streets, on Jefferson Street; and all south of Water at Pike Street and Rutgers Slip.

The material employed in the filling in of this reclaimed land was the brick and wall refuse of torn-down buildings, street-sweeping dirt, ashes, garbage, cast-off clothing and furniture, and all manner of offal.

There were no water-courses, and but one small pond; the latter was surrounded by large trees, near where Henry Street and Jefferson Street intersect.

On the authority of an old and well-known citizen of the Seventh Ward, Mr. Crosby, it may be recorded that there was no stream to mention from this pond, only a wet meadow extended down toward the river from it.

The present surface-drainage of this portion of the city is excellent.

It is like the roof of a house, the ridge being the northwest boundary line of the district, and the eaves the southerly boundary line.

Whatever superiority may be observed in the health tables of the Seventh Ward, is, in my opinion, mainly owing to the influence of these topographical conditions.

STREETS.—The direction of the streets of the district are parallel to each other, and the cross-streets intersecting at right angles.

The pavement is of cobble stones, except in Grand Street, New Canal Street, and East Broadway, which has the "Belgian" or square block stone, and the best for health and cleanliness.

The sidewalks are paved with flagging, and there are some brick walks in the eastern portion of the district. The condition of sidewalks and streets is good generally, except along the river. Cherry Street is exceedingly filthy, not only in the streets and gutters but on the sidewalks. Catharine Street is very narrow, and being a thronged thoroughfare from a ferry, and occupied by a large market and stores throughout its length, is in a very bad condition. By day people are constantly crowded together on the narrow, dirty sidewalks. Tradesmen's wares, huge signs, drays, carriages, porters with burdens, and mud beneath everywhere, constitute the confused spectacle here. This is repeated on Division Street, another narrow, ill-paved thoroughfare, but a shade less intensified. In Corlears Street, Jackson Street, Scammel Street, and in fact the whole most easterly portion of the district, the streets and gutters are very filthy with mud, ashes, garbage, etc.

This condition of the streets may be found in those localities that are overcrowded with a tenant-house population. For example, the square bounded by Jefferson Street, Clinton Street, Henry Street, and East Broadway, where there are no tenant-houses, no rear buildings of any kind, neither a wooden frame building nor a single liquor store, all are good brick or stone private dwellings, with clean pavements and elegant shade trees. The two stables that are on the square are private, and kept clean and in order. Contrast this square with the one bounded by Jackson Street, Corlears Street, Madison Street, Grand and Monroe Streets, which has 56 dwellings, 31 tenant-houses—12 of which are rear—2 vacant lots, alleys all filthy, streets dirty, with a descending grade easterly, and borders the original high-water line. With its 8 dram-shops, 9 stables, 10 workshops and mills, sidewalks broken, uneven and dirty, can it be doubted that there is insalubrity here? With all these disadvantages of bad sanitary condition, is it to be mistaken what are the causes of insalubrity? In comparing these two squares together, there will be no difficulty in conjecturing in what respect the streets influence the pub-

lic health, especially if they be at the bottom of a grade or well toward the foot of a descending grade. Although there are other causes of the insalubrity in this square which will be referred to again, the surrounding streets have much to do with its unhealthiness. One square is reeking with filth, dirt, and other causes of pestilential diseases, and the other square is clean, orderly, not overcrowded with people, and free from endemic diseases.

Sewerage.—The Seventh Ward is imperfectly sewered in its eastern section. The early sewerage system of the city was very defective, and consequently the sewers in East Broadway and Henry Street, in the western portion of the Seventh Ward, that were laid first, are not the best.

According to my observations the past season, the openings of the sewers into the river at the "slips" are small, emptying at high-water mark, and at low tide 4 or 5 feet above the water. It is noticeable at the foot of Market, Pike, and Gouverneur Streets, where at the foot of the latter street are two sewer openings.

A defective system of sewerage is obviously very detrimental to public health, and it is especially so where the sewers from houses do not work well from the water-closets. Deleterious gases are driven back into the houses when high winds and very high tides prevail. Where steam power is used, it is customary to allow the blowing off of steam into the sewers. Gasworks are also allowed to discharge their wastings and refuse into them. Human exuviæ when decomposing is one of the greatest sources of disease, and therefore should be removed and not allowed to collect from any imperfection of water-closet apparatus or defective sewerage.

Squares.—There are 73 squares in this district. 17 of these are in good sanitary condition, but they constitute less than one-quarter of the whole district. 27 are in a mixed sanitary condition, and 29 are decidedly bad.

The causes which render a square wholly or in part insalubrious are, the greater or less quantity of tenant-house population, the overcrowding and sometimes packing (by taking of boarders, as they style it) in tenant-domiciles, defective house sewerage, want or neglect of domestic cleanliness, carelessness in the disposal of garbage, ashes, and filth.

The presence of old wooden shanties used for stables, and of old wooden frame buildings, sensibly affect the sanitary condition. We must also take into consideration that the tenant-house class of people are crowded in houses where, through the cupidity of landlords, every foot of ground is "made to pay," and that they are obliged to buy inferior food, it is not surprising that they are the most unhealthy class of people, and

that the squares where they live are the most insalubrious. In a former page we have compared two squares to show the difference in a clean, wide street, and a dirty, insalubrious one. Take another example, in squares side by side. The first, bounded by Montgomery and Madison Streets, has good dwellings, occupied by families well to do. It has but one rear tenement, and that is well kept, with a clean alley, and orderly, clean inhabitants. There is not a place where liquors are sold, although stores on three corners. The next adjoining square, bounded by Gouverneur and Montgomery Streets, has filthy old houses, inhabited by people of the tenant-house kind, and liquors sold on every corner; dirty streets, alleys, and courts; stables not clean, and rows of wretched old wooden frame buildings. Side by side stands an excellent square, with good inhabitants and good dwellings, in a good sanitary condition, having on one hand a square in a bad sanitary condition, and on the other a square in *a mixed sanitary* condition. The latter is bounded by Madison, Henry, Gouverneur, and Mongomery Streets. It has good dwellings on all of the streets except Madison. The front and rear tenements that occupy the whole of the latter are in a bad sanitary condition.

INHABITANTS.—The population of this district is made up principally of mechanics, laboring 'longshoremen, and sailors. Sailor boarding-houses are in large numbers throughout the district. A few of the old first-class citizens still reside in the central portion. In the eastern part of the district mechanics and laborers live in closely-packed tenant-houses, and in old-fashioned two and three-story houses.

By far the greater number of the inhabitants of the district is of the laboring class. The occupation of the majority is in following the water or working as 'longshoremen, and the various trades connected with shipping and warehousing.

BUILDINGS.—The total number of dwellings is 2,153. Of these 274 are first-class brick or stone dwellings. Of the dwelling-houses not built for tenements but *having a tenant-house population*, there are 1,269. And there are 610 noted and unmistakable tenant-houses of the modern kind, and having the modern vices.

Number of	courts and alleys,	117
"	rear tenant-houses,	185
"	wood frame dwellings,	274
"	places where intoxicating drinks are sold,	276
"	Stables,	129
"	brothels,	9
"	market-houses,	5
"	mills,	5

Number of work-shops, factories, and foundries,	142
" breweries,	2
" soap-manufactories,	2
" storage-buildings,	33
" bonded (U. S.) warehouses,	9
" schools (public and private),	10
" churches and houses of worship,	6
" ball alleys,	1
" coal yards,	9
" timber yards,	10
" vacant square,	1
" vacant lots,	14

The general character of the private dwellings in this district will not compare unfavorably with first-class dwellings in other sections of the city. They are built of brick, two, three, and four stories, on the usual city lots, 25×100 feet, and belong to a former period before the fashion turned to Murray Hill.

The general character of the buildings occupied as tenant-houses in this district is old, poor, unsuitable, deficient in water supply, defective in drainage, and without provision for the disposal of garbage and slops. Water-closets are commonly the well-hole kind, and if with sewerage connection there is too often some obstruction which makes them sources of nuisance. The apartments are a room and one or two bedrooms to each family, which averages five persons. In each house two or four families are on each floor, with hall and stairs in centre. The rooms are often badly ventilated, small, and bedrooms dark. The halls are generally narrow, dark, dirty, and poorly ventilated.

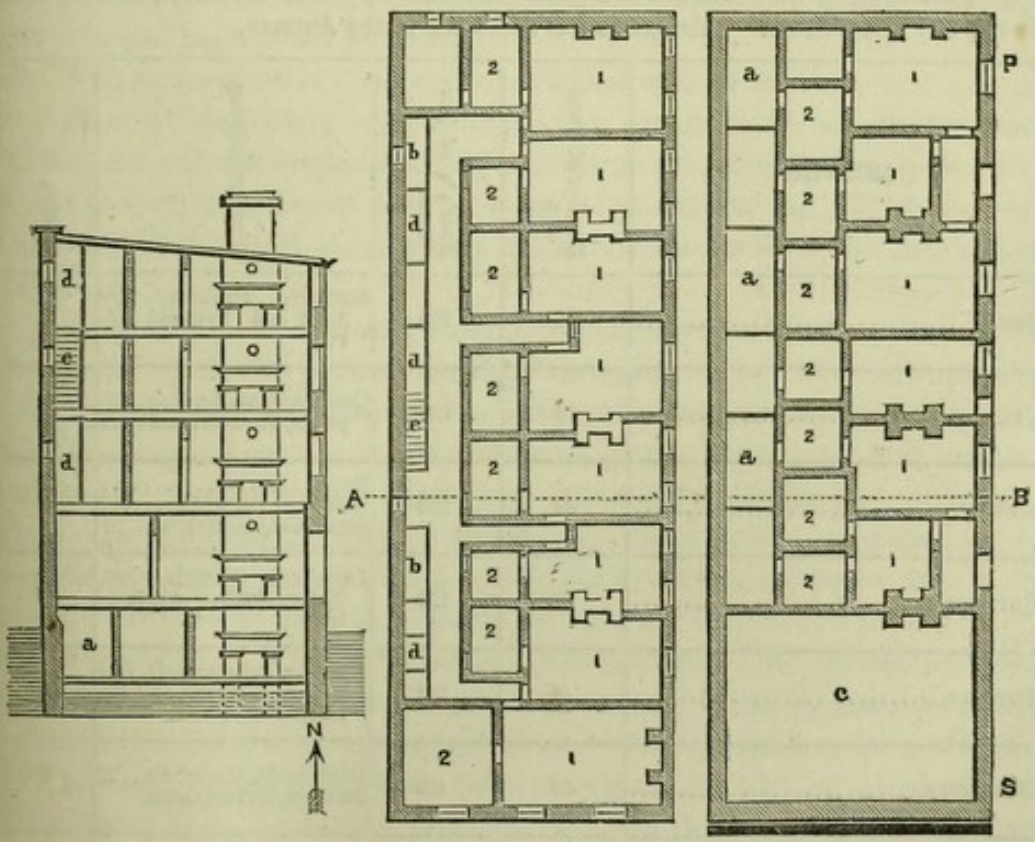
By far the majority of the tenement population in this district live in houses not built as tenements. They are old two and three-story private dwellings, and are turned into tenant-houses by their owners, who think it money thrown away to repair them. The large number of old wooden frame buildings in the eastern part of the district is surprising. In reference to the deficient water supply, it may be stated, the usual style among tenant-houses is, a hydrant and sink in a central position of the court-yard for the use of all the inhabitants of both the front and rear houses, there being no water in the houses. The water-closets are in the court also. In many instances the drainage is superficial, by a gutter formed of flagging in the alley obliquely placed for water and slops to run to the street gutters. In some cases it seemed questionable whether the alley was intended as an entrance-way to a rear house, or a sewage-ditch for slops, water, garbage, human excrements, and urine.

In connection with the subject of drainage, it may be mentioned that two instances were discovered in which the old rain-water cisterns in the yard were used as sinks with stone covers, and the decomposing gases bubble up through the water. These cistern-sinks have no sewer connection. The health of the inhabitants of those houses, and, secondarily, the sanitary condition of the square, are greatly influenced by these bad arrangements of house drainage, deficient water supply, disposal of garbage, bad supply of light and air, damp cellars, unventilated dormitories, crowded rooms, in which the family live, eat, cook, and work.

To exhibit in what respect these conditions influence the public health and also the health and happiness of the inmates, an example can be given on the insalubrious square first mentioned in this report, compared with a good square. On the square bounded by Jackson, Corlears, Madison, Grand, and Monroe Streets, is a tenant-house, at No. — Monroe Street, which is now inhabited by 40 families and 200 persons.* During this season 20 cases of typhus fever originated in this one place alone. The size of the lot is about 40 feet by 100 feet; size of the house 30 feet by 100 feet. It is built of brick and wood, and stands "end to the street." A grocery and liquor store fronts the street. A small, narrow, old, and broken stairway ascends from the street door to the second story. The house fronts easterly, and has a narrow court in its front open to the street, with a stable-shanty at the entrance. A Croton hydrant and sink is in a central and commanding position of the court. The water-closets, which are a curiosity to view, are in the rear of the court, and have wood steps to ascend to the top of the privy, from thence by other old wooden steps to another entrance to the second story of the house. Heaps of dirt are observed behind the water-closet. This tenant-house is four stories high. The rooms are all small, dirty, very badly ventilated, damp, poorly lighted, and *wretched* in the fullest sense of the word. The cellar or basement portion lets out at $2 a month, each apartment consisting of room and bedroom. Height of the ceiling 7¼ feet. There are three entrances, one to each pair of families. To this inhabited cellar-story —which is altogether under ground—wooden steps descend to a small vestibule, from which open three doors to two suites of rooms consisting of a cramped-up, dirty, exceedingly foul, damp, mouldy, and close room and dark bedroom with a closet. One chimney-flue, one window and door are the only means of giving light and air to the occupants. The size of the room 10 × 14 feet. Bedroom 9 × 12 feet, and entirely dark at high noon. There is a foul, damp smell about the place. The inhabitants, affected with scrofula, are destitute of energy, and are obviously dispirited and depraved. In going into other portions of this miserable house, all

* See the Plan and Sectional Views of this tenant-house on page 103 opposite.

may be observed to have something to do, either cooking, washing, ironing, or sewing; but in these cellars they are idle, listless, and look like prisoners in a cell that have now some one to visit and look at them. The rooms on the first floor are not so bad, but are close and unventilated. On the next floor, second story, which is reached by two entrances, from the street and from the court, by means of the wooden steps from the water-closet, a narrow hall extends the length of the rear of the building, and four short halls lead from it, each to a pair of apartments. The width of these short halls is three feet; width of the main hall, extending along the back of the building, is six feet, in which are the stairways, the coal-bins, &c. There are eight family domiciles on this and each of the upper floors. Each family has a room and bedroom. The door opens into the little hall. There is no ventilation except by the small windows of the front room, the bedroom receiving air only by the very small hole opening into the main hall near the ceiling. This opening is tightly closed with boards nailed over it during winter. The halls are dark, dirty, damp, foul, and chilly. The rear has only two windows on each floor, of four small panes of glass



PLAN OF THE MONROE STREET FEVER-NEST.

each. The ceiling of the third floor is $6\frac{3}{4}$ feet high. In some of the rooms and dormitories on this floor in midsummer, green mould is observed on the walls. If it be taken into consideration that in winter the windows and doors must be shut and fires made, is it a wonder, with the poor ventilation the building has, and the small, dark, and foul halls, rooms so damp, close, and wretched, that disease and pestilence should perpetually exist in and spread from this crowded tenant-house? * The building is located on that part of the street at or near the bottom of the grade, and within a few feet of the original high-water mark. It is surrounded on all sides with wooden hovels of stables, and high tenant-houses.

We will give one more example of the external and internal condition of tenant-houses influencing the health of residents:

Between Pike and Rutgers Streets, connecting Monroe with Cherry Street, is a narrow and filthy alley called "Pelham Street." On the west side is a row of brick and wood tenements inhabited from cellar to garret by a squalid population. The cellar has 7 feet ceiling; damp, black with old filth, and very wretched in appearance. Four families inhabit each

* The following table exhibits at a glance the families, persons, sickness, and deaths, in this one tenant-house. This census was taken late in the Autumn.

MONTHS.	Number of Families.	Number of Persons.	Diseases existing.	Deaths.
June,	41	205	Scrofula, Syphilis, Typhus and Typhoid Fever.	1
July,	36	180	Consumption, Scrofula, Syphilis, Cholera Infantum.	3
August,	39	195	Fever, Diarrhœa Infantile, Scrof. Conjunctivitis.	3 4
September,	39	195	Diarrhœa, Scrofula, &c., Tuberculosis, Alcoholism.	1
October,	40	200	Scrofula, Tuberculosis, Delirium Tremens, and Intemperance.	1
November,	39	195	Diphtheria, Croup, &c..... Scrofula, Tuberculosis.	2
December,	32	160	Tuberculosis, Scrofula, Alcoholism &c.	0

of the six houses. They are old, out of repair, dirty, and small. The flooring worn, and steps of the stairways worn through. Doors off the hinges and broken. The houses are two stories, and yards very small. The size of the lots 45 × 18 feet, 18 × 35 feet. The yards are loaded with all manner of filth and rubbish. The "privies" are the old well-hole kind, and are overflowing into and over the yard. In one instance there is one privy to three houses! An opening in the partition fence gives access to the residents. The side wall of a very extensive soap factory on Monroe Street forms the rear of these yards. The privy-houses are in part or entirely gone, and present a truly disgusting spectacle. The sidewalks of the street are very narrow, pavements broken and very dirty. These places must be seen to be fully appeciated, description is impossible.

In this district the retail shops and stores are all on Grand, Division, Catharine, and Jackson Streets.

The workshops consist of blacksmiths, shipwrights, ship-joiners, ship-chandlery, cooperages, iron-foundries, machine and boiler-shops, sugar-refiners, flour-mills, bakeries, cabinet and carriage shops, &c.

There are no slaughter-houses, bone-boiling, or fat-boiling establishments, and but two soap-factories.

The vacant lots in general are well kept and fenced in.

The wooden piers and wharves are generally in a bad condition. They are old, decayed, and filthy. During the whole summer, the pier next to Catharine Ferry was in complete ruins, and the end of pier 49, between Clinton and Montgomery Slips, is bodily sunken into the mud of the river.

Nuisances.—The garbage and ash-box nuisance is a great evil in the Seventh Ward. It pollutes the houses, courts, alleys, vacant lots, streets, and gutters, giving off pestilential gases, offending the sight, and injuring the health of citizens. It is a matter of prime importance and sanitary necessity that a proper method of removing garbage and civic filth speedily and neatly should be adopted. Science and experience fully demonstrate the value of such materials for fertilizing purposes and in the arts, and when so used be a source of city revenue.

Provisions Against Special Nuisances.—The almost universal prevalence of a very offensive class of cloacal nuisances that inevitably result from the absence of any public provision and privacy for the "calls of nature," demands immediate attention from the sanitary authorities of the city. The disgusting stench that is kept reeking at every alley-corner, yard, and warehouse wall, is, especially in this inspection district, a source of public insalubrity.

The Wharves and Docks.—The hygienic importance of improvements that are required in the construction and care of the wharves, docks, and slips in my district, is not likely to receive the attention the subject deserves. Many of the old wooden structures along the river have become a source both of nuisance and danger, and I would respectfully submit whether the system of construction and management of the docks ought not to be immediately and radically improved.

Prostitution.—Though the number of houses of ill-fame in this district is not large, those that are known are of the lowest and vilest kind. They are without any regulations by law or authority, and it would seem that something should be recommended to mitigate or stay the ravages of syphilis.

Small-Pox.—From the frequent prevalence of small-pox in this district, it would seem that some regulation or law should be enforced to make vaccination compulsory. Certainly every reasonable influence should be used. Although the Dispensary offers vaccination to all free of charge, yet there are found some who neglect this vitally-important means of protection from small-pox.

The frequency of places where liquor is sold is to be deplored. Rum and poverty go hand in hand, producing depravity, crime, and disease.

Two hundred and seventy-six places are in the Seventh Ward where liquor is sold, and they are, with few exceptions, inimical to the public health, and perilous to the peace of the city as well as the morals of the laboring classes.

Chief Justice Hale has said that if the crimes and enormities of mankind, the robberies, murders, adulteries, &c., were divided into five parts, four would have been caused by rum.

The number of dram-shops to be met in those localities where a tenant-house class reside, is surprising. They exist on all of the corners, in the centre of the squares, and frequently one after another in a row. They are all in a flourishing condition, and seem to encourage each other, at least there is no opposition or rivalry, but thrive in cultivating a taste for rum. Some squares of the district have not a liquor store on them, and these have not a single tenant-house.

Overcrowded Tenant-Houses.—Perfection is very difficult to reach, and cannot be attained in one step. So the remedy for all the evils of tenant-houses cannot be obtained at once. We can approximate a perfect system of ventilation, water supply, cleanliness, and comfort in a tenant-house. We can, at least, refrain from packing a dozen poor families into an old dilapidated two-story house, built for one family. We can give a more liberal supply of water, better ventilation, the defective

house-drainage and sewerage perfected, water-closets cleaned, larger halls and rooms, in a regular built tenant-house. We can then start from this improvement to reach perfection. Models can then be produced of different classes of houses. Those intended for a single family, those for two or three, those for four or six, and so on to a hotel in numbers and capacity, all having well-ventilated and roomy passages, apartments, and dormitories; the water-closets working with a clean and perfect apparatus, light and fresh air in abundance to every one, water within the reach of every family, and comfort for all.

Diseases.—The rate of mortality of the Seventh Ward is found, on examination, to be increasing. The deaths in 1862 were one to every thirty-nine, and in 1863 one to every thirty-one* of the inhabitants. In order to exhibit the mortality a few tables have been prepared from the City Inspector's Report, and also tables showing the number of families, average number of persons in each dwelling, and the total population of the Seventh Ward.

Deaths in each Month of all Classes in Ninth District, Seventh Ward, 1862–'63.

1862.		1863.	
MONTHS.	DEATHS.	MONTHS.	DEATHS.
January,	108	January,	98
February,	70	February,	89
March,	86	March,	118
April,	61	April,	87
May,	83	May,	80
June,	68	June,	95
July,	99	July,	136
August,	135	August,	193
September,	93	September,	100
October,	86	October,	93
November,	66	November,	86
December,	68	December,	106
Total,	1,018	Total,	1,281

Ratio of Deaths 1 in 39 in 1862, or $2\frac{1}{2}$ per cent.
" " 31 in 1863, or $3\frac{1}{4}$ "
Population 40,006.
Number of Families, 7,354.
Number of Families to each Dwelling, $5\frac{1}{2}$.
Number of Persons to each Dwelling, 17.

* See Report of City Inspector for years 1862 and 1863 respectively.

Deaths in each Month of Adults and Children in the City of New York, during the year 1862.

MONTHS.	ADULTS.	CHILDREN.	TOTAL.
January,	722	1,086	1,808
February,	671	919	1,590
March,	783	1,083	1,866
April,	780	991	1,771
May,	714	867	1,581
June,	663	830	1,493
July,	724	1,550	2,274
August,	852	1,675	2,527
September,	682	1,242	1,924
October,	682	814	1,496
November,	606	737	1,343
December,	676	895	1,571
Total,	8,555	12,689	21,244

Deaths in each Month of Adults and Children in the City of New York, during the year 1863.

MONTHS.	ADULTS.	CHILDREN.	TOTAL.
January,	767	1,032	1,799
February,	805	1,204	2,009
March,	829	1,129	1,958
April,	870	1,121	1,991
May,	823	977	1,800
June,	763	989	1,752
July,	868	1,814	2,682
August,	1,263	2,154	3,417
September,	876	1,146	2,022
October,	922	996	1,918
November,	924	908	1,852
December,	896	1,100	1,996
Total,	10,596	14,600	25,196

No great amount of diarrhœal complaints have occurred on this side of the city last season. What dysentery, measles, and fever prevailed during this season was confined to those squares crowded with a tenant-house population. Inflammations of an erysipelatous character were found in those localities that were the most cursed with the nuisances of old wooden buildings, filthy yards, alleys, and privies. Small-pox has occurred in former years in the eastern section of the district. The Dispensary District Physician, Dr. Morse, referred to several cases in Monroe Street. The sickness which prevails in the worst tenant-houses, without reference to its nature, is always found less amenable to treatment than in places in better sanitary condition. At No. — Monroe Street, cholera

infantum and diarrhœas have been common this summer. Several deaths have been there the past summer from those causes. In Hamilton Street there have been a number of cases of typhoid fever the past season. It may be regarded as a very insalubrious quarter, as there are many old, filthy, overcrowded tenant-houses in the street.

Wherever a tenant-house square exists, with its filthy streets, alleys, yards, and crowded houses badly ventilated, and inhabitants ill fed and poorly clad, there pestilential disease prevails with greater virulence; demonstrating, most conclusively, that it is of the very greatest importance to have every house, yard, and street, in the best sanitary condition, to resist diseases.

REPORT

OF THE

TENTH SANITARY INSPECTION DISTRICT.

JOHN C. ACHESON, M. D.

Sanitary Inspector.

BOUNDARIES.—*North by Rivington Street, east by the East River, south by Division and Grand Streets, west by Norfolk Street.*

TOPOGRAPHY.—About seven-eighths of the district is almost entirely level, having a very slight descent toward the river; scarcely sufficient, indeed, to carry off the surface drainage. The remainder of the district lies upon the northern slope of an elevation, formerly known as "Mount Pitt," which consisted of a ridge of hills elevated from 10 to 30 feet above the adjoining plain, on which, in revolutionary times, a series of forts were built for the protection of the eastern side of the city. As the city advanced in that direction these hills were cut down, so as to conform as far as possible, to the surrounding surface; but traces of them are still distinctly visible in the descent of the belt of squares on the north side of Grand Street (which lies on the summit of the hill), extending from Clinton to Goerck Streets. The material taken from these hills was used in levelling and grading the remainder of the district, and in extending it out to its present water line on the East River. By this process of "filling in," about eleven squares of ground were added to the district, and a good straight water front was gained, with a depth of water capable of accommodating the largest vessels.

By referring to the Sanitary Map of the city, it will be seen that the high-water line originally crossed Grand Street near Goerck, and passed westward, almost to Cannon Street. It will be observed that a space of nearly four belts of squares has been reclaimed from the river.

With the exception of the alterations just described, the district still

retains its natural formation. There are no records of any streams or collections of water ever having existed on its surface; though it is presumed that nearly the whole of the district was once covered by the river, from the fact that the wells which were dug on it anywhere, except on the hills referred to above, furnished water which was decidedly brackish to the taste, and contained a perceptible amount of salt.

Geology.—The soil of the level part of the district is a fine red sand, quite free from stones, and affording good drainage to a surface which would otherwise be constantly wet, on account of its not having sufficient descent toward the river. The soil of the elevated portion is a coarse gravel, mixed with stones, from a few pounds to half a ton in weight. This latter part of the ground has sufficient slope to afford complete drainage to the surface, and prevent the accumulation of water and filth on the streets. For the above reasons the insalubrity of the district cannot be charged fairly on its topography.

Streets.—The streets run east and west, and north and south, and are of very good width. They are all paved with cobble stones, except Grand Street, which is covered with trap-block pavement. The condition of the pavement is moderately good, but the streets are generally in a filthy and unwholesome condition; especially in front of the tenant-houses, from which the garbage and slops are, to a great extent, thrown into the streets, where they putrefy, rendering the air offensive to the smell and deleterious to health. The refuse of the bedrooms of those sick with typhoid and scarlet fevers and small-pox, is frequently thrown into the streets, there to contaminate the air, and, no doubt, aid in the spread of those pestilential diseases.

Sewerage.—About half of the district is provided with capacious brick sewers, which are apparently well built and in good order, and empty into the East River below tide-water. A very small proportion of the dwelling-houses are connected with the sewers, so that their effect upon the insalubrity of the houses must be mainly negative. Their general effect upon the public health is doubtless good, inasmuch as they assist in the drainage of the surface.

Squares.—The district is composed of 49 squares; about one-third of which are in good, one-half in a mixed, and the remainder in a *bad* sanitary condition. Those which are decidedly insalubrious are rendered so by the lowness of the ground, insufficient sewerage, unsuitable dwellings (which are overcrowded by a careless and ignorant class of occupants), neglected privies in too close proximity to the dwellings, and the filthiness of the streets.

Inhabitants.—The great majority of the inhabitants belong to the

working class, who depend upon their weekly income of their labor for the support of themselves and families. Fully one-half of the males belong to the laboring class; the rest are mechanics and tradesmen. There is also a large number of females who earn their living as operatives in factories in this and in the lower parts of the city. The majority of the inhabitants are Irish. The Germans rank next, and Americans last. The greater number of all these belong to the poorer and more ignorant classes of the community, and are careless in their habits, and regardless of the appearance and healthfulness of their domiciles. They are, of course, pliable instruments in the hands of designing politicians and demagogues.

BUILDINGS.—

Total number of buildings,	1,732
Private dwellings,	1,327
Rear buildings,	323
Tenant-houses,	405
Liquor saloons,	188
Brothels,	9
Factories,	85
Churches and other public buildings,	16
Coal and lumber yards,	31
Store-houses,	17
Stables,	87
Slaughter-houses,	none.

Nearly three-fourths of the whole number of buildings are private dwellings. Most of the private residences have been built at least twenty years. The majority of them are built of brick, some of wood, and others still are frame buildings with brick fronts. They are mostly deficient in the conveniences and comforts of dwellings of more modern date, such as baths, gas, and sewer-connections, etc., but in their appointments for health, such as capacity, size of apartments and dormitories, ventilation, drainage, heating, etc., they present few objectionable features, and indeed are, in some respects, superior to many buildings of more recent date. A little over one-fourth are tenant-houses. Their general character as regards location, age, size, drainage, water supply, etc., is bad. They generally occupy too much of the lots on which they are built; are not connected with the sewers, therefore the garbage and refuse from them are to a great extent thrown into the streets and alleys. Many have an insufficient supply of water, sometimes from 20 to 40 families depending upon a single hydrant in the yard. Many are densely crowded; some by

a careless and shiftless class of people. They generally have very insufficient means of ventilation, and very often where these means are ample, the only obtainable air is poisoned by the odors from the filthy streets and offensive privies.

Nuisances.—There are no slaughter-houses, fat-boiling establishments, or other such public nuisances in the district, nor are any of the numerous factories in the district devoted to any business which is deleterious to the public health.

Diseases.—The most prominent diseases during the past year have been phthisis, typhoid and scarlet fevers, cholera-infantum, dysentery, small-pox, and diphtheria. It would be impossible to specify the exact localities of all these cases of disease, but it may be stated, in a general way, that they were most prevalent in that part of the district which is bounded by Broome, Rivington, and Ridge Streets, and the East River. This is also, in every respect, the poorest part of the district, having the lowest ground, the filthiest streets, and the most dense population of poor and careless people, who are crowded in the numerous tenant-houses, shanties, and small dwellings, which were built for one or two families, but are now made to contain from 5 to 10.

Causes of Insalubrity.—The high rate of sickness and mortality among the people of this district, is undoubtedly attributable to two general causes, viz.:

1st. Their insalubrious surroundings, such as the filthy streets, deficient sewerage, neglected privies, overcrowded and ill-ventilated dwellings, and deficiency of water supply; and 2d. The ignorant and careless habits of the people themselves. Any measures that may be adopted for improving the sanitary condition of the district will meet with only partial success, or must fail altogether, unless they are directed to the removal of both these causes. The condition of the poorer classes would be but slightly improved by their removal to the most perfect dwellings that could be constructed, if they took their present habits with them, and were allowed to disregard personal and domiciliary cleanliness; to close all avenues for the ingress of good and the exit of bad air, and to eat their unwholesome and badly-prepared food. Then, on the other hand, it is almost impossible to instill good habits, intelligence, and morality into people who live in the contracted and unventilated apartments of overcrowded and closely-packed houses, filled with the noisome odors arising from streets reeking with filth, or from neglected privies and court yards.

Both this proposition and its converse are true, that to improve the health of the people, we must improve their physical and their moral habits.

Remedial Measures.—In order to remove the first of the causes referred to above, and render the district salubrious, the streets should be paved with Belgian or block pavement, and have a greater elevation in the central axis of the street than at present. This pavement should be kept in good repair and cleaned as often as twice or three times a week. The gutters should be cleaned every day. Garbage-boxes have been shown to be deleterious to health, as well as offensive to the senses, and should be, therefore, abolished. The present system of disposing of garbage would probably be comparatively unobjectionable if it were faithfully practiced.

There ought to be capacious sewers in all the streets, with which every house containing more than two families should be connected. The rate of populating them ought to be limited by law, on the same principle and by the same right that the law interferes in the crowding of passenger ships.

There is need of thorough reform in the construction and care of tenant-houses. New architectural designs should be produced, in which there shall be displayed some care for the health and comfort of the tenants, instead of those now in vogue, which were devised exclusively for the profit of the owners.

In general, only one house should be built on each lot, and that of such dimensions that sufficient space would be reserved for yard, playground, privies, etc.

The houses ought not to be more than four stories in height, with high ceilings, large open fire-places, capacious rooms, halls, and stairways. The stairways should be placed in the front or rear part of the building, so that windows could open upon them, and furnish them and the halls with sufficient light and air. They are now mostly in the centre of the houses, where they are excluded from the light, and are dark, damp, and unventilated. No more than two families should be allowed to occupy each floor, so that ventilation could be insured through each apartment, either from front to rear or from side to side of the house. There should be an ample supply of water on each floor. The privies would be preferably located in the yard, if they were connected with the sewers. A good plan has been lately adopted of entrusting the care of the house and the cleansing of the halls, stairways, yard, etc., to a tenant who performs such duties in payment of his rent.

Authority should be given to Health Wardens to close and remove a building that has become insalubrious in consequence of its having become infected with pestilential disease, or even to demolish those that are uninhabitable on account of their age and want of repair. By this means

the fever-nests and pest-houses could be disinfected, and all the shanties and filthy rookeries which abound in this district could be removed.

Now, having provided good dwellings for the poor, a difficult task still remains in reforming the people themselves, in changing their habits and morals, and instructing them how to live properly. This could, to some extent, be accomplished by getting their clergy to interest themselves in the temporal as well as spiritual affairs of their parishioners; by the employment of sanitary missionaries and lecturers among them; by the circulation of cheap newspapers, or by the insertion in the papers now read by them of short readable articles that will teach them the ordinary rules of health, and incite them to habits of cleanliness in their persons and their domiciles; that will tell them how to prevent disease, how to cook, eat, sleep, and dress, and show them the value of good air, and the economy of eating only wholesome and properly-prepared food.

Having thus reformed the poorer classes, and provided suitable dwellings for them to live in, their health and happiness will be promoted, the rate of mortality be diminished, and lasting benefits will be conferred upon the city and the State.

REPORT

OF THE

ELEVENTH SANITARY INSPECTION DISTRICT.

JAMES. L. BROWN, M. D.
Sanitary Inspector.

BOUNDARIES.—*North by West 14th Street, east by Sixth Avenue, south by Christopher Street, west by the Hudson River.*

This district includes what was formerly known as the village of Greenwich, one of the ancient suburbs of the city, besides other localities of greater or less historic interest. Greenwich village was situated on the shore of the river about a mile and a half north of the City Hall, and was settled at a comparatively early period in the history of the island. It extended from Christopher Street about as far north as Hammond or Bank Street, and was for many years the seat of the State Prison, which in 1828 was removed to Sing Sing. A part of the old prison may still be seen occupying a large part of the square bounded by Washington, West, Charles, and West Tenth Streets. It is now used as a brewery, excepting a small part that has been converted into tenements. Further north, at the corner of Washington and "Little" Twelfth Streets, on what was once the bank of the river, stood "old" Fort Gansevoort, while on the square bounded by Perry, Charles, Fourth, and Bleecker Streets, there still remains one of the oldest private dwellings on the island—the Van Ness House.

This part of the island has always enjoyed a high reputation for salubrity, which was doubtless one of the reasons that led to its selection in 1793 as a site for the prison. During the prevalence of the yellow fever, on the occasion of its third visitation, in the summer of 1798, when business was almost entirely suspended, and all whose circumstances would permit had fled the city, the village of Greenwich was a favorite and safe retreat, being at that time separated from the city by nearly a mile and a

half of open country. Bank Street is said to owe its name to the circumstance that the banks were removed there from Wall Street during the prevalence of one of these epidemics.

Topography.—The only topographical changes of any importance that have taken place in this district, as indicated by the old maps, and confirmed by the statements of former residents, consist in the reclaiming of a considerable belt of ground from the river, and the cutting away of a hill which extended along the line of Greenwich and Hudson Streets from Christopher Street about as far north as Bethune Street. No water-course, or pond, or marsh of any kind is known to have existed within its limits, nor is there any *made* ground except that which has been reclaimed from the river. The original shore of the river extended a considerable distance within the present line of piers, jutting in between Bank and Gansevoort Streets nearly as far as Greenwich Street. All of the houses in West Street, and about two-thirds of those in Washington Street, stand on *made* ground.

According to the report of the State Geological Survey, this part of the city is built upon drift deposits; the soil consisting chiefly of loam, gravel, sand, pebbles, etc. Nowhere in the district does the rock approach within 50 feet of the surface. In boring for a well on the corner of Waverly Place and Perry Street, the rock was struck at a depth of 70 feet. Other borings showed an increase of depth in the direction of the river, and a decrease toward the centre of the island along the line of Broadway, and also to the northward.

Drainage.—Nearly the whole surface of the district slopes gently toward the river, affording an excellent surface-drainage. The greatest elevation is in Fourth Street, in the vicinity of Hammond and Perry Streets, where it is 27 feet above tide-water; and the lowest is along the line of West Street, where it is only 4 feet.

In considering the topographical conditions of this district with respect to their influence on the public health, there appears to be nothing that can be regarded as prejudicial. Even the houses situated on the newly-made ground along the river do not appear to be less salubrious than others.

Streets.—The number of streets included wholly or in part within this district is 28, of which 14 pursue a nearly westerly direction toward the river, the others intersecting them at various angles. Their width between the opposite buildings varies from 50 to 100 feet, about one-half not exceeding the former number. The widest are Hudson and Fourteenth Streets, and the Avenues from the Sixth to Eleventh. As there are very few high buildings in any of the narrower streets, their general condition

with respect to ventilation and sunlight is very fair. With but two or three exceptions, they are all paved with cobble stones, and vary much as regards their cleanliness and state of repair.

In some parts of the district, as for instance in West, Washington, Little Twelfth, and Gansevoort Streets, they are always filthy, being but seldom cleaned, and then very imperfectly. In other localities, where it is the custom for each family to keep the street in front of its own door always cleanly swept, their condition is very good. The influence which the streets may exercise upon the public health is generally dependent upon three circumstances, viz.: their width, the kind and condition of their pavement, and their cleanliness. On the score of width there is not much to complain of in this district, but with respect to the other two points there is room for considerable improvement. That cities with cobble-stone pavements are less healthy than those paved with cubical blocks, is a fact that has long been known, and is now universally conceded. The reason is obvious: the irregular interspaces between the stones afford a lodgment to various animal and vegetable matters which are never reached by the broom of the sweeper, and which, decomposing under the action of the summer sun, give origin to those poisonous emanations that render the atmosphere of large cities so unwholesome in warm weather. But this is a trifling evil in comparison with those resulting, not from any defect in the pavement, but from the accumulations of filth reposing *upon* it, and due to an utter want of any proper system of street cleaning. Upon this point, however, it is unnecessary here to dilate. The effect of dirty streets upon the public health is too well known, and too often insisted upon, to need any exposition in this report. It will suffice to state that the largest number of cases of cholera infantum, cholera morbus, and kindred disease, is always found in localities where the streets are dirtiest.

Sewerage.—The sewerage in this district is defective both in quantity and quality; some of the streets having none at all, and the sewers which do not exist displaying, according to the testimony of competent engineers, "a sad want of forethought and engineering knowledge." In this respect, however, they do not differ from sewers generally throughout the city. Eleven streets are sewered throughout their whole extent; five not at all; and the remainder only on occasional blocks. Their outlet is generally below high-water mark; but to this there is one exception which is of special interest as illustrating the pernicious influence which imperfect or obstructed sewerage may exercise upon the public health. The sewer through Gansevoort Street extends no further than West Street, all the ground between this street and the river

having been made since the sewer was built—most of it, indeed, within the past year.

From the terminus of the sewer, through this newly-made ground, an irregular, narrow, open channel has been rudely excavated, by which it appears to have been intended that the contents of the sewer should reach the river. In point of fact, however, they never do so. From the falling in of its sides, and other like causes, this channel becomes constantly obstructed, and the flow of the sewage impeded. Independent, however, of any such obstruction, the result must practically be the same; for long before the contents of the sewer could reach the water's edge, their fluid portion would be absorbed by the loose ground beneath, and the solid residue be left on the bottom and sides of the channel. And this is precisely what has been taking place here for several months, until this new ground has become very thoroughly saturated.

Of the effect of this state of things upon the public health we may form some notion from the following facts: The only square in the immediate vicinity containing any dwellings, is that bounded by Gansevoort, West, Washington, and Horatio Streets. Until within the last year this has justly been considered one of the healthiest in the city, old residents of fifteen to eighteen years' standing testifying to its uniform salubrity. About the middle of July, through the kindness of Dr. Wm. C. Hunter, my attention was called to this locality on account of the unusual amount of sickness that had come to his knowledge while in attendance upon some patients in the neighborhood. I at once made a careful inspection of the square, examining every house, and interrogating every family; *and ascertained that no less than* 29 *cases of dysentery and diarrhœa*, 5 *of which had terminated fatally, had occurred during the three weeks immediately preceding my inspection.*

Now, when we take into consideration the fact that there are only twenty-two dwellings on this square (a considerable portion of it being occupied by a large lumber yard), and that all these cases had occurred within a period of about twenty-one days, the ratio becomes appalling. How many cases may have occurred subsequently, I have not sought to ascertain, my time being fully occupied in the inspection of the other parts of my district. But a still more direct and specific action of the poisonous emanations proceeding from this obstructed sewage, manifested itself in the dwelling on the corner of West and Gansevoort Streets, which is in the closest proximity to the outlet of the sewer. *Here I learned, upon inquiry, that typhoid fever had prevailed almost continuously during the preceding winter, and I found three severe cases of dysentery at the time of my visit.*

These facts require no comment.

SQUARES.—The number of squares in the Eleventh District is 84, of which about one-half are in a very good sanitary condition, one-eighth in a bad sanitary condition, and the remaining three-eighths intermediate. As an example of a square in a very good sanitary condition may be mentioned that bounded by Thirteenth and Twelfth Streets, Sixth and Seventh Avenues, while one of a directly opposite character may be found between the same streets and Ninth and Tenth Avenues. The circumstances determining the sanitary condition of a square depend mainly upon its topographical peculiarities, the condition of its streets, its sewerage and drainage, the kind and condition of its dwellings, the character of its population, its proximity to any marked source of insalubrity, etc. It is with reference to these points that the above classification has been made.

POPULATION.—The population of this district probably contains a larger proportion of native-born residents than that of any other in the city, unless, perhaps, we may except the Fifteenth Ward, which was originally included in the Ninth. The Knickerbocker element is widely diffused, and exercises no small influence in maintaining the high reputation for salubrity which the Ninth Ward has always enjoyed. There are very few wealthy families, and *comparatively* few of the very poor or vicious. The great bulk of the inhabitants consists of what may be called the middle class of people, composed mainly of trades-people, clerks, mechanics of the better class, cartmen, etc.

BUILDINGS.—Of the buildings, the great majority are dwelling-houses, the chief exceptions being along the line of the river, where iron foundries, factories of various kinds, steam sawmills and planing mills, lumber, coal, and stone yards, etc., occupy most of the squares fronting on the water.

DWELLINGS.—The number of dwellings is 2,205, of which 484 may be considered tenant-houses. It has been a source of no little embarrassment to determine where the line of demarcation between private dwellings and tenant-houses should be drawn, so gradual is the transition from first-class private residences to tenements of the lowest grade. About four-fifths of the tenant-houses in this district were originally private dwellings of a very respectable character, which have gradually degenerated into tenements of the worst description, because never designed for more than one family. It is during this state of transition, while they have ceased to be very good, but are not yet very bad, that it is difficult to classify them. By tenant-houses are meant, in the present report, all those originally designed as such, and all others once used as private

dwellings, but now occupied by more than three families. This classification is, of course, purely arbitrary, and open to some objections, but I have met with none better.

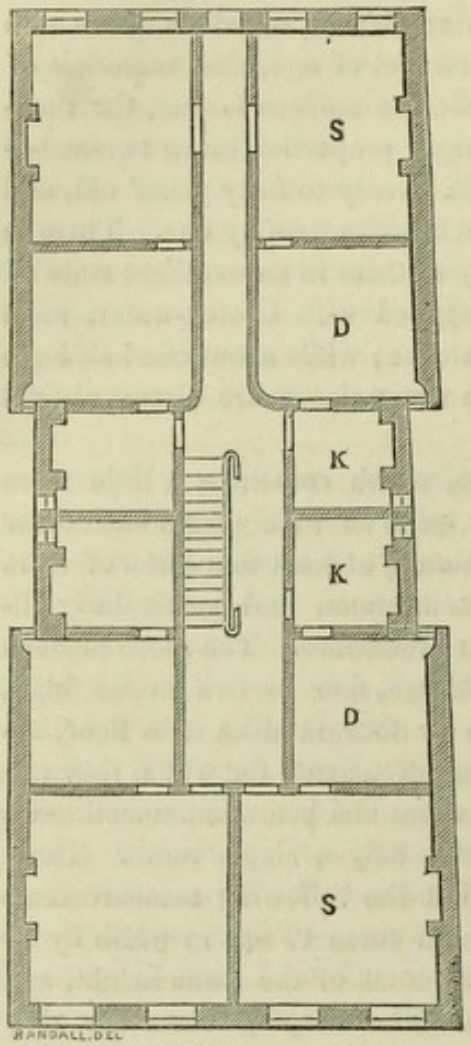
PRIVATE DWELLINGS.—The private residences, of which there are 1,721, present the widest differences in respect of age, size, materials of structure, and other particulars. Of first-class modern houses, the number is comparatively small, by far the larger proportion being two-and-a-half and three-story brick dwellings, from twenty to forty years' old, and occupied more frequently by two or three families than by one. There is quite a number of frame buildings, many of them in an excellent state of preservation. All the dwellings are supplied with Croton-water, most of them lighted with gas and heated by stoves; while about one-half have drains connecting with the sewers. The water-closets are almost always in the yards.

TENANT-HOUSES.—The tenant-houses, which constitute a little more than one-fifth of all the dwellings, differ quite as widely from each other as the private residences. As already stated, at least four-fifths of them are private dwellings, in reduced circumstances, and particularly ill-adapted to the accommodation of a number of families. The more modern tenements are generally large brick buildings, four or five stories high, and intended to accommodate either two or four families on a floor, according to the size of the lot or the class of tenants for whom they are designed. Each family has usually one room and bedroom, sometimes a room and two bedrooms, and occasionally only a single room. These rooms vary in size in different houses, but the following measurements may be taken as a fair average: The main room 12 feet in width by 15 in length, and 8 or 9 in height. The bedrooms of the same height, and about 7 × 9 in the other measurements. The sleeping-rooms are very commonly what are called "dark bedrooms," *i. e.*, rooms without any windows opening externally, and consequently badly lighted, and very imperfectly ventilated. There is generally a supply of Croton-water on each floor, sometimes in the apartments, but more frequently in the halls, with drains for the waste water connecting with the sewers. The water-closets are almost invariably in the yards, frequently inadequate, and commonly quite filthy. The cellars generally contain the coal-bins and wood-houses. The garbage is left on the sidewalk for collection, sometimes in a common garbage-box, but in this district much more frequently in vessels or boxes belonging to the different families.

To illustrate the most favorable features of any of the tenant-houses I have seen, and at the same time to present for commendation a most laudable example of what is practicable and entirely successful as an im-

provement in an ordinary tenant-house, the following diagram and notes are copied from my Record of Inspections:

IMPROVED TENANT-HOUSE.



S S Sitting-Rooms.
K K Kitchens.
D D Dormitories.

No. 89 Perry Street is a large brick building, 28 feet in width, 5 stories in height (each story averaging nearly 10 feet between ceilings), and accommodating 20 families (4 families on a floor). Notwithstanding the large number of families occupying the house, it is so much superior, in some of its features, to other tenant-houses, that I have thought it worthy of special description.

The accompanying diagram is designed to show the arrangement of the rooms on each floor, and *particularly the means resorted to for securing better ventilation than usual.* Each family has three rooms (marked in the diagram S D K): S is a large sitting or living-room; D is a bedroom or dormitory; and K the kitchen. The sitting-room and kitchen have each an independent entrance into the main hall. The bedrooms are reached either through the sitting-rooms or kitchens. . . . Every apartment has a window or windows directly to the external air. . .

There is a supply of Croton-water in every kitchen, with good drainage. There is no garbage-box, each family delivers over to the collector its own garbage, so that the street in front of this house is as clean as before any private dwelling. The halls are kept clean by a woman employed for that purpose by the landlord. The families are all of a good character, and their rooms are generally comfortably furnished and well kept. This house, as might be expected, *has been very free from sickness.**

Nearly one-fifth of all the tenements are rear buildings, some of them of the lowest grade. They are generally contracted in size, very imperfectly ventilated, shut out in a great measure from the reach of the sun-

* Copied from pages 70 and 71 of the Inspector's Sanitary Record of the Eleventh District.

light, and commonly an obstruction to light and ventilation in the front buildings. The interval between the front and rear house is frequently so small, and sometimes so completely enclosed on all its sides by the adjacent houses, as to constitute a mere well-hole. A very fair illustration of this may be seen at No. 98 Hammond Street. But the worst feature of all in connection with tenant-houses is one less frequently met with in those of modern construction than in dwellings once private, but now occupied by seven or eight families; I allude to the occupancy of low and damp cellars. At Nos. 137, 139, 141, and 143 Hammond Street, and also at No. 738 Washington Street, are inhabited cellars, the ceilings of which are below the level of the street, inaccessible to the rays of the sun, and always damp and dismal. Three of them are flooded at every heavy rain, and require to be baled out. They are let at a somewhat smaller rent than is asked for apartments on an upper floor, and are rented by those to whom poverty leaves no choice. They are rarely vacant.

Tenant-houses differ much in the character of their population and in their cleanliness, the most striking contrasts in these respects being observed among those of equal pretensions in other particulars. On the corner of Thirteenth Street and Tenth Avenue is a large tenement containing 23 families, the halls of which are never swept or otherwise cleaned from one end of the year to the other. A like condition exists also at No. 4 Horatio Street, and Nos. 125 and 127 Greenwich Avenue, where 18 families are accommodated (?) in each house. On the other hand, at No. 89 Perry Street we have seen a large tenement, containing 20 families, in which the halls as well as the apartments are kept as clean as in many private dwellings. Other things being equal, houses differing so widely in point of cleanliness, must differ in a corresponding degree in their sanitary condition.

Drinking-Shops.—The number of drinking-shops in the Eleventh District is 83, besides 73 liquor-selling groceries, making a total of 156 places where liquors are retailed. The free use of alcoholic liquors, especially of such a quality as is sold in these stores, is, in my opinion, one of the most prolific causes of disease existing among us. Being in the highest degree a predisposing as well as an exciting cause of disease, it is justly responsible for a large share of the mortality ascribed to other causes.

Slaughter-Houses.—Of slaughter-houses there are 12, about one-half of which are situated on the squares fronting on the river, and not in the immediate vicinity of any dwelling. They are generally in good condition, and probably as well kept as is practicable; nevertheless they are

inevitably a nuisance to a greater or less degree, and should be provided for by some special municipal legislation.

Garbage-Boxes.—The only other nuisance to which I would make allusion in this place is one that has already been made a subject of special report by the corps of Sanitary Inspectors, and might, therefore, escape further notice if attention were not again directed to it in the final reports. I refer to garbage-boxes. In front of many of the large tenant-houses are placed on the edge of the sidewalk huge wooden boxes for the reception of all the ashes, garbage, etc., of the score of families within. Not unfrequently one box does double duty in this respect, without, however, being always of double size. It is invariably the case that where these boxes exist, the streets are in a filthy condition.

Prevailing Diseases.—The diseases that have chiefly prevailed during the past season are dysentery, diarrhœa, cholera morbus, cholera infantum, and the exanthematous fevers. They were of most frequent occurrence in the more crowded and insalubrious quarters. Typhus and typhoid fevers were met with in only three or four localities, as, for instance, at Fifteenth and Little Twelfth Streets, No. 148 West Tenth Street, and on the corner of Gansevoort and West Streets. They seldom prevail to any considerable extent in this district.

Notwithstanding the existence of many localities in a bad sanitary condition, the Ninth Ward, next to the Fifteenth, is the healthiest in the city. It has been a very common experience with me in the course of this inspection to find "insalubrious quarters where the constant sickness rate has been slight," and I have generally explained the fact on the ground that in this district these quarters are usually isolated, having surroundings of a good character, which by a sort of *diluting* agency exercise a protective influence over them. In other words, their evils are not *concentrated* as in other sections of the city. The proximity, too, of the worst localities to the river, whereby they receive a larger supply of fresh air than would otherwise be the case, is likewise a source of protection.

Remedial Measures.—Having now considered the various points to which attention was given in this inspection, it only remains to suggest as briefly as possible some remedial measures applicable to the different cases:

1. There should be a more general and more perfect system of sewerage.

2. The streets should be paved with cubical blocks in place of cobble stones, *and some efficient means adopted for keeping them clean.*

3. The whole system of garbage-boxes should be abolished as only tending to aggravate the evils it was designed to remedy.

4. Tenant-houses should be constructed with special reference to perfect ventilation, free access of the sunlight, proper drainage, and well-devised and well-kept water-closets. If possible, some measures should be adopted to prevent the overcrowding to which nearly all tenements are liable.

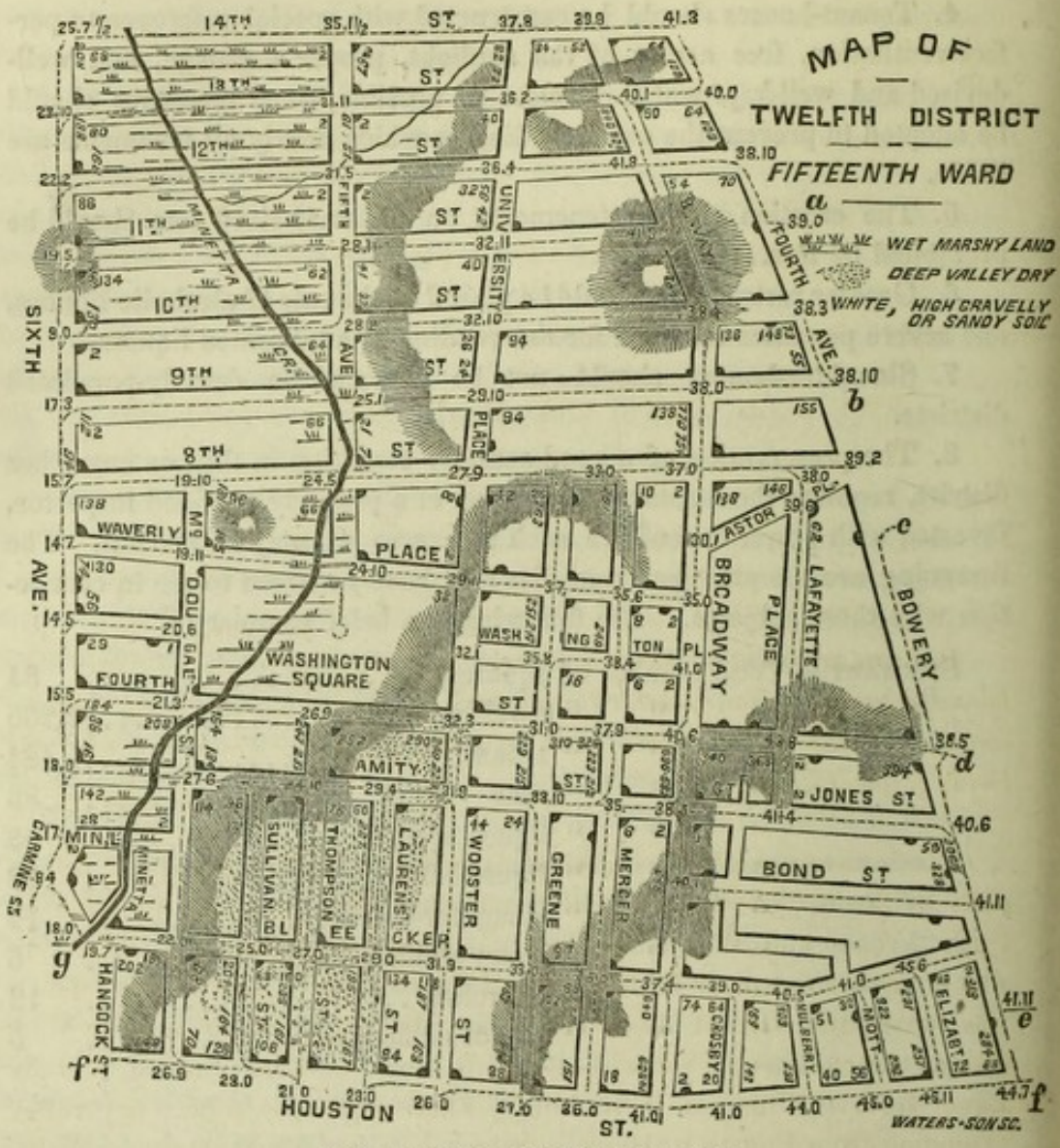
5. The erection of rear tenements on ordinary-sized lots should be prohibited by law.

6. Greater restrictions should be placed on the sale of alcoholic liquors, and severe penalties enforced for the vending of adulterated liquors.

7. Slaughter-houses should not be tolerated in densely-populated districts.

8. The preservation of a good sanitary condition in this, or any other district, requires the constant supervision of a properly qualified inspector, invested with power to enforce such measures as may be needful. The foregoing are the principal remedies that have occurred to me in connection with these subjects. The following is a brief summary:

SUMMARY.—Total number of			squares	84
"	"	"	dwelling-houses,	2,205
"	"	"	tenant "	484
"	"	"	rear "	83
"	"	"	liquor stores	83
"	"	"	liquor-selling groceries	73
"	"	"	slaughter-houses,	12
"	"	"	livery stables,	6
"	"	"	churches	13
"	"	"	school edifices	5



EXPLANATION OF FIGURES, ETC.

The interrupted lines in streets ..... represent the Sewers.

The letter *a* is on the line of a main sewer that connects with the Sewer in Second Avenue.

The letter *b* " " " connects with the Sewer in Avenue C.

The letter *c* " " " opens in the East River.

The letter *d* " " " " "

The letter *e* " " " to E. Houston Street, and opens in the East River.

The letter *f* " " " that connects on the east with the East River, and from Broadway westward, south to Canal Street and the North River.

The letter *g* is on the line of sewer that empties at foot of Clarkson Street, North River.

The black points within the squares indicate the position of the sewer culverts.

The numbers at the street intersections indicate the elevation of the street at that point above tide-level.

The numbers within the squares represent the street numbers of the corner houses.

The configuration of hills, streams, etc., illustrates the primitive topography.

THE ROYAL SOCIETY OF HEALTH LIBRARY
Formerly
THE ROYAL SANITARY INSTITUTE LIBRARY

REPORT

OF THE

TWELFTH SANITARY INSPECTION DISTRICT.

F. A. BURRALL, M.D.
Sanitary Inspector.

BOUNDARIES.—*The Twelfth District embraces that portion of this City bounded north by Fourteenth Street, east by the Bowery and Fourth Avenue, south by Houston Street, and west by Sixth Avenue. Those are also the limits of the Fifteenth Ward.*

TOPOGRAPHY.—The original surface was rolling and covered principally by farms. A "Sandy Hill" extended from near the junction of Fifth Avenue and Waverley Place eastward to the Bowery, and there was a smaller one near Broadway and Tenth Street. Art Street (which was the continuation of Astor Place into Waverley, as far as near Macdougal Street, where it joined Greenwich Lane) took its name of "Sandy Lane" from the first of these hills. There was also a deep dry valley extending from Fourth to Houston Street, between Macdougal and Wooster, and the banks were high along the upper portion of Minetta Creek. The highest street corners in the district are at the junction of Elizabeth and Houston Streets; the lowest, West Washington Place and Sixth Avenue, being respectively 45 feet 11 inches and 14 feet 5 inches above tide level.

The stream, Minetta Creek, traversed nearly the whole length of the Fifteenth Ward, and arose by an eastern branch in Fifth Avenue, between Twenty-first and Twenty-second Streets, and by a western, in Sixth Avenue nearly opposite the northeasterly corner of Sixteenth Street. The western branch took a southeasterly course to the northwest corner of Ninth Street and Fifth Avenue, receiving two small branches in the square now lying between Twelfth and Thirteenth Streets, Fifth and Sixth

Avenues. Continuing its course as far as Eighth Street, it turned in a southwesterly direction, and crossing Washington Square, passed through or very near to Minetta Street, emptying at last into the North River, near the junction of Washington and Hamersley Streets. The lower portion of the creek was also termed Bestaver's Killitje.

The eastern branch pursued a southerly direction to a point near the southwest corner of Fourteenth Street and University Place, then curving to the southwest, it crossed the junction of Twelfth Street and Fifth Avenue, and emptied into the western branch at a short distance south of the lower side of Twelfth Street, and about one-third of the distance between Fifth and Sixth Avenues. This stream, and the springs which supplied it, have been occasionally the cause of many damp and wet cellars, but this evil has been remedied to a great extent by the sewers in the cross streets.

The soil of the district is drift or diluvium; gneiss rock over granite lying beneath it at variable depths.* In Thirteenth Street, a few feet east of Broadway, gneiss was found at a distance of 20 feet beneath the surface, while a few rods west of Broadway it lay about 3 feet beneath the surface, and on the western side of the junction of Broadway and Bleecker Streets the gneiss was reached at a depth of 42 feet. In Bleecker Street, between Broadway and Mercer, after passing through 500 feet of gneiss rock, granite was found. Hence the character of the soil and elevation of its surface constitute topographical conditions which are, on the whole, very favorable to the public health.

Streets.—This district is traversed by 34 streets, including those surrounding it, which for the most part run nearly north and south, east and west, and bisect each other at right angles. The cross streets slope mainly toward the west, while the majority of those running north and south might almost be termed undulating. 24 of them have the cobble-stone pavement, 1 the Russ, 3 the Belgian, and 7 are paved partly with the Belgian and partly with cobble-stones.

Pavements.—The general surface is too uneven for rapid and thorough drainage. In many of the streets, especially those which have the cobble-stone pavement, large and small basins are found, caused by the depression of some of the stones, and these hold the surface-water until it evaporates or is absorbed by the soil. One disadvantage of the cobble-stone pavement is the fact that, from its unevenness it is cleaned with dif-

* Drift consists of sand, gravel, clay, pebbles, boulders, blocks, and irregular masses of various mineralogical characters, which are derived from the disintegration or breaking up of the superficial or exposed portion of the previously-existing rocks. These substances are sometimes united by argillacious cement, and in that form termed Hard-pan.

ficulty, and evaporation goes on much more slowly than from a smoother surface. The Russ is the most even and enduring, but is hard and slippery. During the year a large number of horses is injured by falls upon it, and accidents also happen to equestrians. On the whole, the trap-block presents advantages over any other pavement in the district, but is not without objections, since it, like the cobble-stone, is liable to become very uneven, while the spaces between the separate stones soon become filled with street soil and are cleaned with difficulty. There are no streets in the district which are kept as clean as they should be, with the exception of that part of Tenth Street between Fifth and Sixth Avenues, which is cleaned by private contract. I do not think there are any dirtier streets in this ward than Mott, between Bleecker and Houston.

Very many of the gutters are dirty, and often contain stagnant water. In one locality it is almost always present, and in another there was, but a few weeks since, stagnant water covered with a green vegetable growth. Various articles are also found in the gutters, such as mud, leaves, paving stones, railroad iron, and a great variety of rubbish. This evil of stagnant water depends mainly on the irregular grading of the gutters and their need of repairs; yet it is well known that such pools are manufactories of invisible but most unwholesome miasmata.

Streets will have the least injurious influence upon the public health when clean, dry, wide, and running in such directions as to catch the prevailing winds. In order to fully appreciate the unhealthfulness of dirty streets, it must be remembered that street dirt is composed to a great extent of organic matter. Under the influence of moisture and the rays of the sun, this matter is constantly undergoing decomposition. Whenever organic material passes through such transformations, cryptogamic vegetables are produced, which, although only visible by the microscope, are supposed to exert a marked agency in the development and propagation of epidemic disease. They are not found in the pure air of high mountains, but exist in great numbers in that of large cities. That the cause of contagion is in some instances material, is shown from the fact that during an epidemic of ophthalmia, Dr. Eiselt, of Copenhagen, discovered small cells like those of pus in the air of a ward where this malady existed, and that this cause is sometimes of a vegetable nature appears from various experiments of scientific men, among others M. Lemaire, who has recently succeeded in producing Favus by means of the parasite which accompanies that malady. Hay fever also furnishes a familiar instance of disease produced by vegetable emanations.

It seems, then, highly probable that many of "the infections that the sun sucks up" are actual matter, and that there exists an antagonism be-

tween human health and certain forms of minute vegetable life, which result from organic decomposition. Such germs are produced during warm weather, in the dirty streets of a large city, upon a vast scale. Estimating the area of the streets in the Twelfth District at one-fifth of the entire surface, and we have a hot-bed for the production of noxious vegetable miasms that is more than five times as large as Washington Square.

Hence it is of the greatest importance that the quantity of street dirt should be reduced by careful sweeping to its minimum. As moisture also favors the production of organic changes, streets should be kept so clean as to require but little sprinkling, since this, in the opinion of some of our most prominent physicians, only lays a dust which should be carried out of the city, instead of being left to form one of the materials for the generation of malaria. The sharper particles of dust are also injurious to those suffering from weak eyes or diseases of the respiratory organs.

SEWERAGE.—Of the 74 blocks contained in this district, 32 have a public sewer on each side ; 29, one on three ; and 13 have one on two sides. There is no square entirely unprovided. The drainage of Fifth Avenue and University Place is, with the exception of the square between Tenth and Eleventh Streets, accomplished by the sewers in the cross streets. The sewers are of brick, arched, and from 2 to 4 feet in diameter ; the long diameter being something less than the transverse. They receive the surface-water through the culverts (there are 133), which are usually placed near the street corners.*

The number of culverts varies in different squares. In proportion as houses are well drained from within, they are of less use, and their number might be considerably diminished. While there is no law, however, obliging landlords to connect their houses with the public sewer, there will always be much dirty water thrown into the streets in tenant districts. An objection to these culverts is, that they are outlets of miasmatic exhalations.

The drainage of the district is only comparatively good. Most of it is accomplished by the Sixth Avenue and Clarkson Street sewers. That from a part of the lower row of squares passes into the Canal Street sewer, and a portion of the sewage on the east side empties into the Fourteenth, Seventh, Fourth, and East Houston Street sewers.

It is generally admitted that the emanations from sewers are extremely injurious to health, while no one doubts that a well-drained soil is more healthful than one containing moisture. It is not uncommon even among the better classes of society to meet with cases of low, protracted disease,

* For Plan of Sewerage of the Fifteenth Ward, see the Map p. 126.

caused by a break in a waste-pipe which produced a "bad smell in the house." Experiments on the lower animals have shown that when exposed to the air from sewers, they manifest a hot skin, quick pulse, and diarrhœa, symptoms which are similar to those met with among human beings who are crowded into badly-ventilated rooms. The statistics of Salisbury, England, show that before the drainage of the town, the mortality was 20 in 1,000, since, within nine years, the mortality has fallen to 13 in 1,000. "For nine years previous to the new drainage, the births were 2,470, and the deaths 2,226, giving a majority of 244. For nine years since the sanitary arrangements, the births have been 2,624, and the deaths 1,695, giving a majority of 929. The deaths from consumption, a disease which was at one time very prevalent in Salisbury, for seven years before the drainage, were 286, and for seven years since have been 143, being a decrease of one-half." A distinguished English engineer * has also stated that "the death rates of London diminished just in proportion to the abolition of sinks and cesspools, and completeness of sewage drainage."

Squares.—There are 73 occupied squares in the Twelfth District, one of the entire number being used as a park. Of these, 45 may be classed as in a good, 7 in a bad, and 21 in a mixed sanitary condition. From this, it is evident that the majority of the population enjoys the benefits of fresh air, light, and tolerably clean streets.

Squares will be insalubrious in proportion as they are crowded, badly drained, surrounded by dirty streets, or occupied by nuisances. Some of those squares which are in a mixed sanitary condition, offer many points of interest. In them, the child of wealthy parents may hear from his comfortable bed the cries of his unfortunate brother, in the dampness and darkness of the tenant-house. The air of such neighborhoods is infected, and the occupants of the better class houses are living in a state of constant exposure to some of those contagious diseases so often prevalent in tenant-dwellings. It is not only the poor but the rich who should be interested in the sanitary condition of the city, for diseases are often raging within a stone's toss of their houses, which if known would fill them with anxiety. A short time since small-pox existed in a tenant-house in this district, which stood at the end of the yard of one among a row of better class houses.

As an instance of a square in a mixed sanitary condition, take one from the record-book in which there are of dwelling-houses 47. Rather more than 120 families are contained in 19 of these houses; and estimating 4 to each family, we should have a population of 480 souls living in

* Robert Rawlinson, Esq.

what might be termed a corner of the square. The remaining 26 dwellings contain, on an average, about 7 persons to each house, or 168 for the remainder of the square. These latter are constantly exposed to the exhalations and diseases which are the accompaniment of the more crowded neighborhood.

POPULATION.—Most of the population of this district is native-born, and the remainder is composed of foreigners and negroes. The census of 1860 gives the following result:

Population of the Fifteenth Ward.

	WHITES.	FREE COLORED.	TOTAL.
Males,	12,429	332	12,761
Females,	14,380	446	14,826
Total,	26,809	778	27,587

The style of living in this population, presents every variety from luxury to poverty, and almost every branch of industry is represented. A calculation gives about 70 square feet as the ground area for each person, exclusive of the area of the streets. As, however, some of the tenant population have but 15 square feet of ground area, the total is very unequally divided. It is the healthiest ward in the city, having a mortality of rather less than 1 in 60; and it may not be out of place to state, that in the recent municipal election, it gave a majority in favor of reform. It is a district of strong contrasts, where the rich and poor, healthy and sick, meet together, where better class houses are every year becoming metamorphosed into tenant-dwellings, and where the greatest refinement and most stolid indifference are found respectively in the mansion and the cellar.

BUILDINGS.—There are 2,996 of all kinds of buildings which are wholly or partially occupied, as follows:

Better class dwellings,	1,380
Tenant-houses containing three or more families,	198
Dwellings resembling tenant-houses,	190
Stores on Broadway, 2 sides,	212
" " Fourth Avenue and Bowery, 1 side,	129
" " Sixth Avenue, 1 side,	94
" " Bleecker Street, 2 sides,	73
Drug stores,	16
Groceries,	49
Shanties,	4
Gambling saloons,	17
Concert saloons,	7

Brothels and assignation houses,	76
Livery stables,	29
Private stables and stalls,	161
Drinking shops,	234
Lager bier saloons,	23
Policy shops,	22
Station house,	1
Hotels.	14
Theatres,	4
Public schools,	3
Public library buildings,	3
Theological seminary,	1
Churches,	16
Synagogue,	1
Half-Orphan asylum,	1
Asylum for juvenile delinquents,	1
Slaughter-house,	1
Soap and candle factory,	1
Markets,	18
Engine-houses,	4
Factories,	48
Home for young women and children,	1

Better Class Residences.—Of the various dwellings, 1,380 are included under better class residences. These vary much in character, but there are few which cannot be termed comfortable, and many are luxurious. It is well known that there is no city in the world where there are so many handsome private residences as New York, and some of the finest in the city are to be found in this district. Those in the upper portion are mostly new, built of brick or brick with facings of brown sandstone, are spacious, well drained, and supplied with gas and Croton-water. They are heated by stoves, grates, or furnaces, in which soft or hard coal is burned. Unfortunately the supply of water is still deficient, which is accounted for by the fact that although there is enough in the reservoirs, the supply pipes or mains are not sufficiently numerous. A bath-room and water-closet are considered essential to every house. The garbage is kept in an "ash-barrel," and removed by the street-carts. Sometimes a delay occurs in the removal, and then quite an offensive smell is produced. As a general rule, the improved modes of ventilation as at present understood have not been specially considered in the construction of these houses, and they are often kept too warm in winter. Bad odors occasionally occur in better class residences, as a consequence of the traps being too shallow.

TENANT-HOUSES.—197 tenant-houses contain 3 or more families. A different classification would, however, increase this number materially; for including small houses, which resemble tenant-houses in deficiency of ground area and cubic air-space, containing only two families, and better class houses which are let out by rooms to a tenant-class population, and we have 388 dwellings which might fairly be termed tenant-houses.

The 197 tenant-houses contain 1,396 families or 4,940 persons, and a cellar population of 51 families or 234 persons. Of these:

18	houses	contained	3	families.
43	"	"	4	"
22	"	"	5	"
35	"	"	6	"
11	"	"	7	"
30	"	"	8	"
4	"	"	9	"
12	"	"	10	"
3	"	"	12	"
1	"	"	14	"
1	"	"	15	"
4	"	"	16	"
2	"	"	17	"
5	"	"	18	"
1	"	"	19	"
1	"	"	20	"
1	"	"	21	"
2	"	"	24	"
1	"	"	26	"

The means of escape from fire was good in 118, bad in 79.

There were sewers for 124, none for 73.

In 8 cellars each person had, of cubic air-space from

				200	to	400	square feet.
55	"	"	"	400	"	600	"
60	"	"	"	600	"	800	"
28	"	"	"	800	"	1,000	"
34	"	"	"	over		1,000	"

In the rooms above the cellar each person in

10	families	had of	cubic air-space	from	200	to	400	square feet.
55	"	"	"		400	"	600	"
70	"	"	"		600	"	800	"
28	"	"	"		800	"	1,000	"
34	"	"	"		over		1,000	"

Of these tenant-houses 14 are of wood, 69 are rear buildings, and 25 have no rear windows.

The fact that 1,000 cubic feet of air-space is considered as the least allowance necessary for every adult person, and that residents in first-class houses enjoy from 2,000 feet upwards, shows that the majority of a tenant-population has not the stimulus of fresh air to assist in bearing their other surrounding discomforts or resisting disease.

The relative sanitary condition of a good private dwelling and a tenant-house may be illustrated by the following comparison:

	Private dwelling—(medium).	Tenant—(rear).
Area covered by house sq. ft.,	20 by 40 (3 stories and basem't),	20 by 25 (4 stories).
No. of inmates,	8 persons (1 family),	8 families (30 to 40 souls).
Area of yard and court,	20 by 30,	12 by 20.
Ground area, each person,	100 square feet,	15 square feet.
Sewerage,	Drains and traps,	None or hydrant and cesspool.
Cubic air-space, each person,	4,000 cubic feet,	400 cubic feet.
Light or dark,	Light,	Dark, in halls and bedrooms.
Hygrometric conditions,	Dry,	Damp.
Ventilation,	Tolerable,	Bad.
Nuisances,	Dirty streets,	4 privies in court.
		Garbage-box.

As an instance of the insalubrious conditions under which some of the inhabitants of this district live, may be mentioned three rows of tenant-houses situated between Broadway and the Bowery, on a space of 8,100 square feet, or a little more than three full lots (see diagram), which contain 352 person. This gives a ground area of 23 square feet to each individual.

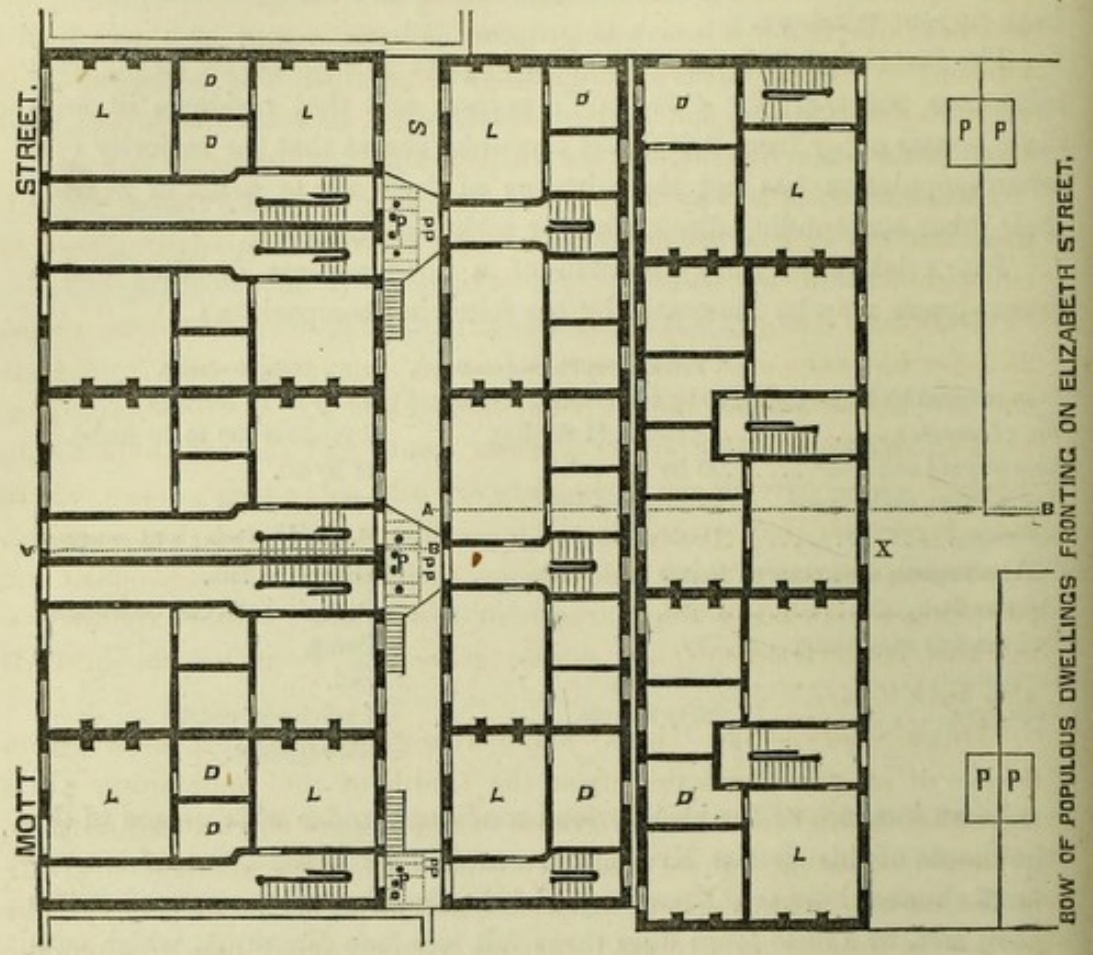
Between the front and middle houses is a space of about six feet, between the middle and rear one foot. The lower rooms of the middle row, which has five stories above the basement, are very damp. The sun never reaches them. Leather soon becomes mouldy there, and within three feet from each hall door are three privies.

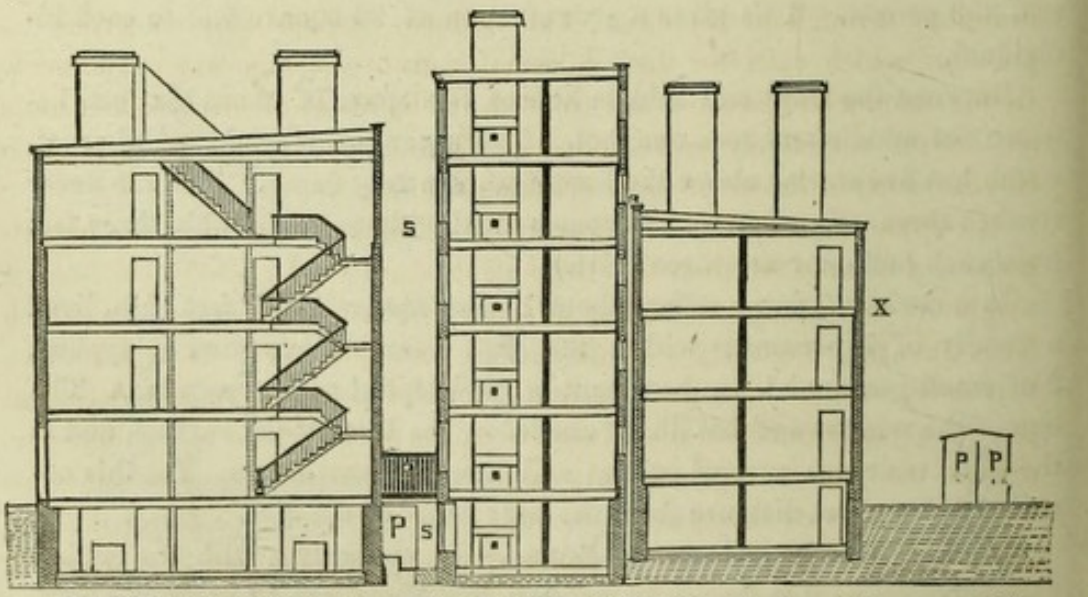
In a dark and damp cellar, about 18 feet square and 7 feet high, lived a family of 7 persons; within the past year 2 have died of typhus, 2 of small-pox, and 1 has been sent to the hospital with erysipelas. The tops of the windows of this abode are below the level of the surface, and in the court near are several privies and a rear tenant-house. Yet this occurred but a short distance from the very heart of the city.

Courts, Alleys, Garbage-Boxes.—In connection with the subject of tenant-houses it is proper to mention that there are 12 garbage-boxes, 24 courts, and 95 alleys in this district.

Some of the garbage-boxes are extremely disgusting, both in smell

FLOOR PLAN OF AN OVERCROWED TENANT-HOUSE.





TRANSVERSE SECTIONAL VIEW OF THE ROOKERY.—See Description on page 135.

L L (in Floor-Plan) the Living-Rooms.
D D " " Dormitories.
S S (in both Plans) the space (6 ft.) between Front and Rear Tenant-houses.
P P show the location of the line of subterranean Privies.
S the Stairway to them.
X another Row of Tenant-houses east of, and back-to-back to these.

and appearance. They often remain unemptied for days, and this in hot weather, and the result is a heterogeneous stew worthy of the "devil's kitchen." * These boxes should always be provided with covers, emptied every day in summer, and whitewashed every week on the inside, until some better method is adopted for the disposition of garbage.

Many of the alleys are damp, and have small gutters running through them into the street. Some of the courts are also damp and exposed to emanations from cesspools.

Drinking Shops, Saloons, Brothels.—There are 234 dram shops, 23 lager bier saloons, 17 gambling saloons, 7 concert saloons, 76 brothels and assignation houses, and 22 policy shops in the limits of this inspection.

The drinking shops are of various kinds, and may be divided into "bars," where only liquors and segars are sold, lager bier saloons, where more lager bier than strong liquor is consumed, and with less rapidity. Ale-houses similar to lager bier saloons, though generally more quiet and partaking somewhat of the character of restaurants; billiard rooms, restaurants, concert saloons, and corner groceries. Some of the brothels also have "bars."

Dram-Shops.—The "bars" and corner groceries exert the worst influence of all these varieties upon the health of the community. It is there that the higher and lower grades of tippling are carried on, and large quantities of strong liquors hastily consumed at unseasonable hours. It is the custom with some to drink ardent spirits in the morning for the purpose of bracing up a relaxed nervous system, and others continue the draughts throughout the day. This induces dyspepsia or a nervous depression, which calls for the additional spur of a temporary excitement. In this manner bad passions are aroused, and habits of inebriety and chronic alcoholism very likely to be induced. The recent homicide in Hudson Street occurred in one of these drinking saloons.

Corner Groceries.—The corner groceries are found near the tenant-houses. It may be that the depressing causes which exist in such a neighborhood prompt to the use of some "oblivious antidotes," by which for a time the rough edges of life may be smoothed over. It may be, too, that these stimulants exert a certain degree of prophylactic influence, but the quality of liquor obtained in such places is injurious to the digestive organs, the brain becomes unduly excited, and quarrelling or even murder results. Probably the general health of society would be better without ardent spirits, and there is no doubt that the introduction of cheap and pure wines containing a small percentage of alcohol would be a great boon to the community.

* The popular name given to a tripe-boiling establishment in the upper part of the city.

BROTHELS.—It being for the interest of the inmates of brothels to pay strict attention to neatness and personal cleanliness, these buildings are not overcrowded. They vary in character from the quiet assignation-house, to the gaudy brothel and low resort of prostitution. In some parts of this district prostitution is carried on under the guise of segar selling.

It has often been urged that such houses, and in fact the whole matter of the "social evil," should be placed under legal and medical supervision, as in many other cities. This seems to be the most efficient method for preserving society from the ravages of a pernicious and inveterate disease, thus only acknowledging what is every day forced upon the public notice, while practically giving it less encouragement than it at present enjoys.

STORES, MARKETS, ETC.—Most of the stores in this district are on Broadway, the Bowery, Sixth Avenue, and Bleecker Street. In these thoroughfares there are 508, and in the entire limits of this survey the number would rise to more than 600. There are 69 drug stores, 49 groceries of all kinds, and 18 markets. Most of the stores are commodious, and some very spacious and elegant. The drug stores are mostly of the better class, and the markets generally well kept private markets. I do not know of any instance in this district where poisons have been dispensed by druggists without the prescription of a physician.

FACTORIES.—There are piano, cabinet furniture, trunk, sewing-machine, chocolate, carriage, ornamental composition, photographic materials, and hoop-skirt manufactories in the Twelfth District, but they do not at present call for special consideration.

STABLES AND SLAUGHTER-HOUSES.—There is 1 slaughter-house which is in rather a dilapidated condition, 1 soap and candle factory, 29 livery, 1 veterinary, and 163 private stables and stalls. The majority of stables is private, and very many are neat and most carefully kept. In some parts of the district the pavements in front of them are, however, much obstructed. It will be noticed that their number is large, and much originality has been shown in providing for the equine population of the district. Sometimes above ground, often under ground, and again in little stalls or stables like inverted boxes, does this indispensable animal find shelter. The large private stable in Amity Street near Wooster is clean and well ventilated, and there are many handsome private stables attached to better class houses. It is said that horses in subterranean stables are delicate, take cold easily, and often suffer from "scratches."

CHURCHES, INSTITUTIONS.—Of the 16 churches, one is attended by colored people; there are 3 public schools, 1 synagogue, 1 half-orphan asylum, 1 asylum for juvenile delinquents, 3 public library buildings, 1 temporary home for young women and children, 1 theological seminary, and 1 university.

In the construction of the churches there does not seem to have been a special reference to the improved methods of ventilation. This is compensated for to a great extent by high ceilings and spacious interior. During the summer the heated air finds ingress and egress through the open doors and windows, but in winter the atmosphere is somewhat confined.

It is admitted that the ventilation in the public schools is defective since the demand for education among all classes is very great; but in this district these institutions are under the control of intelligent and public spirited men, who desire to remedy such evils as far as possible.

The Half-Orphan Asylum and Asylum for Juvenile Delinquents are not overcrowded; there are clean well ventilated dormitories in the Half-Orphan Asylum, and the sanitary condition of the children there is excellent.

The Home for Young Women and Children is similar in its good objects, and connected with the House of Mercy in Eighty-sixth Street.

Vacant Lots, Grave-yards.—There is 1 small grave-yard and 1 Jewish burying-ground, 15 vacant lots in a good sanitary condition, and 1 park or Washington Square.

This square, a portion of which was formerly Potter's Field, contains nearly 10 acres. It is used as a playground and public walk, also for military and police drills. In summer, the trees which it contains are infested with worms. It is probable that trees exert a purifying influence upon the atmosphere, since they exhale ozone, that remarkable substance which is now admitted to be Nature's great disinfectant.

This park increases materially the amount of cubic air-space in this portion of the district.

Prevailing Diseases.—Since the commencement of the survey, scarlet fever, typhoid fever, small-pox, and cholera infantum, have prevailed in the tenant-houses of this ward. Six cases of small-pox occurred in one of three thickly-peopled rows of such dwellings, and the disease was communicated to a child living in an adjacent street, who had been playing in the infected neighborhood. Seven cases of typhoid also occurred in a court among children, and this was within a few doors of better class houses. A little child also died of scarlet fever a few months since in a better class house, which was near a tenant neighborhood, where the same disease had existed a short time previously. This, however, may have been only a coincidence.

There is a great comparative indifference to contagious maladies among the inmates of tenant-houses, and much carelessness as to prophylactic measures on the part of landlords. It sometimes happens that ten-

ants move into rooms where small-pox has raged but a few weeks before, without knowing that this disease has existed there, and these rooms are not disinfected during the continuance of the malady, or after it has run its course.

At the commencement of the inspection, it was a source of much surprise that so many localities which apparently contained all the elements for the generation of malaria, should be so free from disease. Certain houses were described as "Insalubrious Quarters," in which the occupants were nevertheless comparatively well. But when the hot months came on, and the sun called out the lurking miasms, then disease showed itself in these poisoned abodes, and the effect was thus associated with its cause.

Most of the complaints reported to the Association have received the attention of the Sanitary Police, and there seems a disposition on the part of that body to remedy existing evils as far as is practicable.

But the present health organization of the city is inadequate to maintain a constant supervision, and a more comprehensive system is necessary, corresponding to the advancement of sanitary knowledge and the wants of a large and rapidly-growing city.

Although this district includes the healthiest ward in the city, its sanitary condition, as will have been seen from the previous pages, is only comparatively good, and it is believed that the average number of diseases and deaths which occur annually within its limits, might be still further reduced. It would be improved by

Necessary Improvements.—1. Cleaner streets and gutters; the streets to be kept constantly clean by men and carts going through the different streets, as is done in other cities, instead of a periodical "cleaning up."

2. A more complete system of sewerage.

3. The erection of model tenant-houses. And here it is proper to speak against that indifference as to the welfare of the poor, which is often observed among the better class; a shifting of those responsibilities which always must press upon the shoulders of the influential members of a large city under a republican form of government, unless they are willing to allow the best interests of the city to fall into unworthy hands.

The tenant-population is deprived of light and air because of the want of good houses and not from choice, for there is not a doubt that model lodging-houses would be easily filled, and that they would prove remunerative. The effect of such buildings would be seen in an increased morality and diminished death-rate.

4. Liquors should not be sold without a license.

5. The *social evil* should be placed under legal and medical restraints.

6. It is believed that the packing of street cars is also a cause of the propagation of disease, since persons in these conveyances are often brought into very close contact with those suffering from contagious maladies. Seventy-five passengers have been counted riding upon one street car at the same time, while there are only seats for twenty. Serious injuries also sometimes occur to those getting on or off, and one or two individuals have lost their lives by being run over during the past year.

7. Public urinals are also necessary in large cities. As constructed in Paris they disfigure the public thoroughfares and offend public decency; but such places might be built in the rear of small stores, thus removing every objectionable appearance. Some points in this district suggest such an improvement.

It is also a fair question whether animals for slaughter should pass in droves through our principal streets, sometimes filling the air with a disagreeable smell, injuring their meat in hot weather, and occasionally running a muck through the town, when thirsty and overheated. Fast driving of horses, although less frequent since the occurrence of fatal results, has not entirely disappeared.

Is it necessary to add, that the care of the public health should be under the supervision of a well-qualified body of medical men, sufficiently numerous to keep a constant watch over all sanitary affairs, and associated with a police force who could carry out such sanitary measures as were necessary for the public welfare.

It will read strangely by and by that for many years the health of the city was under the control of those who, in some instances, were not especially familiar with the laws of health, and in many quite ignorant of them. It seems only natural that those to whom society commits its individual health, and whose time is occupied in the study of disease, would be the most efficient guardians of the health of a community.

REPORT

OF THE

THIRTEENTH SANITARY INSPECTION DISTRICT.

ROBERT NEWMAN, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Thirteenth District comprises the western half of the Seventeenth Ward, and is bounded on the north by East Fourteenth Street, east by the First Avenue, including both sides of said avenue, south by Rivington Street, and west by the Bowery.*

EXTENT OF AREA.—Measured throughout the exterior lines of its boundaries, the area of this district covers 8,396,648 square feet. In the early history of the city this district was embraced in three adjacent farms: The "Van Cortlandt Farm," extending northward to the line of Houston Street; next the "Minthorne Farm," extending to Sixth Street; and, lastly, north of Sixth Street the "Stuyvesant Farm," covered the balance of this district and much more beyond it.

GEOLOGY.—The diluvium or drift constitutes the principal external feature of the geological formations here. Beneath this drift of silicious clay, etc., is the broad and distorted underlying rock of the island, gneiss, and which at the present grade of the streets is found at various places at a depth of about 18 feet below the surface.

TOPOGRAPHY.—The whole district is elevated ground; the character of the soil is sandy. Around Stanton and Rivington Streets particularly, the best sand for building purposes was found. A few lots have been filled in with earth from 4 to 6 feet. The only exception in topographical character was a marshy ground on the "Peter Stuyvesant Farm," which extended from a little below Thirteenth Street to Fourteenth Street, and from First Avenue a little beyond the Second Avenue. A brook passed this locality from west to east, and finally emptied into the East River. About twenty years ago this swamp was filled in with earth for a little

more than 10 feet in depth. The original elevation was here 10½ feet; at present it is 21 feet, and the lowest point in the district. Several wells and springs have existed in different parts of the district, which have been gradually covered. The last wells were covered in 1861, and were situated as follows: Corner of Second Avenue and Fourth Street, Second Avenue and Third Street, and First Avenue and Sixth Street.

The *natural drainage* of the district is good; the west side at Bowery and Fourth Avenue is highest, varying in height in several places within 6 feet, gradually sloping toward First Avenue. The greatest elevation is at the corner of Stanton and Bowery, being 45 feet. The lowest locality is First Avenue and Fourteenth Street, 21 feet, and continuing a few blocks south.

The elevations in Bowery and Fourth Avenue vary between

			38 ft. 3 in.	to 44 ft. 11 in.
"	"	Third Av. vary between	34 ft. 2 in.	to 37 ft. 6 in.
"	"	Second Av. " "	27 ft. 8 in.	to 40 ft. 11 in.
"	"	First " " "	21 ft. 0 in.	to 35 ft. 4 in.

While the city of New York has been so favored by nature in regard to situation, that it ought to be one of the most salubrious cities in the world, this district has the greatest natural advantages for health of any within its limits. With proper sanitary regulations in full operation zymotic diseases would not here be known. The elevation, the good natural drainage, the sandy, high ground, combine topographically and geologically all the natural elements of salubrity.

STREETS.—The streets run regularly, being laid out in avenues from south to north, and in streets from west to east, excepting Stuyvesant Street, which runs diagonally between Ninth and Tenth Streets. The avenues and Fourteenth Street are 100 feet wide, the numerical streets and others running in the same direction are 60 feet wide. "Extra Place" is 27 feet wide. The alleys and courts differ much in width.

The streets are generally paved with cobble stones. Belgian pavement is in the Bowery, Fourth Avenue, St. Mark's Place, and Houston Street; the latter just finished. The gutters in the ennumerated streets are most cleanly and well drained by the inclination of their planes, but on the *avenues* the unevenness and general inclination of their planes render the gutters extremely unclean by the collection of water and garbage in the depressions. At certain places, especially in the neighborhood of factories, large stores, and stables, the gutters are covered to afford smooth passage to vehicles; these coverings obstruct the gutters and increase the accumulations, generating foul emanations and musquitoes. This is es-

pecially noticeable in Christie, Rivington, and Stanton Streets. The residents of No. 16 Rivington complained that in consequence of such obstructions and deficiencies of drainage, water accumulates in their cellars during the winter. The whole of this block is filthy. The corners of this street at Christie and Forsyth are particularly filthy. In Christie heaps of garbage are always found. In Forsyth, notwithstanding the efforts of the residents, the deficiency of drainage and accumulated filth from the neighboring slaughter-house and establishment for preparing calves' heads, cause a most troublesome nuisance.

The gutters in Eldridge Street are out of repair. The sidewalk in Stanton, between Eldridge and Allen, is in a miserable condition, nearly every flagstone being on a different plane. The drainage before No. 22 Stanton Street is in such a state that the residents cannot keep the gutters clean. The pavement is poor in many places, particularly in First Avenue and some places in Second Avenue. At the corner of this avenue and Sixth Street the pavement has given way, causing an excavation dangerous to travel. Fifth Street, near Bowery, is very dirty, and needs repairs. The two following localities present the appearance of dung-hills rather than the thoroughfares in a civilized city, viz.: Sixth Street between Bowery and Second Avenue, and Eleventh Street between First and Second Avenues.

Sewerage.—No community and no city can preserve a wholesome condition without a thorough supply of pure water, and an equally thorough purification from all refuse. To properly arrange this double circulation in a large house, is a matter of no trivial consideration; how much more, then, is skill, sagacity, and system, necessary for the sufficient supply and drainage of a district of an immense city like New York? Houses may be built on as many different plans as the fancy of owners or the skill of builders may desire; blocks may be large or small; streets and avenues straight or curved, regular or irregular, as may suit the circumstances of proprietors; but the distributions of pure water and the removal of impurities by sewerage, must be effected according to a logical plan and system. The laws of nature and the rules of art will only give success in this department. It is not enough to empty the slops of one room into the common sink, nor the filth of one house into the common privy or waste-pipe. The sewerage of each room and house must be accurately estimated before it enters the common sewer of the block, and that sewer must be of a capacity sufficient for all the houses feeding it. But that is not all; the street sewer must find an ample reservoir, and the reservoir must find instant conduit by the general channel to the river. Nor should the solids lie in the corners and on the shore, while

the fluids find difficult passage into the river current. Perpetual motion, and sufficient outlet, are the grand principles of a good sewerage. Heavily laden water will not turn sharp corners, run up hill, nor force impossible outlets to suit the ignorance, caprice, or stinginess of any individual or community. Nor is it sufficient to plan and execute a complete system of sewerage for New York *as it is*, but rather for New York *as it will be*. If a sewer, a culvert, or conduit is sufficient to-day, it will be impassable to-morrow; for there will be another house to drain. From our observation and reflection we can but conclude that, to devise and put in operation a system of sewerage adequate to the necessities of this city, is a problem to be solved only by the most skilful students of civil engineering.

The original plan of sewerage for this city was adapted only to a village; that plan, barely sufficient at the outset, has never been enlarged nor considerably improved. Additions merely have been made from time to time, which have resulted in the greatest confusion. There are houses with no sewer, privies which overflow into the yards, vacant lots converted into cesspools, streets ankle deep with filth, for which no outlet ever was contemplated. Another fault is, that the sewerage has been constructed at different times, by different persons. One district has been drained by a contractor, who was utterly ignorant of the condition of the sewerage in the adjoining district, and the sewer from one block has been let into the sewer of another, without a thought as to the capacity of that sewer to perform its double function. If the constructor only got the filth out of sight *somewhere*, his contract was finished, and the city was drained! A large amount of water is led into a conduit entirely too small; sewers are constructed on a level, or even on an ascending plane. A sewer 14 feet in depth empties into another of but 12 feet, and six houses are so drained that, if an obstruction is caused by one house, the other five are not drained at all. This is owing to the wretched economy of speculators, who built houses with no regard to their connection with the street sewer.

There is no provision for cleaning out the sewers. In the winter the abundant rains and the water from melting of the snow is carried into the sewer, and they are thus partially cleansed. But in the summer, when filth collects most rapidly and decomposes so readily, little rain falls and the sewers are uncleaned sometimes for weeks. There are no means of flushing them, and hence where the solids prevail in the drain a foul and pestilential atmosphere is generated during the worst months of the year. The same lack of system which prevails in the construction of small and main channels also holds in the outlets. These outlets are intended to diffuse the contents of the sewers into the river currents; but in many cases the

outlet is so much above high-water mark, that while the fluids run away the solids lie on the shore, diffusing pestilence and sickness into all the neighborhood. Other outlets are so far below the water-level, that when the tide is high, the sea-water fills the sewer and forces back the filth. The result of this tidal influx is the overflow of cellars and privies in the neighborhood; the regurgitation or reflux of gases and foul emanations by the privies, basins, and sinks, even far removed from the water-side. For many blocks toward the centre of the city this dangerous recumulation sends its evil influences in the shape of foul odors and offensive privies.

In the neighborhood filled by tenant-houses of the lower classes the waste-pipes from the privies into the sewers are often obstructed by garbage, ashes, and dead animals. This evil requires some special provision of grating and facilities for removal. In regard to the size of sewers constructed in 1862 the dimensions are 4 ft. × 2 ft. 8 in.

Sewerage of the District.—All the enumerated streets with Houston, Stanton, and Rivington, are sewered, except a part of Twelfth Street, between Second and Third Avenues, where there is a private sewer, which connects with the public one.

The following Localities have no Public Sewer:

Part of Twelfth Street between 3d and 2d Avenues.
Fourth Avenue " 7th " 9th Streets.
" " " 10th " 11th "
" " " 12th " 13th "
Third Avenue " 7th " 9th "
" " " 10th " 13th "
Second Avenue between Houston " 3d "
" " " 8th " 9th "
First Avenue " Houston " 12th "
" " " 13th " 14th "
Christie Street " Rivington " Houston "
Forsyth " " Rivington " Stanton "
Eldridge " a small part near Houston "
Allen " between Stanton and Houston "
Stuyvesant Street entirely.
Extra Place entirely.

There are private sewers in Christie Street, Nos. 181 and 183; in Third Avenue near Tenth Street, and in the same avenue near Twelfth Street, the houses Nos. 72, 74, 76, 78 have *one* sewer, which runs from

their yards and the stable No. 100 East Twelfth Street, and empties into the Twelfth Street public sewer. This is one of the badly-constructed sewers, which often is blocked up, and has given rise to much trouble and inconvenience to the parties concerned.

Second Avenue provision-house, Nos. 10–14, connects with First Street.
" " Nos. 6 and 8 connects with Houston Street.
" " Nos. 17–27 have only one sewer.
" " between 8th and 9th Streets are good sewers.
Stuyvesant Street to 9th and 10th Streets.
First Avenue Nos. 121 and 123 connects with 8th Street sewer.
" " Nos. 143 to 151 " " 10th " "

In Bowery and in streets below First Street, only a few houses are connected with the sewers, and these are mostly tenant-houses. In First Street, No. 16 to 26, the houses have only one sewer, and belong therefore to the class mentioned before.

SQUARES.—There are in this district 44 squares, besides the blocks on the east side of First Avenue, between Houston and Fourteenth Streets. There is great variety in regard to the sanitary conditions of the same square as well as in different squares.

First Avenue is mostly in a bad sanitary condition, and the streets are dirty in consequence of municipal neglect and the presence of the large population, who live mostly in tenant-houses. Second Avenue has mostly first-class dwellings. The streets between the avenues present a great variety of conditions. Near the corner of Second Avenue and Sixth Street, fashionable houses, cattle-yards, and markets, and the worst slaughter-house in this district, are promiscuously mingled. In Eleventh Street, again, we find in the same square first-class houses, and overcrowded tenant-houses of the lowest order, with the great fever-nest of the district.

In general it can be stated, that the upper part of the district above Seventh Street is in the best sanitary condition, except First Avenue, and Eleventh Street between First and Second Avenues. The lower part below Sixth Street is in a mixed condition.

INHABITANTS.—Private families that have a whole or half a house as a residence, are 2,107. The laboring classes living in tenant-houses, number about 5,872 families; making a total of 7,979 families in the district. The whole population is estimated about 39,890 persons. In the Bowery, Fourth Avenue, Third Avenue, and First Avenue, almost every house is occupied by a store or business of some kind; the upper portion of such houses are used for dwellings.

In Second Avenue are private residences exclusively. In the enumerated streets above Seventh Street are mostly private houses; below Seventh Street mostly tenant-houses, with some slaughter-houses and factories mixed. Houston Street, and below that street, shopping business, factories, tenant-houses, and private dwellings are intermingled in strange variety.

In regard to peculiarities, classes, prevailing character and nationality, the streets give a better key for tracing them out than the squares. For instance, the First Avenue is inhabited to Second Street by Americans, with few Germans. Between Second and Sixth Streets, we find Germans exclusively in large tenant-houses; Sixth to Seventh Streets a mixed population of Americans, Irish, and Germans; Seventh to Eleventh Streets Irish prevailing, with Germans scattered; Twelfth to Fourteenth Streets Irish exclusively; Eleventh Street, between First and Second Avenue, Irish entirely; below Third Street is a mixed population, with Germans prevailing; Sixth Street, between First and Second Avenue, almost entirely Germans; Second Avenue, and the enumerated streets above Seventh Street, Americans prevailing, with many Germans scattered; Third, Fourth, and Fifth Streets, a mixed population. Colored people live scattered around the district in rear buildings and alleys.

BUILDINGS.—Classification of buildings.

Private dwelling houses,	1,204
Tenant Do.,	734
* Stores, factories, shops, etc.,	123
Slaughter-houses,	38
Packing-houses, fat and hides, etc.,	17
Churches,	14
Schools,	7
* Hotels, saloons, armories, etc.,	48
* Stables,	116
Miscellaneous (not specified here),	53
Total buildings in the district,	2,354

Within this district are 46 courts, 160 alleys, 272 rear buildings.

PRIVATE DWELLINGS.—Of the 1,204 private dwellings, we find the

* The lines with a * show not the *whole* number of those establishments in the district, as many buildings are used for several purposes. For instance, a single building may be occupied in part by tenants as a dwelling, while the other portions are used as a factory, shop, store, market, and stable. The above table is only a classification of buildings, while specification of other establishments are prepared under their respective heads.

frame buildings 21, frame with brick front 44. The remainder are mostly substantial brick buildings, of which a large number have brown stone fronts.

These houses vary considerably in size, but are mostly 22 × 25 feet front, and 52 feet deep. A few narrow houses have been built recently at corners, which in some instances have a front of only 12½ feet, and scarcely any yard attached. Most of these dwellings are comfortable, even luxurious, and have all the modern improvements. Some exceptions to this rule are found in First, Third, and Fourth Avenues, and the Bowery. The old-fashioned dwellings, without any convenience or modern improvements, are all situated in the lower part of the district below Fourth Street.

Tenant-Houses.—The whole district presents great variety in the location of tenant-houses, the best and the worst mingling in close proximity. Some squares show this variety to such a degree that scarcely two buildings can be found alike. And in the same manner we find the tenant-houses scattered throughout the whole district except on Second Avenue.

There are rows of tenant-houses recently built in Fifth and Sixth Streets between First and Second Avenues, and in First Avenue. Old-fashioned tenant-houses, in bad repair, are found principally in the following localities: 1st. Between Rivington and Stanton, Christie and Bowery. 2d. Between Houston and First Streets, Bowery and Second Avenue. 3d. A row of old houses in Eleventh Street, between Third and Fourth Avenues. These buildings are in a miserable state, old and out of repair, some stairs dangerous to pass, foundation of privies falling away, and the ground saturated with fæcal matter.

Most of the tenant-houses are built of brick; one, 217 Bowery, has a white marble front. There are frame buildings 68, frame with a brick front 51.

The tenant-houses vary much in size; the fronts from 16 to 25 feet, the depth 40 to 52 feet: some exceptions of course occur. The sizes of the family apartments differ in various places very much, and have been given exactly in the different special reports. Among the different arrangements of family apartments, the following are worth mentioning: 1. One family occupies one room and one bedroom. The room has two windows, but the bedroom is dark in most cases, without any ventilation. Such bedrooms are generally 8×5 feet, or 8×8 feet, or 9×7 feet. Often four such family apartments are situated on one floor, by which arrangement the stairs and halls necessarily must be narrow and dark. 2. One room with two windows and two bedrooms. The bedrooms of the same size as before, but according to circumstances one or both with windows.

These first and second classes of family apartments are generally in tenant-houses, built expressly for such a purpose. 3. One room with two windows, one room with one window, and one dark bedroom. This arrangement is found mostly in houses which have been private dwellings formerly, and have become tenant-houses since the up-town movement of fashionable people. In such cases two families are on one floor, each occupying respectively front or back part. 4. Two rooms and one bedroom. The arrangements of such rooms differ in some respect, and are rather exceptions. 5. Two rooms and two bedrooms. In such a case we find almost always two families on a floor, which is divided into two lateral halves. The apartment is generally $12\frac{1}{2} \times 52$ feet more or less, ceiling 8 feet high, and is divided into a front and back room, each with two windows. Between these two rooms are two bedrooms, which are generally dark, and receive light and air by the two other rooms.

If the two bedrooms have windows and good ventilation, they become the best apartments in a tenant-house which can be found at present.

The best idea of the size of these rooms, and their population, the following figures will give, particularly in certain localities.

Ground-area to Each Person in Tenant-Houses.—In the Bowery, Christie, Rivington, and Stanton Streets, there was found to be to each inhabitant 28 square feet. In Nos. — and Nos. — Eldridge Street, $12\frac{1}{2}$ square feet. These are lowest averages of area allowed to a tenant population in my district. At various other and more favorable localities, I found a *pro rata* of from 30 to 80 square feet for each inhabitant.

Cubic feet of air to each person.

Rivington and Stanton between Bowery and Christie,	360, 460, etc.
" " " " Christie and Forsyth,	576, 792, "
" " " " Eldridge and Allen,	432, 566
Stanton and Houston " Forsyth and Eldridge,	566
Third Avenue, No. —,	336
Fourth and Third Avenues between 12th and 13th Streets,	473
No. — E. 13th Street,	392
Second and First Avenues, Houston to First Street,	534
" " " between 10th and 11th Streets,	392
" " " " 11th and 12th "	432

Croton-water is in all the yards, and in more than half of the tenant-houses on all floors. But in the larger half of these houses, the tenants have not many conveniences therefrom. Either from want of pressure, scarcity of water in reservoir, or fault of mechanical structure and re-

pairs, the water is not found in the house at all, or not above the second story.

Imperfect drainage of streets, gutters, and houses, has in many places a marked influence on tenant-house population. The filth accumulated is increased in consequence of the uncleanliness that prevails in those places. Perhaps one-half of these houses have well-arranged drainage pipes throughout, for the removal of house-slops, which arrangement works well if the sewerage is good, and the sewers not blocked up. But if the former evils are superadded to bad sewerage, the locality is rendered insalubrious by foul emanations, stagnant water, etc. The tenants of the houses without house-drainage generally throw their house-slops indiscriminately anywhere into the streets, alleys, courts, yards, and sometimes even into cellars and passages.

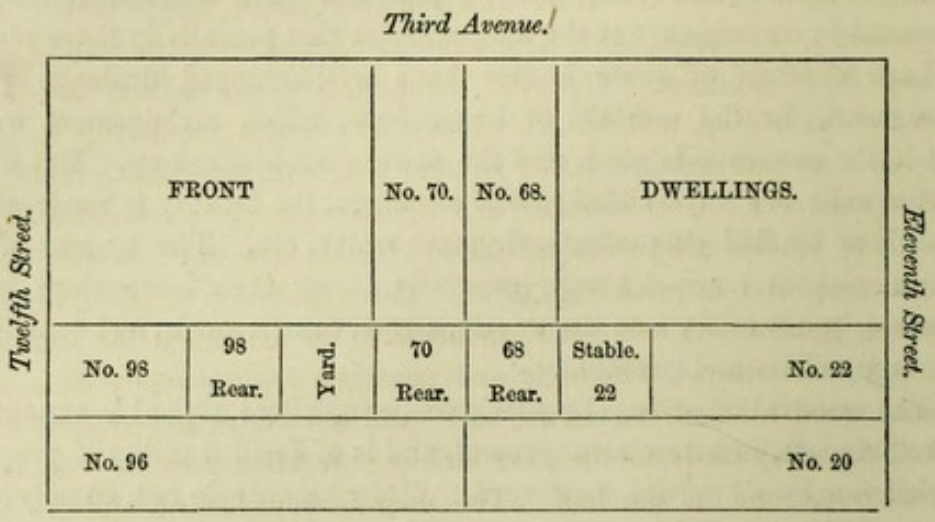
The removal of *garbage* by public cartmen, whose arrival is announced by bell-ringers, is a new arrangement, and is of decided utility if properly carried out by all parties concerned. Many tenants do not comply with the regulations, and throw garbage and house-slops anywhere.

The non-removal of the old-fashioned stationary garbage-boxes is a nuisance universally complained of. I have particularly noted four of these nuisances in Sixth Street near the Bowery; one in Second Avenue; two in First Avenue; and, strange to record, one before each of the larger Public Schools.

The privies are in most cases in the rear court-yard. In about two-thirds of the houses the privies are connected with the sewer. Overflowing privies are frequently found. Sometimes they are located in a dark place, which in all cases must be considered an evil. Such is the case in some houses in Rivington, Stanton, Ninth, and Eldridge Streets. All these places are filthy, and exceedingly offensive and dangerous to the whole neighborhood; in some places the foundation of the privies being rotten and broken, and fæcal matter runs into the cellar, as in No. — "Extra Place," where diseases and deaths have occurred. The contents of a privy in a court at No. — Fifth Street, have, from a similar cause, saturated the yard of premises on the Bowery, where several children died during this summer. Only a very few houses have water-closets like the modern-built dwellings.

Insufficient internal ventilation has been already mentioned. Most bedrooms in tenant-houses are dark. Some have a window toward a dark hall. In many of the houses ventilation of the dormitories is an impossibility, as such rooms are only dark and damp *cul-de-sacs*. The erection of too many rear buildings is objectionable, as it prevents the free current of air. As an example, the following rear buildings, Nos. 68

and 70 Third Avenue, No. 98 East Twelfth, and stables No. 22 East Eleventh Street, are in one line with the two front houses Nos. 22 East Eleventh and 98 East Twelfth.



Six buildings are here crowded upon the same ground area as would be occupied by only two houses in most other places; for instance, the two adjoining houses Nos. 96 East Twelfth and 20 East Eleventh Streets. This overcrowding of rear buildings prevents the ventilation entirely, and must be injurious to public health. The same condition will be found in a whole square bounded by Bowery, Second Avenue, Fifth, and Sixth Streets. A similar crowding of buildings exists in two consecutive squares between Bowery and Second Avenue and Houston and Second Streets, where scarcely any space for the yards is left. The larger number of tenant-houses have no gas, hence lamps and stoves are used.

Cellar and Basement Population.—Many basements and cellars are inhabited. In 15 squares 64 houses contain 343 persons residing in basements. In 17 squares 55 houses contain 246 persons living in cellars entirely under ground. The return of the population of basements and cellars of the whole district is not complete, but in the remaining squares not included in the above statement, such a population is only scattered. As a matter of course such cellars are unhealthy dwelling apartments. Stanton Place has some of these miserable cellar-apartments, in which diseases have been generated. These cellars are entirely subterranean, dark, and damp. Similar apartments can be found at No. — Thirteenth Street rear. These apartments are let respectively for $2.50 and $3.00 per month.

From the foregoing description of tenant-houses, it is apparent that the laboring classes are not living very comfortably and cheap. Many tenant-

houses need reform. But, it must be acknowledged, that some of these buildings are in a better condition, and a few may be called "model" tenant-houses, when compared with others. One of the latter sort is No. — Allen Street. Both the front and rear are brick, newly built. The front house is 4 stories, with a basement, each 10 feet to ceiling, and arranged for 8 families. The rear building is 3 stories and basement, each 8 feet to ceiling, and for 4 families; 32 persons are living in both houses on a ground area of 2,012 square feet, which makes to each person 63 square feet. Croton-water and house-drainage is provided on all floors. The privies are in the yard, and connected with the sewer; they are kept clean and in good condition. The ventilation is good, and all rooms are lighted. A sub-celler underneath the basement for coal and wood, is 10 feet deep. The halls and passages are unusually wide and pleasant; good oil-cloth is on the halls, and the stairs are covered with carpet. An alley leads to the rear building on Allen Street. Gas is in all apartments, and in the hall. The door is kept locked, and the bell promptly answered. The proprietor, a tailor, resides on the first floor, and is very particular with his tenants. Even this model tenant-house has its disadvantages, which consist in the lack of good external ventilation, which is prevented by the crowding of the buildings and the close proximity (in the rear) of Nos. 184 and 184½ Eldridge Street, which has been mentioned as a nuisance. Similarly good substantial tenant-houses can be found at No. 239 Ninth Street and No. 30 Sixth Street, etc.

In erecting new tenement buildings an entirely new system should be introduced. The demand for proper ventilation cannot be pressed too urgently. The arrangement of the dormitories is an important point. If dark rooms cannot be avoided, why not place there the kitchen and store-rooms. Some part of the lot ought to be devoted to a yard, and should not be obstructed with rear buildings. Good fire-escapes, wider halls, passages, and stairways, are needed as further improvements. A common wash-house ought to be attached to each tenant-house, which would improve materially the cleanliness of the people and their dwellings. Good sewerage, house drainage, Croton-water, and gas, and the proper arrangement and condition of the privies, are the next important questions for improvement.

Drinking Saloons, etc.—Very little can be said about these places. Complaints have been made of but two of the places. Except some of the low drinking shops, most of them are kept in a good sanitary condition. The following is their classification:

Dram-shops,	102
Private supper rooms,	3
Assignation houses,	3
Concert saloons, with (pretty?) waiter girls,	3
Groceries, with bars,	64
Lager bier saloons,	82
Brothels,	9
Hotels,	4
Total,	270

STORES, MARKETS, ETC.—There are in the district 499 stores and 53 markets. The stores include all varieties of business, and are generally situated on the avenues and in the Bowery. Warerooms attached to factories, and other varieties of business, which are enumerated under their respective heads, are not included in the above number. The markets are for the sale of meat, fish, and oysters, and are scattered in all parts of the district. Tompkins' Market is the only public market, and has 38 stands. This market is kept clean, and good order prevails. The building has been erected recently.

There are 53 factories of various kinds in this district.

SHOPS.—There are 154 shops. Some of these are attached to factories, but for most part are only small shops, in which tailors and shoemakers are largely represented. The book-bindery and printing establishment of the Bible-house employs 450 persons, of which more than one-half are females. The various work-rooms of this establishment are in elegant order, and the rooms are spacious and airy.

MISCELLANEOUS BUSINESS.—There are not specified the following kinds of business:

Brewers,	2
Distillery,	1
Coal yards,	5
Lumber yards,	2
Marble yards,	3

SLAUGHTER-HOUSES.—

Total Number of Slaughter-houses,	38
" " Fat-houses,	2
" " Hide and fat-houses,	4
" " Butchers' hide and fat association,	1

Total Number of	Provision and packing-houses, .	9
" "	Provision-houses, occasionally fat-boiling, of which complaints have been made, ...	2

Classification of Slaughter-houses, according to the animals killed there:

Where all kinds of animals are killed, . . .			8
"	beeves	" . .	14
"	beeves and calves	" . . .	4
"	calves only	" . .	1
"	sheep	" . . .	9
"	calves and sheep	" . .	1
"	swine	" . . .	1
	Total, ...		38

These 38 slaughter-houses are kept variously in regard to cleanliness and arrangements, and can be classified as follows:

(*a.*) The best establishments are kept in a superior style, and in such order and cleanliness that complaints never are made of them. This class I found clean at all times and seasons, and under all disadvantages. There are five that may be reckoned in this class:

(1.) 190 Forsyth Street.
(2.) The hoggery, 198–202 Forsyth, and 183 and 185 Eldridge Street.
(3.) 185 Ninth Street.
(4.) 73 Second Street.
(5.) 134 Fifth Street.

(*b.*) Slaughter-houses which are kept clean and in good order, according to the present laws. To this class belong 16.

(*c.*) Kept with less care, 9.

(*d.*) This fourth class of butcheries comprises those that are in a filthy and bad condition, cleansed *once* a week, 6.

(*e.*) The worst class—perpetual nuisances, 2.

A reform and better arrangements and regulation of slaughter-houses is urgently needed, and some steps ought to be taken immediately to secure the desired improvement. If we cannot at once obtain all the reforms that are desirable, we can certainly render these establishments less obnoxious to the public health and convenience by securing:—

1. The restriction of slaughter-houses to certain localities.

2. That all slaughter-houses shall be connected with the sewers.

3. That the driving of herds of cattle shall be restricted to *certain* streets and hours.

4. That blood and all fluids shall flow *directly* into the sewer. If the blood is preserved for other purposes, it should be collected immediately, and kept in air-tight vessels.

5. The utmost cleanliness, and the most careful removal of offal, etc., within a certain time after killing.

6. The offal and all refuse to be carried away, should be thrown into air-tight vessels immediately after being separated from the animal.

7. That persons employed to remove such offal and other solids, shall carry them in air-tight vessels, and leave empty vessels of the same kind in their places.

8. The killing and slaughtering process shall be carried on in the rear of the lot, away from the street, in order that curious people and children cannot witness it.

9. The stable manure to be kept in covered well-built sinks, with an outlet of the fluid parts into the sewer, and removed within certain periods.

10. Fat-boiling to be strictly prohibited, and fat and hides kept as stated under No. 6.

11. Strict vigilance for the observation of the above rules to be maintained, and the prompt infliction of fines in every case of neglect shall be enforced.

The utility of a faithful observance of these rules must be obvious, as such observance would prevent any nuisance, disease, or even unpleasant smell and sight. Such rules for slaughter-houses may even be extended to further details, by—

Inspection of cattle and meat, to exclude unhealthy meats from the markets.

A regulation of the size of slaughter-houses, in order to secure the proper kind of buildings for the business carried on.

During warm weather slaughtering should be allowed only at nights, and offal should be carried off before six o'clock A.M.

These rules and suggestions would not exclude other improvements, nor the introduction of abattoirs. That slaughter-houses may and can be kept clean, even under the present system, with all the disadvantages, may be proved by an examination of several of these establishments.

Two cattle markets, for the sale of sheep principally, are kept in

4th STORY
3d STORY
2nd STORY
1st STORY
BASEMENT STABLES
BRIDGE
ENTRANCES
STAIRWAY TO 2ND STORY

Sixth Street, between Bowery and Second Avenue, under the name of "Central Bull's Head," close to the fashionable quarters of the 17th and 15th Wards. 14,000 sheep can be kept here, besides some hundred head of cattle.*

SCHOOLS, CHURCHES, AND MEDICAL CHARITIES.—The churches within this district belong to the following denominations:

Synagogues,	2
Episcopal,	2
Methodist,	1
Baptist,	2
Presbyterian,	3
Roman Catholic,	1
German Evangelic,	2
" Lutheran,	1
Total,	14

There are four public schools, and three schools attached to churches.

There are six Dispensaries and other medical charities, viz.: A Homœopathic Dispensary in Eleventh Street; the German Dispensary in No. 8 Third Street; the Dispensary of the Physicians of the German Society; the Eye Infirmary of New York; the Women's and Children's Infirmary; and the Society for the relief of the Ruptured and Crippled. Four of these institutions have small hospitals attached.

The other institutions within this district which cannot be specified under the preceding heads, are:

The Historical Society building.
1 Police station house.
1 District court.
4 Armories for Militia regiments.
3 Banks.
6 Fire Companies.
1 Gymnasium.
2 Private Observatories.
The Cooper Union.
The Bible-house.

* On page 157 the artist has represented one of the scenes that is daily witnessed in this locality.

CEMETERIES, CHURCH-YARDS, AND VACANT GROUNDS.—The church-yards, nine in number, are situated as follows:

1. Houston Street, between Bowery and Christie Streets.
2. " " Christie and Forsyth Streets.
3. " " Forsyth and Eldridge Streets.
4. Second Avenue, " Second and Third Streets.
5. First Street, " First and Second Avenues.
6. Second Street, " " "
7. Eleventh Street, " " "
8. First Avenue, " Eleventh and Twelfth Streets.
9. Second Avenue, around St. Mark's Church.

Most of these graveyards are in good order; two, Nos. 4 and 6, are even ornamental. One, No. 5, is in the centre of the square; the only access to it being through the playground of the Public School.

From one, No. 7, the human remains have been removed during the last summer. Only one, No. 2, needs a thorough cleaning, as all kinds of articles are found scattered in it, as dead cats and dogs, broken bottles, old shoes, rags, etc.

There are several vacant lots that are in a most horrible condition. They are the reservoir of all kinds of rubbish. The whole appearance of these places is disgusting and unhealthy. During inspection these lots were partly covered with stagnant water, stones, bricks, pieces of old tin and mats, human excrements in large quantities, stable manure, old boots and shoes, pieces of old hoop-skirts, dead cats, decomposing potatoes, ashes, and chickens.

NUISANCES.—These have been already mentioned at length under their respective heads. The following is a list of the principal ones:

1. The insufficient bad sewerage, with all its consequences.
2. The houses Nos. — and — Eldridge Street.
3. The dirty state of some parts of the streets and gutters.
4. The bad pavement in some localities.
5. The cellars in "Extra Place" being foul with fæcal matter.
7. The coal yard, No. — Bowery, occupying the first floor for a whole block, from which emanates foul air into "Extra Place." *
7. An insalubrious locality situated between the walls of the large provision store, No. — First Street, and the rear buildings of Second Street. This is a narrow place, into which the tenants of the rear buildings have thrown manure, slops, garbage, etc.; these have accumulated

* See the diagram of this locality next page.



The above Diagram presents a square in which some of the faults of overcrowding are strikingly depicted.* In the very midst of this agglomeration of domiciles and great business establishments a slaughter-house is located. This, with the stables at the terminus of Extra Place, must be regarded in the light of a nuisance, and probably they together help account for the diseases that are most prevalent in that *cul-de-sac*.

The crowding of the buildings—almost entirely without yards, and consisting of an exterior line of dwellings, surrounding an immense packing-house, a slaughter-pen, various shops, and a foundry—is such as to preclude proper external ventilation on the one hand, while those interior structures and the business pursued in them are sources of offence against sanitary laws. The Inspector presents the ground-plan sketch of this square as an illustration of an evil that is rapidly increasing in various sections of his district.

The little square here represented contains 51 front houses, mostly dwellings; rear buildings, including those on "Extra Place," 15; there are 5 alleys, and one prolonged *cul-de-sac*, which being narrow and enclosed on all sides and directly behind rear tenant-houses, and upon the south side faced by the high walls of a provision-packing house, has become a gross nuisance—a cloacal depot, into which are promiscuously thrown slops, garbage, and exuviæ, until it has become a fountain of typhoid infection.

The following extracts from sanitary inspection reports made concerning diseases in this locality, will serve to illustrate the nature of the perils to which these domiciles are exposed:

First Case.—Mrs. ——, No. — "Extra Place," mother of five children, had a long period of incubation of the typhoid infection; died on the thirteenth day after the physician was called. *Cause*—foul emanations from local nuisances in the vicinity of the dwelling; three families in this house are exposed to the same sources of infection. The allowance of ground area to each person in this house is 44 square feet; the average or *pro rata* allowance of air-space to each person in this domicile is 402 cubic feet.

Second Case.—Mrs. ——, No. — "Extra Place," is in the rear, opposite the house formerly reported in same locality; patient was the mother of four children; had been constantly exposed to the foul emanations from unclean and leaking privies of the rear tenements, as well as to the exhalations from a slaughter-pen and the stables near by. She died on the sixteenth day after taking her bed.

* For explanation of the *symbols* used upon this Diagram, see Chart on p. 31.—Editor.

there. The only access to this locality is by means of the iron foundry No. — Second Avenue.

8. The insalubrious locality of court No. — Fifth Street, which is in a very filthy condition. One privy has given way and saturated the soil of yard No. — Bowery, which has injured the health of the inhabitants of the latter place.

9. The yard and privy of No. — Sixth Street. The privies here are terribly offensive. Garbage, filth of all varieties, rubbish, and fæcal matter is in piles in this yard, and in such close proximity to No. — Fifth Street that the basement inhabitants of the latter house have a dunghill before their window, injurious to health.

10. The driving of cattle through the streets, and at all hours.

11. An insalubrious locality in Eleventh Street near Third Avenue, occasioned by the fluids of stable manure.

12. Two packing-houses, where fat-boiling is carried on occasionally.

13. The cellars of No. — First Avenue, rear used as dwellings. One of these apartments is in a particularly bad condition, in consequence of an adjoining privy.

14. First Avenue, between Houston and First Street, is always filthy.

15. The privies and cellars of — E. 11th Street, rear. The privies are beneath the floored alley-way leading to the building. Large holes in this floor allow ocular inspection from above, and admit rain and dirt. These nuisances are almost always overflowing, and the passage leading to them is full of fæcal matter. It would seem impossible for human beings to create or endure such vileness. The cellar is used by children and others as a privy; the foul air there seems never to change.

16. An insalubrious locality in Forsyth Street, near Rivington, where the gutter has no drainage. A calves' head boiling establishment, in a shanty near the corner, and a slaughter-house, aid in filling up this list of nuisances.

17. The insalubrious quarters, No. — Third Avenue.

18. The construction of the private sewer for the houses No. — to — Third Avenue.

19. The sink at No. — Rivington Street.

20. The gutter before No. — Stanton Street.

21. The insalubrious quarters at No. — Stanton Street.

22. The condition of the sidewalk in Stanton Street, between Eldridge and Allen Streets.

23. The condition of Stanton Place.

24. The ugly stationary garbage-boxes in different parts of the district.

25. A cesspool at No. — Stanton Street.

26. The location of privies in dark cellars.

27. The condition of privies in general, and their foundation given way, as for instance in No. — E. Eleventh Street.

28. The insalubrious locality, Sixth Street, between Bowery and Second Avenue.

39. The "fever-nest," Court No. — E. Eleventh Street, with its surroundings.

30. Two slaughter-houses, kept particularly unclean.

31. The want or insufficiency of fire-escapes in crowded and high tenant-houses.

DISEASES.—During the past spring and summer the following diseases have been observed to be very prevalent:

1. In Thirteenth Street, between Third and Fourth Avenue, cholera infantum and measles.
2. Extra Place, cholera infantum, typhus, and diphtheria.
3. First Street, cholera infantum.
4. Fifth Street, small-pox.
5. Sixth Street, measles and diphtheria.
6. Ninth Street, typhus and measles.
7. Eleventh Street, cholera infantum.
8. Thirteenth Street, typhoid fever.
9. First Avenue, typhus, etc.
10. First Avenue, small-pox.
11. Eleventh Street, typhus.
12. Twelfth Street, typhoid.
13. Eleventh Street, typhus.
14. " " "
15. " " "
16. Thirteenth Street, "
17. " " measles.
18. Fifth Street, typhus.
19. First Street, small-pox.
20. Fourth Street, typhoid fever.
21. Stanton Place, typhus "

The causes of these diseases have already been referred to, and have been detailed in the special reports. Generally a number of similar cases could be traced from one patient to another; hence contagion was clearly proven. The insalubrious quarters or neighborhood of such places often generate and perpetuate these diseases.

In one instance the origin of typhus fever was traced to an immigrant

who was suffering with this malady. A friend of that patient visited her, and soon after was attacked by the same disease. This friend, a girl living in Eleventh Street, conveyed the malady by contagion to several other persons. One of these parties was Mrs. ——, East Twelfth Street. Eight individuals belonging to her family were attacked with fever, contracted while nursing the father. These eight persons were residing in different parts of the cities of New York and Brooklyn.

The spread of pestilential diseases by *fomites* is a subject worthy of consideration. Several instances have come under my observation where small-pox and fever have apparently been spread in this way. Other inspectors have also reported similar cases.

The most notable fever-nest of this district is the Court No. — East Eleventh Street. Nearly all the causes for generating and perpetuating this disease exist there. It is an insalubrious and crowded locality, surrounded with junk-shops, second-hand clothing stores, and a great number of the lowest drinking places; a transient population fill the tenements who introduce maladies by contagion and fomites. Some of the apartments in this court are used only as lodgings. People without a home, professional beggars and vagabonds, lodge here, and sleep in their clothes on the floors in an already overpopulated apartment.

Insalubrious localities and quarters often exist without diseases. The only explanation of such occurrence is, that other influences counterbalance the causes of disease. Such influences are: 1. The natural healthiness of the district, as good drainage, soil, elevation, and a pure air. 2. The habit of the population as to cleanliness in their persons and domiciles. 3. The peculiar constitution of the individuals as to insusceptibility.

RECAPITULATION OF STATISTICS.*

Total number of buildings,	2,354
Vacant lots,	38
Grave-yards,	9
Courts,	46
Alleys,	160
Rear buildings,	272
Tenant-houses,	734
Cellar and basement population,	589

* It has been found necessary greatly to condense the elaborate statistics submitted by the Sanitary Inspector of this district.—EDITOR.

Population.

No. of families in private dwellings 2,107.
" " in tenant-houses 5,872. Total, 7,979 families.
Total population, 39,890.
The average of ground area to each person living in tenant-houses is 40 square feet.

Stores and Business.

Stores,	499
Markets of all grades,	53
Lager bier saloons,	82
Groceries with bar,	64
Dram-shops,	102

Classification of Buildings.

Private dwelling-houses,	1,204
Tenant-houses,	734
Stores, factories, shops, etc.	123
Slaughter-houses,	38
Packing-houses, fat and hide houses, etc.,	17
Churches,	14
Schools,	7
Hotels, saloons, armories, etc.,	48
Stables,	116
Miscellaneous, not specified here,	53
Total,	2,354

Formerly

THE ROYAL SOCIETY OF HEALTH LIBRARY

THE ROYAL SANITARY INSTITUTE LIBRARY

REPORT

OF THE

FOURTEENTH SANITARY INSPECTION DISTRICT.

EDWARD W. DERBY, M.D.,
Sanitary Inspector.

BOUNDARIES.—*North by East Fourteenth Street, east by Avenue B, south by Rivington Street, and west by First Avenue—not including any portion of that avenue. This district comprises the eastern half of the Seventeenth Ward.*

TOPOGRAPHY.—The grade of the district may be said to be low, and the surface level, as the upper two-thirds have been reclaimed from the river shore. The soil is for the most part sandy, except that of the made ground, which is necessarily made of refuse material. A general tendency to humidity prevails, which, as a matter of course, affects more or less the health of those who occupy the ill-ventilated and insufficiently-warmed basements.

STREETS.—The streets run nearly north and south and east and west, are of the usual width, paved with cobble stone, except Tenth Street, which has Belgian pavement, and are seldom clean except for a few hours after being swept; a process to which they are not often subjected. The gutters, as a general rule, in front of the tenant-houses, overflow with filth, and are made the receptacles of the decaying vegetable and animal refuse, and the ashes of the different families, into which they are habitually thrown, and which, under the influence of the rays of the summer's sun, exhale miasmata that must and do materially affect the health of the surrounding population.

SEWERS.—Sewers exist I believe in every street, are for the most part connected with the houses, and generally suffice for their drainage; but in not a few instances these become choked, and contribute their share of fœtid exhalations to the general insalubrity.

SQUARES.—The district is composed of 37 squares, covered with tenant-houses, generally of a poor character, in good or bad repair according as they are new or old, about 1,700 in number, and occupied by about 18,000 families. The character of the population of these squares being almost identical, and they being subjected alike to the negligence of the municipal authorities, their sanitary conditions do not materially differ. The deleterious influences of this neglect of cleanliness on the part of the authorities and the inhabitants are apparent. It might be expected that the atmosphere, surcharged with the noxious gases resulting from animal and vegetable decomposition, together with the production of what our learned Professor Joseph M. Smith has termed "Idio-miasma," from the cutaneous exhalations of filthy skins in crowded and ill-ventilated apartments, might be expected to be productive of an extreme degree of typhoid or malignant febrile disease. Such cases undoubtedly do occur; and if with a degree of frequency less than might have been anticipated, it is not either to any attention to sanitary regulations on the part of the inhabitants, or of the authorities, that this immunity is due.

INHABITANTS.—The inhabitants of this sanitary district are, for the most part, Irish or German, the former predominating, and are of the laboring class, poor, imperfectly nourished upon salted and vegetable food—chiefly cabbage—uncleanly in their persons and habits, and grossly addicted to intemperance, that fertile source of vice, misery, and crime.

BUILDINGS.—There are but few private dwellings, churches, or manufactories, and what private dwellings there are were generally built some years since, and are for the most part wanting in what are called the modern conveniences. The houses are the usual three to six-story brick tenements, generally out of repair. The water is most frequently located in the halls or yards, affording no means of bathing. The halls, except the lowest and top ones, are always dark; and the rooms are lighted by the various oils now in use, which contribute their carbon for the still further deterioration of the already impure and exhausted atmosphere. There are also many families of mechanics of more temperate habits, whose comforts are consequently greater. The nationality of most of these is European. As might be expected, the sickness and mortality among the former of these, owing to the paucity and bad quality of their food, and the numerous existing sources of constant vitiation, is much greater.

The privies are located in the yards, in close proximity to the houses, and are in the disgusting condition which might be expected, being promiscuously used by persons unaccustomed to habits of cleanliness and regardless of decency. These, too, add their reeking flavors to the other perfumes of which these districts abound, and to the malariousness of the

atmosphere. Much has been said of late, in reference to sanitary matters, upon the subject of the overcrowding of tenant-houses. I can add my testimony to the truth of such statements, and the hygienic influence of the evil. Rooms that are overcrowded are for the most part badly ventilated, and either too hot or too cold. If fuel be deficient, the windows and crevices are stopped, and the noxious emanations of dirty people are confined by equally dirty fomites. If, on the contrary, the room is small, it is overheated, and the cutaneous secretions are thereby increased; and they, not being removed by subsequent ablutions, become prolific sources of cutaneous and febrile diseases. The fecundity of the poor has long been a matter of remark. The number of diseases which menace and destroy infantile existence seem almost a providential interference to prevent an excess of population over and above that which the means of the parents could possibly support. Nor, when we reflect upon the condition in which these unfortunate children are found to exist, and the many circumstances, moral and hygienic, by which they are surrounded, do we wonder less at the amount of sickness and mortality among them than that it is not greater; less that they die than they survive.

Dram-Shops.—The low groggeries and groceries, in all of which liquors are sold, are constantly thronged, I am sorry to say, with members of both sexes, youth and old age vieing with each other as to their capabilities of drinking, enriching the proprietors of these places, spending their last penny in gratifying their morbidly-debased appetite rather than purchasing the necessaries of life for their families, and then issuing forth or being thrust out upon the streets in various stages of intoxication, half-crazed with the vile and poisoned liquor they have swallowed, fit subjects for the committing of the many crimes which are daily chronicled in our papers. Such are the places which stare you in the face at every step, a disgrace to the city, and a prolific source of corruption to the morals of the surrounding inhabitants.

Stores.—There are many stores of all kinds occupying the first floors of the tenant-houses, having, no doubt, when occupied as butcher-shops, sausage-making establishments, and receptacles for old rags, a deleterious influence upon the inhabitants of the floors immediately over them.

Factories.—There is but one to which my attention has been especially directed in a sanitary point of view, and that is a varnish factory on the northeast corner of Rivington and Norfolk Streets. The odor arising from the materials used is very offensive to the smell; the effect of which may be injurious to the health of those in the neighborhood, by interrupting healthy nutrition, and add its quota to the many surrounding malarious influences.

Slaughter-Houses.—The slaughter-houses are not so numeroues in my district as in some of the others, ten or twelve being all that I could find; but though few in number they are not the less an evil and a nuisance, as they are always to be found in a filthy condition, exhaling the most offensive odors, reeking with decomposing offal, and offensive alike to morality and senses. Although they are not in themselves, so far as I can ascertain, productive of disease, yet they do, no doubt, add their full share to the many provocative influences which are so indigenous to a tenement neighborhood. The moral influence, however, which they exert upon the younger population is greatly to be deplored, as they are generally open to the view of the many passers-by, and the doors are constantly thronged with wondering, admiring children, who are eager listeners to the not very elegant language which pertains to the slaughter-house, and who thus become habituated to scenes of blood and violence, and to language which is stamped upon their memory never to be forgotten.

Tompkins' Square, which from its size forms very useful *lungs* in the ventilation of the district, and the circulation of pure air which it affords, contributes largely, no doubt, in aid of its healthfulness. It is very much to be desired in the planning of all large cities, that wide open parks should be laid out; and this feature of our city as contrasted with the closely-built and ill-ventilated old cities of Europe, contributes in a large degree to the greater immunity from miasmatic fevers which it enjoys. A Roman Catholic burial ground is situated within my district, but I am not aware that interments are now made in it, nor do I know that it exerts any deleterious influence on the sanitary condition of the district.

Diseases.—I may mention that the diseases which generally constitute the most fatal scourges of children, are cholera infantum in summer, and in winter the contagious exanthemata, and the effects of cold upon the respiratory apparatus. Not a few fall victims also to diseases arising from scrofula in the brain and its meninges, derived from an inherited cachexia, and from sympathetic ecclampsia of the brain and spinal marrow depending on gastric irritation arising from improper nourishment.

Signs of congenital contamination are not unfrequently met with in these unfortunate children, who are doomed to expiate in their own persons the sins of their parents for many generations. Among the other diseases to which my attention in the daily pursuit of my arduous Dispensary duties is most frequently called, are typhus and typhoid fevers; diseases occurring for the most part in adult people, spreading by infection, and communicating by contagion, and inspiring, like small-pox, the most intense dread and fear, which materially interferes with the welfare

of the sufferers by preventing them from being properly nursed—which endangers the life of the disinterested physician when called to administer to his necessities, and to whose malign influence many a promising votary of our science has fallen a premature victim—may be said to be the especial scourge of the poor.

According to my views and observation the spread of this disease has been materially increased during the war by the frequent influx of retired or discharged soldiers to their families and friends, fresh from the field or the hospital, and bearing in their persons or their clothing the seeds of the disease. I need not say that the total absence of any thing like proper disinfection of their apartments tends to continue the disease for an indefinite period after the removal of the original cause, to the detriment of the successive members of the same family or those coming after them.

There is yet to be mentioned another cause, which is, and long had been, a fruitful one in the propagation of disease: I mean the immigrants. In what way or in what manner the wafting of the many diseases which always are their companions, can be better guarded against than at present, I am not prepared to say; the existing laws, if properly executed, are I think as effectual as possible; indeed I know not if the usefulness of the immigrant does not counterbalance the evils that accompany him.

Diarrhœa, from various causes, chiefly amongst children and drunkards, running into dysentery which occasionally terminates in collapse, is frequently met with. In this connection I would observe that I have been visiting Physician to the Eastern Dispensary for the last seven years, and during that period have visited at least twelve thousand patients; and amid all the deleterious influences to which I have been so freely and constantly subjected, I have graciously been permitted thus far to escape unharmed. My sole preventives from contagion have been fearlessness, strictly temperate habits, and walking instead of riding during the performance of my professional duties, whereby the miasmata to which I have been exposed have escaped into the surrounding and open atmosphere. While on the subject of diseases, I will enumerate the number of cases of typhus and typhoid fevers, diarrhœa, rubeola, scarlatina, and variola, that I have visited in my dispensary district during the past eleven months:

Typhus and typhoid fevers,	110	patients.
Diarrhœa,	176	"
Small-pox,	16	"
Measles,	47	"
Scarlatina,	20	"

As to the rate of mortality, I would state that out of about one hun-

dred and fifty patients a month, the average number of deaths is about five; but I do not wish it to be understood that is the rate of mortality; I wish it were; it is not, and for these reasons: First. Dispensary physicians, from their multitudinous duties, from the fact that a tenement-population is a migratory one, and from other causes which the physicians cannot control, are unable to follow their patients as closely as they would like. Second. Many severe cases that are not likely to recover, are sent to one or the other of the many hospitals with which our city is so bounteously provided. Third. Often when the sickness is a grave one and tends not to recovery, the friends or the patient become dissatisfied, and call in another physician, thereby relieving the dispensary physician from further attendance. Fourth. It happens in many instances, that when the relatives or friends become fully aware there is no possibility of the patient's recovery, they needlessly fear, through ignorance or stupidity, that they may have some difficulty in obtaining a certificate of death from the dispensary physician, or perhaps from a feeling of pride they dislike to have it attached to the certificate that their friend or relative was treated gratuitously from a dispensary, and therefore to avoid incurring that great bugbear of all ignorant persons, a coroner's inquest, they call in the nearest physician, from whom the requisite certificate is obtained.

Improvements.—I regret to be obliged to add, that by no action of present health authorities under my observation, have any of the objectionable features to which I have alluded, been removed or improved.

Remedial Measures.—In reference to remedial measures, I would remark that the remedy suggests itself; but the application is confessedly difficult. To obtain the willing consent of persons so ignorant, so degraded, so careless of their own best interests, present or future, in any scheme of hygienic amelioration which should involve a change of habit, abandonment of vice, sacrifice of comfort, or the increasing of expense, may seem to present some difficult problems, but such problems can and must be solved; and it is clear that our efforts should be persistently and strenuously made in this direction; and hence the public value of the work in which we all are so earnestly and laboriously engaged.

Gradually, the words spoken "in season and out of season" by our medical missionaries may effect the sanitary conversion of some of these hardened sinners; and it occurs to me that the distribution of tracts, upon matters connected with the public health, among these dwellers in tenant-houses, would be useful to the health and salvation of the body, I would, therefore, beg leave to call the attention of my colleagues to this means, in addition to the other measures which are now being employed toward the attainment of that greatest of public ends, the security and improvement of the public health.

REPORT

OF THE

FIFTEENTH SANITARY INSPECTION DISTRICT.

JAMES ROSS, M.D.,
Sanitary Inspector.

BOUNDARIES.—*This district comprises the whole of the Eleventh Ward. It is bounded on the north by East Fourteenth Street, east by East River, south by Rivington Street, and west by Clinton Street and Avenue B.*

This ward contains 3,190 building-lots of ordinary dimensions, and in 1860 embraced a population of 59,571 souls.

TOPOGRAPHY.—Two-thirds of this district were formerly covered by the waters of the East River and by low salt marshes. Twenty-one of the squares now cover the section that has been reclaimed by filling and drainage. The sand hills that once skirted the marshy region have been graded down and used for filling in the low grounds.

DRAINAGE.—The natural drainage, which was rather incomplete, was by three creeks. The largest had its origin west of the district; then running northeast it crossed Stanton Street near Clinton, Houston near Sheriff, and Second Street near Houston, entering the river at Third Street. Another commenced near Avenue A and Fourth Street, ran with a zigzag direction between Sixth and Eighth Streets, and emptied its sluggish waters into the river near Ninth Street. The third stream ran northeastwardly through the blocks bounded by Eleventh and Fourteenth Streets, Avenues B and C, reaching the river at Fourteenth Street.* In this neighborhood was the old Stuyvesant Skating Pond, where New Yorkers in former years held their skating carnivals.

Sanitary Influence of the Topographical Formation.—In some parts of the reclaimed ground in this district it has been necessary to build the

* See the Sanitary and Topographical Map at the beginning of this volume.—EDITOR.

houses upon piles. In numerous cases the cellars are shallow, which is probably a necessity owing to great moisture of the soil. Some have standing water in them constantly, and many of the inhabitants complain of the extreme dampness of their basements. Where such conditions exist it may reasonably be expected that great insalubrity will prevail. This fact finds fearful illustrations in the inhabited basements and cellars east of the line of Ridge Street and Avenue C.

Streets.—The streets of the Fifteenth District north of Houston Street, consist of parallel avenues and thirteen streets that run at right angles with them. They are all of sufficient width to allow of good external ventilation to the several blocks of buildings.

The avenues are from 55 to 70 feet in width, the streets from 50 to 105, the latter being the width of Fourteenth Street.

Avenue B, Columbia, Houston, and Tenth Streets are paved with trap-block Belgian pavement, and are of a uniform surface and in a fair condition. All the other streets of this district have cobble-stone pavement, are often uneven, and in very many places need repair.

As a rule the streets are extremely dirty and offensive, and the gutters obstructed with filth. Occasionally there exists an exception, which seldom extends for more than a block. These *oases* are observed in those localities where the residents have put in practice the old system which required every housekeeper or occupant to keep the street clean in front of his premises.

The filth of the streets is composed of house-slops, refuse vegetables, decayed fruit, store and shop sweepings, ashes, dead animals, and even human excrements. These putrefying organic substances are ground together by the constantly-passing vehicles. When dried by the summer's heat they are driven by the wind in every direction in the form of dust. When remaining moist or liquid in the form of "slush," they emit deleterious and very offensive exhalations.

Possibly a person may become acclimated to such a locality, or even relish after a time that which at first was very disgusting. If it is a fact that a person passing through a malarious district receives the germs of disease that may not mature in many months, while we can only partially estimate the full effect of the miasmata from filthy streets, we cannot doubt their injurious influence upon the public health. But there is a sure penalty for every violation of physiological laws. And we have abundant evidence that the nuisances which exist throughout this inspection district, both produce and localize several of the more fatal diseases that are concerned in giving to our city its present high death-rate. The reeking stench of the gutters, the street filth, and domestic garbage of this quarter

of the city, constantly imperil the health of its inhabitants. It is a well-recognized cause of diarrhœal diseases and fevers.

Sewerage.—All of the avenues are sewered, and with only a few exceptions the streets also. The street sewers are egg-shaped in construction, and have their outlets below tide-water.

The tides force back the contents of the sewers throughout the lower level of the district, and thereby cause a noxious reflux of sewer gases. The importance of sewer and drain-traps is here illustrated. Many of the houses are not connected with the sewers, and this circumstance adds to the filthiness and insalubrity of the district. In scarcely any other section of the city can the importance of thorough sewerage and skilful house-drainage and sewer-trapping be more forcibly illustrated. Of course it is not necessary that the sanitary inspector should present to a council of medical gentlemen any argument in support of the assertion that we must attribute to the imperfections of the sewerage much of the typhoid fever as well as other prevalent maladies of the low districts of the city. The old farmers who owned these low grounds in early times had them drained by deep ditches, simply with reference to pecuniary advantages to themselves; how much greater the importance and economic value of thorough drainage of the same region, now that a population of sixty thousand people have made their homes upon the crowded squares that cover these old marshes.

Squares.—In the Fourteenth District there are 71 squares. But few of them are in a perfect sanitary condition. The causes that render them insalubrious are numerous. Beside the overcrowding of space which we illustrate below, there is an entire absence of, or deficient drainage; there are dirty streets, neglected privies, filthy alleys and yards. Many of the privies are not connected with the sewers.

One square between Avenues B and C contains a little less than 142,636 square feet; the number of persons living on this square, ascertained by inquiry at each house, is 1,788, which gives less than 75 feet of ground area to each individual. There are also kept on this square nine horses, and a great number of dogs and domestic fowls. This same square has 88 buildings; and of these, 85 are dwellings, containing 472 families; 22 are rearhouses, having 79 families; and 16 families live in basements. Some of the basements are cellars.

Buildings.—The number of dwellings in the Eleventh Ward is 2,769; of which number 2,152 are tenant-houses; 432 are rear houses; stores, 825; places for the sale of liquor, 286; churches, 6; schools, 8; public market, 1; slaughter-houses, 19; stables, 159.

The number of private houses is reported as being 617. They vary

in height from two stories and basement to four stories. Some, but not all, have the "modern improvements," such as gas, and hot and cold water through the house. The newer class of tenant-houses are generally five or six stories in height, and are made to occupy as much ground as greedy landlords can manage to cover with their brick and mortar.

TENANT-HOUSES.—The total number of tenant-houses in this district is 2,152. About one-tenth of them are of wood, the remainder of brick. Nearly one-fifth of the total number are rear houses. Their age is from those built within a few months to the dilapidated old barracks which the late Dr. James Stewart aptly denominated "Dens of death." The custom prevails here of sub-letting a part of a room to "boarders," which increases the ordinary crowding. A few of the more modern tenant-houses in this district are of a commendable pattern. As an illustration we give those built by John Wendell in Fifth Street between Avenues B and C. They are the best arranged domiciles in respect to ventilation, lighting, and cleanliness, to be seen in the Eleventh Ward.

This district probably has a greater number of artisans, workers in wood and metals, than any other district in the city, and nearly the whole water-front as well as several entire blocks are occupied by the extensive manufactories in which they are employed.

The shipyards, iron, lead, and copper works here, also give employment to many thousand hands to whom a residence near is a great necessity. Hence the excessive crowding in this locality.

How great a benefit would the construction of model tenant-houses in this vicinity confer upon its population! The abodes where moral vileness, squalor, filth, disease, and death now hold the sway, would be converted into pleasant rooms, giving health and happiness to thousands. If some of our capitalists would take the subject in hand, and cause the erection of model tenant-houses in this locality, such structures would stand as a monument to their names and an honor to our city. If our Central Park, which has cost millions without any direct pecuniary returns, finds so much favor with a generous public, the construction of model tenant-houses, which would confer such benefits upon the poor, should also excite a deep interest.

That such dwellings would be a paying investment, may be inferred from the fact that the present crowded habitations of a tenant-neighborhood afford an interest of more than fifteen per cent.

STABLES.—Though we are not prepared to show what particular diseases or what mortality is to be directly traced to the neglected and misplaced stables in this district, the following facts respecting them, contained in the records of our inspection, will illustrate the importance of bringing them under some kind of sanitary regulation.

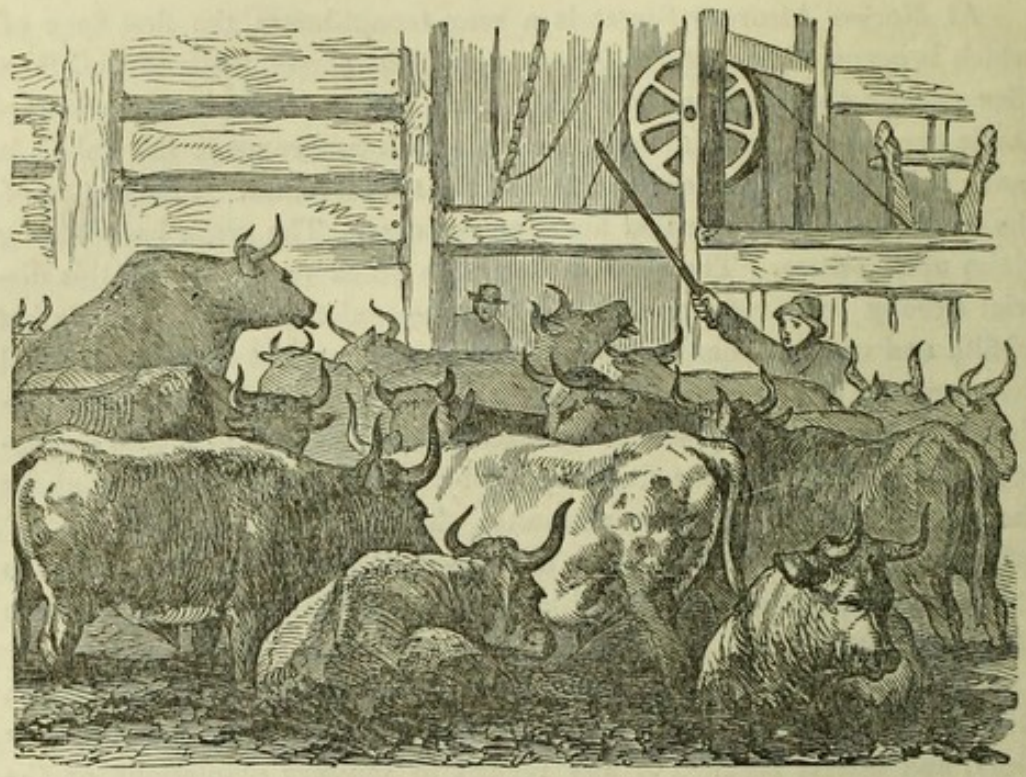
At No. — Attorney Street is a rear tenant-house, the first floor of which is occupied as a stable for seven or eight horses, while several families occupy the floors above. Again at No. — Avenue B, a horse-stable occupies the rear area of the lot, and the entrance to the stables is made only through the door and hall of the tenant-house. I found two of the scrofulous children in that house on crutches. The grave has a strong claim upon others. The relative localities which the stables in this district occupy with reference to the tenant-population, the accumulation of filth and manure about them, and the general neglect of adequate local drainage and means of cleansing such premises, demand that some practicable and acceptable plans for the improvement of stables should be presented, as well for the benefit of the hard-working owners of horses as for the general welfare of the community. The prevalence and fatality of pulmonary diseases among horses in overcrowded and neglected stables is only equalled by the fatality of like maladies in the women and children of tenant-houses.

Slaughter-Pens.—We found 19 slaughter-houses in the Fifteenth District. In most instances the condition of these places is excessively filthy, and utterly reckless of any regard to sanitary regulations or the laws of decency. The worst class of these slaughter-pens is found in rear buildings amidst the most densely-packed tenant-houses. As a written description can convey no adequate idea of the shameless and brutal scenes that are daily witnessed in and about these butcheries, we beg leave to refer to the faithful illustrations of them which appeared in Frank Leslie's Illustrated Newspaper several months ago.*

Insalubrious Quarters.—This inspection district embraces a great number of fever-nests and insalubrious quarters. The following description of three of these places will suffice for the whole series. We copy from our records of inspection:

1. "Second Square—*Stanton to Rivington Street.*—Ground filled in, and so level as to render the natural drainage imperfect. Sewers on Lewis, Stanton, and Rivington Streets, but none of the houses are connected with them. There are in all 52 houses on the square, of which 40 are front, 12 rear, and 41 are tenant-houses. Nearly all of those designated tenant-houses are small two or three story houses, originally intended for one, but now occupied by from five to eight families. Only six of them were originally built for tenant-house. They are all overcrowded, in a bad state of repair, and kept in a most careless and filthy condition. Their apartments are small and ill-ventilated, halls and

* See one of the scenes here referred to on the next page.



A SLAUGHTER-PEN IN THE ELEVENTH WARD.
(In a Rear Court of Tenant-houses.)



VEAL MARKET IN THE ELEVENTH WARD.

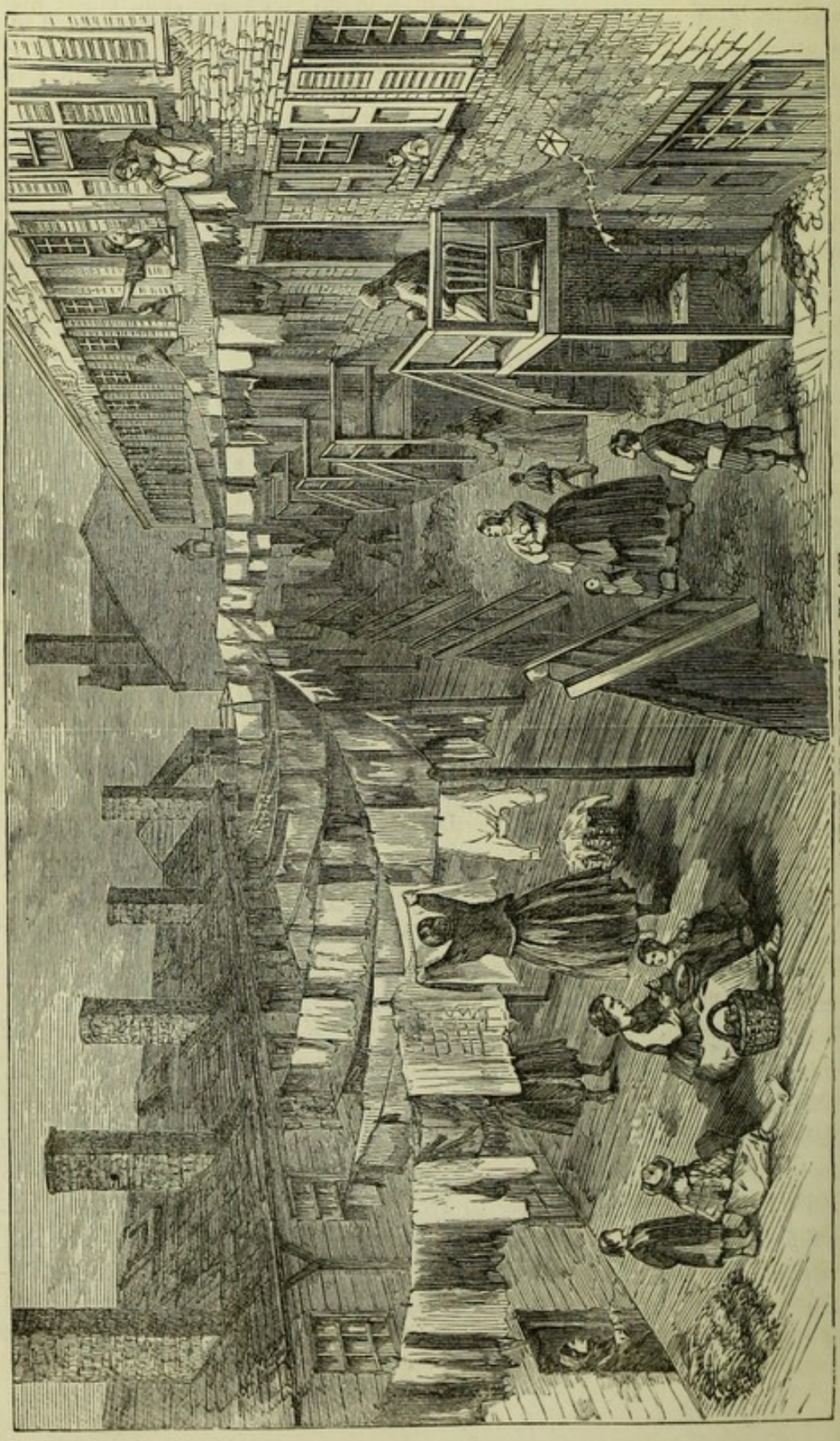
passages dark and dirty, yards, cellars, and privies carelessly attended to. Five small houses two and a half stories in height including the basements, each containing apartments for six families, front on an alley called 'Rivington Place,' located in the rear of Nos. 316 and 318 Rivington Street. This alley is always in a filthy condition.* The houses on it are small and overcrowded, and their occupants are constant claimants on the charities of the public dispensaries and hospitals. A detailed description of the squalor and uncleanness of this wretched quarter will hardly be necessary when we state the fact that the 30 families that reside in these five houses have no other water supply than that which two hydrants furnish in the exterior courtyard; while for this population of nearly 200 persons of all ages there are but two privy vaults, and, at the time of last inspection of the quarters, these vaults were filled nearly to the surface. Dr. Guernsey, who practises in this district, states that 'In the year 1849, 42 individuals died here in three weeks of cholera, and not one recovered that was taken sick. The reasons are plain: they have no ventilation, and the houses being double, the exhalations from one apartment are inhaled by the other.'

2. "TWELFTH SQUARE—*Sheriff to Columbia Street.*— * * * * On Sheriff Street is a group of rear tenant-houses adjacent to some stables. The northern section of these rookeries is popularly known as the 'Rag Pickers' Row.' This place and its inhabitants have been aptly described in the following language by Dr. Guernsey in a special report made to the New York Sanitary Association by that physician:

* * * * * * * * *

"'This nuisance should be destroyed. It is situated in the rear of Nos. — and — Sheriff Street. The houses are of wood, two stories with attic and basement. The attic rooms are used to deposit the filthy rags and bones as they are taken from the gutters and slaughter-houses. The yards are filled with dirty rags hung up to dry, sending forth their stench to all the neighborhood, and is exceedingly nauseous, operating upon me as an emetic. The tenants are all Germans of the lowest order, having no national or personal pride; they are exceedingly filthy in person, and their bed clothes are as dirty as the floors they walk on; their food is of the poorest quality, and their feet and heads, and doubtless their whole bodies, are anasarcous, suffering from what they call rheumatism, but which is in reality a prostrate nervous system, the result of foul air and indequate supply of nutritious food. They have a peculiar taste for the association of dogs and cats, there being about 50 of the former and 30 of the latter. The whole number of apartments is 32, occupied by 28

* See Diagram on page 178.



SCENE IN EIVINGTON PLACE.

families, number 120 in all, 60 adults and 60 children. The yards are all small, and the sinks running over with filth. The owner of one-half of this row is ———, and of the other ———. The latter gentleman is a wealthy man and lives with his tenants in the rear, although he owns the front house; he prefers the filth because he thus saves some money. He buys and sells rags, a perfect *chiffonnier*. Not one decent sleeping apartment can be found on the entire premises, and not one stove properly arranged. The carbonic acid gas, in conjunction with the other emanation from bones, rags, and human filth, defies description. The rooms are 6 × 10 feet, bedrooms 5 × 6 feet. The inhabitants lead a miserable existence, and their children wilt and die in their infancy.'

3. "Fourteenth Square—*Stanton to Houston Streets*.—'Cat Alley' is the local designation of a group of dilapidated tenant-houses in an alley on Cannon Street. The alley is unpaved, and is excessively filthy. The privy is a small and broken-down structure, covering only a part of the vault, which is now full almost to overflowing. The inhabitants are degraded, both physically and socially. In several of the domiciles, at the time of our last inspection, there was neither bedstead nor table. Twelve of these families were found in a wretched condition, and all the children we saw were covered with dirt, and presented the intensest aspects of scrofulous disease; their sore eyes, encrusted heads, and dehumanized appearance, told the story of want and neglect, and of greater evils to come."

Prevailing Diseases.—Typhus and typhoid fevers have been found prevailing in all sections of this district. Small-pox, scarlatina, measles, and pulmonary diseases are met with in almost every street. Typhus is the most typical of the preventable diseases that abound in the Eleventh Ward. The very large number of typhus patients that has been sent to the fever hospital from the tenant-houses of this district, constitutes but a small percentage of the total number of cases of that fearful disease. Small-pox, also, was found by the Sanitary Inspector to be prevailing very extensively. Cholera infantum and obstinate diarrhœal maladies were prevalent in the rear tenements, and throughout the lowest streets during the summer and autumn.

Increasing Causes of Insalubrity.—In this district we find a population of more than 60,000 persons dwelling upon an area of less than 3,000 ordinary house-lots of 25×50 feet, which gives an average of more than twenty persons to each such lot. Although this rate of population extending over an entire ward is worthy of remark, it would not be a cause of special insalubrity if good hygienic regulations prevailed. But in the entire absence of such regulations, and especially in

the close packing of particular sections of the district, we find reason to watch against the sources, as well as for the constant diffusion of pestilential diseases. The fact is undeniable that typhus has become localized in several of the crowded blocks of tenant-houses. The exanthematous diseases of childhood are persistently prevalent, and the virus of small-pox is continually being spread abroad from this ward. Yet the great mass of the adult population, by excellent habits of industry, and by virtue of the good constitutional health they fortunately possessed before becoming residents in the city—for the majority of adults in this district are immigrant artisans and laborers—is reputed in good health. The infants and children die in fearful ratios, and too many mothers find an early grave.

The particular causes of insalubrity in this ward do not require special explanation beyond that we have given; but in order to present a concise grouping of the material causes of faulty hygienic conditions in the crowded squares occupied by this population, we will here introduce an abstract of the records of the Sanitary survey of a single square, as entered in our Record-Book of Inspections:

"*Avenues B to C. Thirteenth Square—Twelfth to Thirteenth Streets.*

"Ground a marsh, reclaimed by imperfect filling in, and now imperfectly drained.

"*Buildings and Population.*—Front houses, 59.
Rear houses, 23.
Total, . . 82.

There are 12 alleys and 3 courts.

Total number of tenant-houses, . . .	70
Total population, nearly, . . .	3,000
Number of stables, ...	11
" slaughter-pens, ...	1
" junk shops, ...	2
" stores, ...	26
" dram-shops and lager, . . .	16
" groceries, with bar, . . .	7
" distillery, ...	1

"The domiciles are crowded, and, with few exceptions, filthy. The bedrooms are generally unventilated and dark. Typhus fever, measles, and small-pox were found prevailing at the time of first inspection. Nine patients with typhus had, within a short period, been sent to the fever

hospital from the row of tenant-houses on Thirteenth Street. The sanitary care of the privies has obviously been neglected, and like the stables and slaughter-pen within the square, they are altogether offensive to the senses, and perilous to the health of the inhabitants of the locality."

The chief causes of increasing insalubrity in the district are comprised in the brief abstract here given of a single block. They consist in the bad drainage, filth, overcrowding and incongruous packing of populous tenant-houses, and the grossest nuisances in compact contiguity. Throughout the ward there is a manifest want of intelligent and faithful sanitary supervision.

Remedial Measures.—The first and most indispensable means for improving the hygienic condition of this district, would appear to be a careful sanitary survey of every street and square. The evils that exist and are increasing in particular sections of the ward must be clearly ascertained by competent sanitary observers, aided by expert engineering talent. Not only should suitable means be used to procure improved ventilation and sunlighting in the tenant-houses, but several of the squares must be cleared of their nuisances—their slaughter-pens, faulty privies, etc., and, as far as practicable, the general and local drainage should be radically reformed.

The increasing business of all the great mechanical establishments along the eastern margin of this district, employing many thousand mechanics and laborers who seek homes within the Eleventh Ward, the industrious and worthy character of the nearly twenty thousand families that reside there, and the social and economical considerations that bear upon the whole subject of sanitary improvement of tenant-houses and tenant-house population of this important section of the city, demand that the work of such improvement should not be delayed.

THE ROYAL SANITARY INSTITUTE LIBRARY

REPORT

OF THE

SIXTEENTH SANITARY INSPECTION DISTRICT.

WILLIAM C. HUNTER, M. D.,
Sanitary Inspector.

BOUNDARIES.—*On the north by Twentieth Street, on the east by the Sixth Avenue, on the west by the Hudson River, and on the south by Fourteenth Street.*

TOPOGRAPHY.—The original condition of the surface as to elevation, is shown in the following table, which was obtained from Mr. James E. Serrell, City Surveyor, and is entirely reliable. It shows the elevation in feet and inches of each avenue and street corner above high-water mark:

STREETS.	Tenth Av.	Ninth Av.	Eighth Av.	Seventh Av.	Sixth Av.
Twentieth,	7.6″	13.6″	19.6½″	26. 6¾″	31.7″
Nineteenth,	7.6	13.3	19.0½	24.10½	30.8
Eighteenth,	7.6	13.3	19.0½	24.10½	30.8
Seventeenth,	7.6	13.3	19.0½	24.10½	30.8
Sixteenth,	7.6	13.6	19.6	25. 6	29.0½
Fifteenth,	7.6	13.6	19.6	25. 6	27.5
Fourteenth,	7.6	13.6	19.6	25. 6	23.7½

The soil is almost entirely a gravelly loam. This part of the city was in its earlier history considered the best agricultural district on the island, and was used for such purposes. On referring to the most authentic maps no water-course can be discovered entering the district. Natural drainage, as will be seen by reference to the table of elevation, is good; there is a gradual slope from Sixth Avenue to the river. No facts have been ascertained going to show that the topographical conditions of the district are otherwise than healthful.

Streets.—The direction of the streets is easterly and westerly, and of the avenues northerly and southerly. The former are, with the exception of Fourteenth Street, sixty feet in width between the buildings. Fourteenth Street and the avenues are of similar width, being one hundred feet between the buildings. The streets are all, with the exception of Fourteenth Street, paved with cobble stones. The same pavement is found in all the avenues except the Sixth, which, together with Fourteenth Street between the Seventh and Eighth Avenues, have the Belgian or block pavement. As an example of the neglected state of some of the street-pavements, I would refer to West Nineteenth Street between the Sixth and Seventh Avenues. The pavement here is usually out of repair, perhaps on account of the wretched sanitary condition of the gutters and surface of the streets. While the avenues are tolerably clean, some of the streets are extremely filthy. The most marked examples are West Sixteenth Street from the Seventh to the Tenth Avenue, and Seventeenth Street from Eighth to the Tenth Avenue. In these two streets there was observed a greater amount of preventable sickness than in other streets having as large a population. Cholera infantum, dysentery, and diarrhœa, were particularly noticed in Sixteenth Street between the Eighth and Tenth Avenues, where have occurred in five houses since May last four cases of purulent ophthalmia, four of scarlet fever and diphtheria, and five of cholera infantum. The latter was found between the Ninth and Tenth Avenues, where the street at every visit was found in an indescribably filthy state in consequence of deposits of garbage and slops. This was particularly noticed in front of the premises where cholera infantum had occurred. As another similar example of the influence of uncleanly streets on the health of their vicinity, I refer to West Nineteenth Street from No. 304 to 335. This street for about two hundred feet to the east, and the same distance to the west of Tenth Avenue, presents a marked contrast to the streets in the vicinity. Here are found some ten or twelve four and five-story brick tenant-houses. The street in front of these houses is such as may account for the excessive amount of sickness and mortality observed here.

Sewerage.—The sewers of the district are constructed of brick.

Their outlets should be six in number, while but five are found; the absent one being at the foot of Fifteenth Street. Each outlet opens at about four feet below high-water mark. Two are from three to four feet in diameter, the rest much smaller. On reference to the map it will be seen that a private sewer commences in the centre of the square inclosed by Fifteenth and Sixteenth Streets, and Ninth and Tenth Avenues. This is owned by the proprietors of a large sugar-refining estab-

lishment, who also own a large number of dwelling-houses on Sixteenth Street west of Ninth Avenue, and also on Tenth Avenue south of Sixteenth Street. Local drainage from the houses connects with this sewer. It passes through a little to the south of the centre of two squares, and reaches the river, it is believed, at Eleventh Avenue and Fifteenth Street, where it emptied at one time, it is said, into the river; but about three years ago, for certain reasons, the pier or dock was raised. The effect was to prevent the contents of the sewer being received into the river, and the result is that Fifteenth Street for one hundred feet or more east of the Eleventh Avenue is, and has been, constantly covered with this obstructed sewage for the last three years. It has really rendered Eleventh Avenue at the corner of Fifteenth Street impassable for loaded vehicles, and a private individual has been compelled to construct a bridge across this slough, that his teams may pass in safety. The effect of this on health cannot be definitely ascertained, as there are no dwellings in the immediate neighborhood. One of the chief reasons of the greater amount of sickness and mortality observed on the squares near the river, over those more remote, is attributable to either the faulty construction of the sewers or their outlets.

SQUARES.—30 squares are included in this district. They are all of regular shape. The sanitary condition of 4 is good, in 3 it is bad, and in 23 it is of a mixed character.

The causes of insalubrity are various. 1st in importance is *the large number of buildings used for dwellings, stables, factories, or other purposes, on a single square.* 2d. *Special nuisances.* 3d. Absence of, or imperfect local drainage and sewerage. 4th. Non-removal of garbage and street filth. 5th. Badly-constructed and neglected privies. 6th. Uncleanly and intemperate habits of the residents of the squares.

1st. *Number of buildings on insufficient space.*—The first point of sanitary observation is, that too many dwellings are crowded upon an insufficient amount of ground. In very many instances do we find on a lot of 25×100 feet, two dwellings of from three to four stories in height, the space between which being in some cases not greater than 10 or 15 feet, while upon both sides of these houses rise, either two high fences or two adjoining buildings. This is the only *yard* of these houses, and ordinarily contains the privy and Croton-water. The former, through entire absence of circulating air, diffuses its effluvium through the eating and sleeping rooms on the lower floors of both houses, especially the rear, and in a less degree the upper stories. The latter insures a constantly wet pavement and humid air. The square between Fifteenth and Sixteenth Streets and Eighth and Ninth Avenues, presents numerous instances of this condition.

Examples are met with at Nos. 240 to 260 West Fifteenth Street, and in at least four instances between the Ninth and Tenth Avenues on this street.

2d. *Special Nuisances.*—Of these the prominent are soap-fat factories and slaughter-houses. Of the former there are 6, of the latter 5. These will receive attention in another portion of this report.

3d. *Absence of, or imperfect local drainage.*—In the twelve squares east of the Eighth Avenue, the majority of the houses have under-ground drains, though some have surface local drainage. West of Eighth Avenue to the river but 3 of the squares have good local drainage, while in 12 it is surface. These 12 are embraced in the boundaries Eighteenth to Fifteenth Streets, both inclusive. It will be shown that within this territory there was found a larger proportionate amount of sickness and mortality than in other parts of the district. The cause of this lack of drainage is very plainly owing to either the poor character of the buildings, and consequent low rents, or illiberality of the landlords, but not to the want of sewers. This is particularly the case in Sixteenth, Seventeenth, and Eighteenth Streets, between Eighth and Ninth Avenues, which streets *between these avenues* have each a sewer, but few local drains are connected with it.

4th. *Non-removal of garbage and street dirt.*—On those squares where tenant-houses are most abundant, garbage-boxes are sources of great insalubrity. Being made of wood, they are soon destroyed under the combined influences of bad usage, rains, and slops, and long before they cease to be used are really worthless, as they allow the liquid portion of the garbage to leak out and flow into the gutters. Again, the great size of these boxes prevents in certain localities the removal of the entire contents at the daily visit. A part only is taken, the rest left to decompose and be covered with fresh accumulations, until the condition of the box can be better imagined than described. As the boxes become damaged they begin to disappear piecemeal (it is suspected for fire-wood), and a small mound of garbage being left, it is rapidly increased in size by the previous habits of the occupants of depositing such material in that particular place, until it becomes a large heap of putrefying animal and vegetable matter, disgusting to sight and smell, and detrimental to the health of the square on which it is found. A forcible example may be seen at this time in Nineteenth Street, between Sixth and Seventh Avenues. That street filth is left unremoved for too long a time, is a fact with which we are all acquainted; but in the poorest portions of this district, where the need of prompt and frequent removal is greatest, the neglect seems most apparent. Examples are met with in Eighteenth Street between Seventh

and Eighth Avenues, Nineteenth Street between Sixth and Seventh Avenues, and elsewhere.

5th. *Improper construction and neglect of privies.*—These as a source of insalubrity to squares are in proportion to the population of the square. With very few exceptions, the privies visited were entirely without ventilation or seat-covers. In many, the contents were much above the mark prescribed by law. About seven complaints have been entered in regard to this neglect.

6th. *Uncleanly and intemperate habits of the residents of the squares.*—Two squares in this district, namely, Eighteenth to Nineteenth Street and Sixth to Seventh Avenue, and Sixteenth to Seventeenth Street and Ninth to Tenth Avenue, show a correspondence in uncleanly habits of the people, number of low drinking shops, and amount of disease. On the first square mentioned there are 9 dram-shops of the lowest class, the domiciliary habits of the people are of the worst character, and measles, diphtheria, and pulmonary consumption had prevailed to an undue extent, Nearly the same remarks apply to the remaining square. Here, however, are 18 liquor, or liquor grocery stores ; 22 cases of typhoid fever, 4 of cholera infantum, 4 of purulent ophthalmia, and 4 of diphtheria, have occurred during a part of the past year on this square, and the opposite side of Sixteenth Street.

The Inhabitants.—It is almost impossible to state correctly the prevailing character of the inhabitants of the Sixteenth District, so thoroughly intermingled is the population. Probably one-third belong to the laboring class. United States and Ireland are the nationalities to a very large extent ; the latter bearing a proportion to the former of about five to three. Comparatively few Germans are to be found in this district. The Manhattan Gas Company, Eighteenth Street and Tenth Avenue, employ in their establishment a large number of men, who live in the vicinity. The occupation of others has not been ascertained. The majority of the residents of this district are dependent on their daily labor for support. In many parts of the district the people are very poor, yet respectable, hard-working persons.

Buildings.—The whole number of buildings of every kind in this district, as nearly as can be ascertained, is 1,644. They are classed as follows :

Private residences, ...	340
Rear buildings (dwellings), ...	192
Tenant-houses, ...	422
Stores, ...	393

Drinking places, billiard saloons, policy shops,	126
Factories (5 of which are soap),	23
Schools,	5
Slaughter-houses,	6
Stables,	129
Churches,	8

Not far from one-quarter of the buildings contain less than three families. These, however, must not be regarded as in necessarily good sanitary condition, as there are many small buildings of such size as to accommodate but two families. Fifty or thereabouts of the private residences are of brown stone, four stories in height, and of modern construction. These are almost exclusively situated on West Fourteenth Street. About one hundred are two and three-story frame buildings, of considerable age, but many are kept in good order and repair. The remainder, of brick, average three stories in height, and are not generally of recent construction. They are in width from 19 to 25 feet. Drainage, so far as observed, is usually good. Water is distributed to the different rooms or halls throughout the dwellings. Water-closet and bath-room are usually combined in some of the houses, in others the privies are kept in good order.

TENANT-HOUSES.—Of these there are 422. They are chiefly located on the streets, rather than the avenues of the district. Not more than 40 are found on the avenues, and these, with the exception of 5 or 6, are of four stories in height. The *age* of these houses is very difficult to ascertain, as the external or internal appearance of the buildings is not a safe guide. Tenant-houses, of recent construction, in consequence of ill-usage and neglect, soon come to present an appearance of age they do not possess. With few exceptions the large tenant-houses in the district are judged to be of recent erection. They are from 3 to 5 stories in height, and from 15 to 30 feet in width. They are chiefly of brick material. Very few *front* frame tenements are to be found in the district. But one entire block of uniform sized tenements is to be found in the district. On this square 133 houses are located, in which are 424 families. The block referred to contains a row of 47 tenant-houses of uniform size and arrangement. These houses are 5 stories in height, 15 feet in width, and 48 feet in depth. These houses represent the minimum width, and 30 feet the maximum width of the tenant-houses in the district.

DRAINAGE.—In the majority of the large tenant-houses where the street is sewered, there is a connection with it by local drains; but as these frequently have but one point of commencement, and that in the rear-yard, where the hydrant is located, it does not afford sufficient drainage.

Refuse water, etc., is without doubt allowed to accumulate, especially in the upper floors, to the injury of the health of the occupants. Another insalubrious feature in this mode of drainage is, that to some of the tenants it is more convenient to empty slops into the street than to deposit the same in the cesspool. In other localities the drains are of such faulty construction as to be positively hurtful to the occupants of the house. One such instance was observed in a house of respectable appearance, occupied by two families, in Seventeenth Street, where the drain was merely an *open trough* attached to the west wall of the house, and was intended to convey the waste water from the upper part of the house, water from the roof, and, it is said, the contents of the privy in the yard. The drain had become obstructed and overflowed its contents upon the cellar floor for 20 feet or more. This condition of the cellar occurred in May, and the inspection was made in July. One person had sickened, it was believed, from the cause mentioned. Nearly a similar state of defective drainage was found at No. 66 West Eighteenth Street, where a common board drain was used to convey the drainage from the rear-yard; it became defective, and the cellar received the drainage where the putrefying fluid remained, notwithstanding remonstrances of the neighbors, until by a complaint entered at the Bureau of Hygiene and Public Health it was remedied by the Metropolitan Police.

Surface local drains in other localities are plainly sources of insalubrity to the buildings with which they are connected. They become obstructed, and waste water, slops, etc., being prevented from finding its way through the alley into the gutter, flow back into the yard to a greater or less extent. Examples of this may be seen in Sixteenth and Seventeenth Streets, west of Ninth Avenue. In both of these streets the drainage is entirely of this character. The hydrant is placed just at the rear end of a narrow alley, not more than four feet in width, and running through the centre of it is a stream of filth. This is the drainage of these houses.

Water-Supply.—In 24 buildings the supply of Croton-water was found in the yard only; in 9 throughout the house; in 12 not mentioned. Whether the distribution of water throughout an entire house tends to a better sanitary condition of the house, depends entirely on the habits, whether cleanly or not, of the occupants. Two contrasting examples of this are afforded in houses No. — West Twentieth Street and No. — West Nineteenth Street. Both have had water distributed throughout the house. In the former it is in the rooms, in the latter in the halls. The first is a perfectly healthy house, the latter a very insalubrious one. In some of the houses water is distributed to each floor in the hall; this is

used by two or four families on the floor, and as the care of the sink devolves upon no one in particular, it soon becomes a source of insalubrity to the house, *e. g.* No. — West Nineteenth Street. In other houses the point of supply has been so placed as to compel occupants of one part of a floor to visit the apartments of other occupants on the same floor for water. This is the case in too or more buildings in Sixteenth near Tenth Avenue; also in Nineteenth Street near the same avenue. Four families occupy each floor, the water is placed in the two rear rooms on the floor; those occupying the front rooms visit their neighbors for water. It is very clear that with the tendency to discord and disagreement which exists to some extent among different families in nearly all houses, this arrangement subjects such people to shameful deprivation of a supply of water. The only method consistent with a sanitary condition of water-supply, is to distribute it to the apartments of each family.

Garbage and House-Slops.—In the poorer and most densely populated portions of the district only are these sources of insalubrity, and this it seems may be avoided. Let garbage-boxes be constructed of such size as to contain the daily accumulation; of such material as will not easily be destroyed (of galvanized iron for example), and which, while it is impervious to fluids, may be readily and entirely emptied; let a properly-constructed lid be attached, and the contents removed daily, and the sickening stench we now observe would then be avoided.

Location and care of Privies.—These form one of the chief features of insalubrity. Nearly all of them are two small in size and too few in number, and without ventilation or seat-covers. About twelve were found full to the floor timbers, or within one foot of them. In some cases the doors were found locked securely, and on procuring the key and inspecting the privy, such masses of human excrement were found on the seats and floors as would justify the locking of the door to protect unwary persons from injury. Occupants of rear buildings are the principal sufferers from this insalubrity. The proximity of privies is in some cases eight feet from the windows of rear houses; the odor in these is, especially at night, intolerable. Instances of the kind are to be found at Nos. 82, 283, and 285 West Seventeenth Street, and others. They are also too few in number; for example No. 108 West Nineteenth Street, where in the front and rear buildings more than one hundred persons live, who have one common privy, with a single partition dividing it, and but *four* seats in all. Twenty-five persons are expected to use one seat-opening.

Apartments.—The houses under discussion are so arranged as to afford one main room and one or two bedrooms to each family. The main room is used as kitchen, dining, and sitting-room. The bedroom between

the front and rear-room is dark; the hall bedroom, when there is one, is lighted and ventilated. It may also be said that in the recently-built large tenant-houses a small window opens from the dark bedrooms into the halls. This, in the majority of cases, is of no real benefit, as the halls are usually dark and unventilated. The dimensions are various; the following are examples of the usual size:

Main rooms, width and depth, 18×18 ft.; 19×11; 16×17; 19×14; 14×14; 14×14; 15×13.

Dormitories, width and depth, 12×10 ft.; 6×9; 10×12; 8×9; 10×9; 11×9; 12×8; 9×9; 9×9; 14×15.

Height of ceiling, 7 ft., 8, 8, 8, 9, 8, 8, 8, 8, 8, 8, 8, 8, 8.

Average cubic feet air-space to each person, 732, 864, 1,047, 671, 548, 346, 375, 894, 627, 2,576, 921.

Ground area square feet to each person, 33½, 58, 38, 113, 42, 80, 33, 30, 56, 23, 105, 20, 185, 83, 44.

Thus it is seen that 18×18 feet is the *largest* main room, and 14×14 feet the smallest. It is also seen that in but two instances was there 1,000 feet of air-space.

Ventilation.—In nearly all the houses inspected this was found deficient, both in the apartments and in the halls. As most of the tenant-houses are occupied by at least two families on each floor, it follows that no through ventilation can be secured. The main rooms are ventilated by two windows with sliding sash, which in most instances the upper section cannot be lowered. But very few, if any, ventilated by chimney fireplaces were noticed. The dormitories are without flues, save in a very few cases, and, with exception of the hall bedrooms referred to, without ventilation and light. The halls of the tenant-houses are very generally unventilated, except by the front door. The scuttle, if one there be, is generally closed and inaccessible, and in at least one-third of the houses there are no means of exit by the roof. In but two of the *large* tenements visited were there found any means of escape in the event of fire other than by the front door and windows. An occupant remarked they "*must either roast or break their necks.*"

Cellars and Basements.—Tenant-houses in this district are not, to a very large extent, provided with basements for residences. The few which were observed are of an unhealthy character. Two examples may serve to show this. At No. 206 West Sixteenth Street, two families, in which are thirteen persons, occupy the basement. It is so dark that ordinary type can be seen with difficulty. In the other case the people were healthy before entering the basement; since, however, they have been ill: the mother has phthisis. Of 24 cellars, note of which has been made, 4 only

were in good sanitary condition. The rest were more or less filthy, some indescribably so. One contained urine, bones, and soakage from the privy.

Dram-shops, or places where liquor is sold by the glass, are 121 in number.

Liquor stores (or grocery and liquor),	119
Billiard saloons,	2
Policy shops,	7

The liquor stores are nearly all of the class known as low groggeries. Eighteen of these are located on a single square—Sixteenth to Seventeenth Street, Eighth to Ninth Avenue—the population of which is the most depraved and unhealthy in the district.

STORES.—Are 403 in number. 119, or more than one-quarter of these, it will be seen are drinking shops.

FACTORIES.—There are 27 of these, as follows:

Soap factories,	6
Bleaching and dyeing,	3
Pickle,	3
Breweries,	4
Mineral water,	1
Rope,	1
Pottery,	1
Sugar,	1
Miscellaneous,	7

There is proof that soap factories exert an unhealthful influence on the inhabitants of their vicinity. This was particularly observed at No. 227 West Seventeenth Street, where an establishment of the kind is located. Independent of illness at 225, which has been considerable, and which cannot undeniably be attributed to other causes than the factory, I am told that when the process of boiling is in operation, some of the occupants of 225 are obliged to go into the street to escape the terrible odor. A somewhat similar report was obtained from occupants on the other side of the factory. There the people close their windows without regard to weather to escape its disgusting smell.

SLAUGHTER-HOUSES.—They are 6 in number:

Fronting on street,	3
Rear,	3
In good condition,	2
Insalubrious,	4

One of the latter, located in Seventeenth Street near the Tenth Ave-

nue, is very foul. Blood and filth are allowed to flow across the sidewalk into the gutter, making this portion of the square unhealthy. Diphtheria, purulent ophthalmia, and typhus, were observed in the street.

Gas-Houses.—The Manhattan Gas Company have their extensive establishment occupying the greater part of four squares. There is an offensive odor constantly emanating from the manufactory, but the diseases it produces must be ascertained. The operatives are subject of late to an affection of the eyes, produced it is said by a new material introduced into the manufacture of gas.

Stables.—129 are located in this district, and are principally private stables owned by cartmen and grocers: the rest private stables for pleasure horses. The principal insalubrious feature of these stables is their effect on rear buildings. This happens where a stable in the rear joins a rear dwelling next door. This is observed markedly in the rear of No. 138 West Twentieth Street. Again, a stable is placed in the rear on one street, and on the opposite street is a rear dwelling-house. The rear walls of the two buildings are within two to four feet of each other (this intervening space being an unwholesome "cloaque"), with a small rear bedroom window of the dwelling, and a breathing hole for the animal in the stable; both window and opening being on the same plane. This is precisely what is seen at No. 278 West Seventeenth Street, where the bedroom window must be kept constantly closed to prevent the unpleasant odor from the stable entering the apartment. Three cases of purulent ophthalmia have occurred here, and typhus prevails in the front house.

Churches, Schools.—The churches are 8 in number, and there are 4 public schools:

Industrial,	1
Ward (colored),	1
Primary,	1
Grammar, No. 11,	1

These all appear to be in good sanitary condition.

Vacant Lots.—73 in number:

In *bad* sanitary condition,	54
" not bad "	19

Twenty-four of these, located on Seventeenth Street, is made a place of deposit for ashes, garbage, dead animals and old boots. Ten are on the opposite square (Eighteenth Street), on the sites of dwellings burned two years ago. The privies of these dwellings have never been filled in, nor emptied of their contents. In other respects these lots are in a similar insalubrious condition to those just mentioned. It is believed that these lots have pro-

duced illness in Nineteenth Street. The remaining 20 in bad condition, are found between Nineteenth and Twentieth Streets, and Tenth and Eleventh Avenues. They are made a dumping-ground for manure and street dirt, and are highly offensive. Fortunately no dwellings are within a few hundred feet of these lots.

Nuisances.—Those of a public character have been noticed in a previous part of this report. The prominent are slaughter-houses, soap-fat establishments, liquor and policy shops. Private nuisances have been also incidentally noticed. The most remarkable are rear dwellings, of whatever character, and their (usually) attendant cloaque. This term has been applied by Dr. Harris to those spaces or inaccessible alleys, from 1 to 3 feet in width, which occur between two rear buildings on opposite streets, or between two rear buildings on the same street. These are undoubtedly sources of disease. They are made receptacles for all kinds of filth, not excepting human excrement; and one side or end of these houses is ventilated with such an air as may be imagined to be diffused through such a space. In one rear house in Sixteenth Street, where this condition exists, no less than 9 cases of typhus fever have occurred in less than one year.

Prevailing Diseases.—The prevailing diseases the past year have been cholera infantum, dysentery, diarrhœa, diphtheria, and measles. The first-named affections from the localities in which they have been chiefly observed are due to humidity, from imperfect drainage, to absence of sunlight, and ventilation in rear buildings, to personal and domiciliary filth and filthy streets, together with a high external temperature. The latter two are mainly owing to personal and domiciliary uncleanliness, with overcrowding. Seven cases of the last-named disease occurred in one house, in which were twenty-three children. The average cubic air-space for each person in this house was 694 feet. 3 cases of diphtheria occurred in another house, in which 73 persons reside; the cubic air-space for each person 697 feet.

Locality of Diseases.—In Tenth Avenue near Sixteenth Street, three or more cases of variola. In Nineteenth Street, No. 314 rear, 3 cases of variola were found in one room of a tenant-house. Between 20 and 30 cases of typhus fever have occurred in the last year in Sixteenth Street, Tenth Avenue, and Seventeenth Street west of Ninth Avenue, cholera infantum in Fifteenth Street near Sixth Avenue, Sixteenth Street near Tenth Avenue, Nineteenth Street near Seventh Avenue, Eighteenth Street near Seventh Avenue. Diphtheria in Seventeenth Street west of Eighth Avenue. It is of course impossible to say what particular cause

has produced these diseases, but the locality in every instance mentioned was insalubrious.

Insalubrious quarters have been noticed where the constant sickness and mortality rate is slight. This is accounted for in three ways: 1st. The people in such localities remove often, remaining perhaps not more than a month or two. 2d. They will deceive if possible the inquirer, apparently from sheer love of deception. 3d. Through fear of ejectment by landlord, or agent, who occupies perhaps a part of the house, information is withheld. Ejectment of the tenants really took place in one case, in consequence of complaint being made of a nuisance in the house. Disease from immigrants was observed in two persons only: this was typhus.

Remedial Measures.—A more thorough sewerage, and connections by local drains in all cases; Croton-water distributed to an apartment of each family; the removal if practicable of all bad rear dwellings; privies to be connected with the sewer; tenant-houses to be erected not to exceed three or at most four stories in height, and so constructed as to afford better through ventilation; a better class of garbage-boxes; removal of slaughter-houses and soap-fat establishments beyond the city limits; are some of the principal remedial measures which are suggested to the mind of the inspector, to place the district in a fair sanitary condition.

REPORT

OF THE

SEVENTEENTH SANITARY INSPECTION DISTRICT.

GUIDO FURMAN, M.D.,
Sanitary Inspector.

BOUNDARIES AND SQUARES.—*The Seventeenth Sanitary Inspection District is the northern half of the Sixteenth Ward, and is bounded on the north by West Twenty-sixth Street, south by West Twentieth Street, east by the Sixth Avenue, west by the Hudson River, and contains thirty full and five partial squares.*

TOPOGRAPHY: *Altitude of Surface.*—The highest point of ground in this district will be found in West Twenty-fifth Street, about 275 feet west of the Seventh Avenue, and is elevated about 41 feet above tide-water mark. The lowest being found in the Eleventh Avenue between West Twentieth and West Twenty-fifth Streets, it being only four feet above.

The following table, obtained from the Chief Engineer of the Croton-water Department, exhibits the present height, above high-water mark, of the several corners of streets and avenues:

CORNER OF STREETS.	Sixth Av.	Seventh Av.	Eighth Av.	Ninth Av.	Tenth Av.	EleventhAv.
West Twentieth,.....	31.7″	25.6″	19.6½″	13.6″	7.6″	
" Twenty-First,.....	33.3	26.8	20.4	13.6	7.6	
" Twenty-Second,....	31.6¾	25.6½	19.6½	13.6	7.6	
" Twenty-Third,.....	31.1	25.7¼	18.3½	13.4¾	7.6	
" Twenty-Fourth,....	34.6¾	31.6	18.4¾	13.3¼	7.6	
" Twenty-Fifth, ...	38	33.8	23.10½	18.4	9.9	
" Twenty-Sixth,.....	39.4	30.4	21.4	19.2	10.9½	4

PRIMITIVE TOPOGRAPHY.—The primitive condition of the surface of this district was undulating. Formerly three hills of considerable size

were found, viz., one between the Seventh and Eighth Avenues and Twenty-fourth and Twenty-fifth Streets; one between the Ninth and Tenth Avenues and Twenty-first and Twenty-second Streets; and the last one in a southwesterly direction, between the same avenues and streets. No original water-courses of importance traversed this section of the island, but a small stream coursed for a short distance through West Twenty-sixth Street, forming a bend in the vicinity of the Eighth Avenue and Twenty-sixth Street, pursuing a northerly and westerly course, and finally emptying into the Hudson River.

Geological Formation.—The geological formation is beds of loose sands, consisting of quartz; a coarse conglomerate, silicious and micacious rock; argillaceous matter, divided in irregular laminæ; limestone and calcareous sand; and finally of loam and clay.

The above-mentioned classes of rocks do not appear in an isolated form, but probably pass into each other. The planes of the various strata occur in nearly horizontal layers, with occasional cross stratification in the sandy; the greatest line of bearing being from the northeast to the southwest. In no part of the district can be found a wet sub or retentive surface soil, the *reclaimed* ground (which will be mentioned next) excepted, which is and always will be saturated with water and *organic matter*, both animal and vegetable.

Reclaimed Ground.—A little more than one-fifth of this district is reclaimed ground from the Hudson River; the materials used for this purpose being bricks, mortar, slate, gravel, ashes, coal-dust, street-sweepings, oyster, clam, lobster, and egg shells, pig's hair, shavings, straw, glass, carpets, brooms, refuse materials from tanneries, crockery, bones, dead animals—as cats, rats, and dogs; shoes, boots, feathers, oyster cans, old tin roofs, tin clippings, etc., etc.; and includes the whole of that section lying between Twentieth and Twenty-sixth Streets and the Tenth Avenue and the Hudson River, a small space at the corner of Tenth Avenue and Twenty-sixth Street excepted, which is natural.

Sewerage.—The district is imperfectly sewered. The Seventh Avenue, from Twentieth to Twenty-fifth Streets; the Ninth Avenue, from Twentieth to Twenty-third Streets; the Tenth Avenue, from Twentieth to Twenty-third Streets, and from Twenty-fourth to Twenty-sixth Streets; the whole of the Eleventh Avenue, and short spaces in Twenty-fourth and Twenty-fifth Streets, near the Eighth and also near the Ninth Avenues, have no sewers. The mouths of the sewers are above water at low-water mark; *and the pressure of the tides* entering them *forces the noxious gases into the dwellings and streets through the sewer connection.*

Natural Drainage.—The natural drainage of that portion of the

district west of the Tenth Avenue is poor; east of the Tenth Avenue is much better, as the foregoing table of altitude shows, the ground having an inclination from the north to the south, and from the east to the west.

THOROUGHFARES.—The cross streets run nearly northeast and southwest, the avenues crossing them at right angles. The former are about 60 feet in width, while the avenues are 100. They are all graded and paved, the Eleventh Avenue excepted; the paving in use being chiefly irregular cobble stones, in a few the trap-block pavement is employed.

The larger proportion of the streets is in a good condition, and has been kept during the past summer tolerably clean; *but the irregular interstices between the cobble stones prevent the entire removal of retained organic and other matter, however thorough the cleaning.* Many persons have an idea that heavy rains cleanse our streets and gutters thoroughly; it is erroneous.

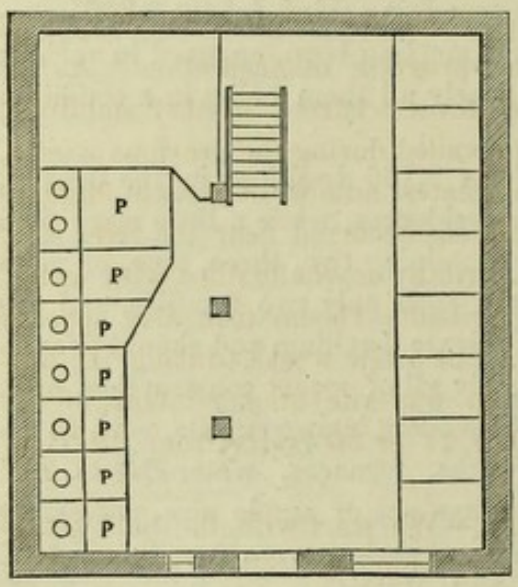
CHARACTER OF POPULATION.—Two-thirds (about 16,600) of its inhabitants are of the better class, the remaining third (about 8,300) consists of the lower. Most of them are American born, engaged in various occupations or mechanical pursuits; nearly all them being in a condition to obtain a comfortable livelihood.

CHARACTER OF DWELLINGS.—Of the 2,160 dwellings in the district, 1,006 are used exclusively as private residences, while a little more than half (1,154) are tenant-houses, each containing two, three, four, or more families, and two-fifths of these contain each only two families, and are entitled to all the considerations of a private dwelling, and should pass as such. The private residences are nearly all of recent construction, built of brick or brown stone, having all the modern improvements, such as the introduction of gas, Croton-water, baths, furnaces, water-closets, and proper sewer connections. The buildings are of ample size, possessing good water supplies. Of tenant-houses, a variety were found; most of them being of the better order, built within the last twenty-five or twenty-eight years, the materials used in constructing them being brick. Quite a number of these are frame buildings, which were originally intended and used as private dwellings. The drainage of many is defective, and very often absolutely wanting. Some of the drains are liable to obstructions, and cause overflows. But few of them have a water supply *in* the house, but none are without water in the yard. The facilities for disposing of garbage and house-slops are, in almost every instance, defective; the street gutters becoming, as a rule, the receptacle of the same.

PRIVIES.—The privies are located in yards, sometimes in cellars; or underneath the sidewalks, and in a few on each floor. Often the neighboring ground is covered with filth. Constant violations of the law, in

locating, constructing, and emptying these, were observed; as an evidence thereof we subjoin the following remarks noted down in our record book: "The privies (*two* in one) of Nos. — and — West Twenty-fourth Street need instant cleaning. They are overflowing the yard, and are very offensive. The privy at No. — Seventh Avenue, as in the preceding two adjoining houses, is in the yard, and adjoins the house, and is on a line with the southerly wall of house No. — (the adjacent house), which has a back area; the wall of said area being part of the foundation of the privy. At times the fluid portion of the privy oozes through its own and the area wall. If the privy were located and built in the manner laid down in the city ordinances (vide 'Laws of the Public Health for 1861, page 113, § 4'), this would not be the case."

Annexed is another wood-cut, portraying the privy found in the dark and damp cellar of the rear tenant-house No. — West Twenty-second Street.



This privy is used by 42 persons; it has five subdivisions, one for every two families. The compartments are so small that a person can scarcely turn around in them, and so dark that they have to be entered with an artificial light. The cellar itself, as has been stated, is damp, dark, and without ventilation. Under such circumstances the emanation of the excrementitious matter of 42 persons can find no escape; thus this privy-cellar is worse than a Stygian pit.

These are not isolated cases, neither are they the worst. A perfectly law-and-sanitary-abiding privy attached to a tenant-house, is the exceptional, while the reverse is the prevailing rule.

Size of Apartments.—The dimensions of the rooms and number of occupants vary much. There are bedrooms $9 \times 11 \times 10 = 990$ cubic feet, having no ventilation, occupied by 16 persons, which nets each individual about 62 cubic feet of atmosphere of a foul character. Another tenant-house, covering an area of 750 square feet and 38 feet high, is occupied by 10 families, consisting of 42 persons. This house has a narrow hall running through its middle, with apartments consisting of a kitchen and two dormitories for one family on each side. The dormitories are each $7 \times 9 \times 8 = 504$ cubic feet in dimensions. The rooms are

crowded throughout the whole building, each occupant having less than 240 cubic feet of space. Neither are these isolated pictures; many other dwellings are in as overcrowded a state. The effluvia in them is noxious and poisonous, caused by the gaseous emanations from the inhabitants, sinks, and drain-pipes.

Public Schools.—On inspecting them, many points for criticism presented themselves, but we will be content to mention, in the proper place, only the objections appertaining to their sanitary condition.

Prevailing Diseases.—Diseases in a topography and climate like this should be mild and few in number, and in a sanitary point of view the whole district will compare favorably with any other portion of the city, no considerable part of it having been during the past summer a sickly one; isolated places excepted. During the early summer months dysentery of a mild character prevailed in the district, west of the Tenth Avenue, on *reclaimed* ground. In all, nineteen houses were found where typhoid or typhus fever prevailed during the past summer, but not one case came under my personal notice during the progress of inspection. A few sporadic cases of measles and scarlet fever occurred in May and June, while diphtheria and small-pox had prevailed during the previous winter. It is worth remarking, that by far the greatest number of cases of diphtheria, tonsilitis, and pharyngeal inflammations occurred near the river side, especially in houses whose cellars are partially or wholly filled with water, infiltrated from the Hudson River. Articular rheumatism also appears to have a preference for this locality. For a few weeks (during the protracted heated term) cholera infantum was rife among infants of the poor; many cases proving fatal within 24 or 36 hours from the commencement of the disease.

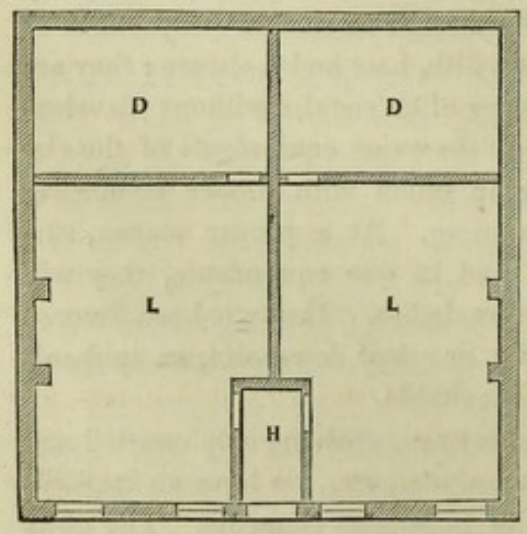
Preventable Causes of Disease.—We start with the bold assertion, that specific diseases *did not* spring from an original unit! They arise from a chemical combination of materials in certain proportions or equivalents. Some of these materials are filth, heat and moisture: they are violations of hygienic laws, and *may* very often coexist without developing any disease; inasmuch as absence of the exact equivalents of the elementary exciting causes, to coöperate in union with proper combining forces or affinities, are accidentally wanting. At a proper season, surrounded by favorable circumstances, and in due equivalents, they will give *spontaneous* birth to this class of maladies. Had we been favored during the past summer with much rain or a low dew-point, an epidemic of typhoid or typhus would have been inevitable.

In the putrefactive decomposition of sewage, evolving sulphuretted and carburetted hydrogen, ammonia, nitrogen, etc., etc., we have an invisible yet obvious source of a large amount of poisonous elements. The filthy

condition of the streets, avenues, and gutters, constitutes one great cause of sickness. In our opinion, the decaying organic matters found in them and the garbage-boxes form a prominent cause in producing dysentery and diarrhœa. The habit of sprinkling with water the thoroughfares during the heated term is pernicious, and becomes a prolific source of malaria. The water lodges in the irregular depressions between the cobble stones, moistening the organic matters retained by these interstices, which are acted upon by the sun, generating malaria. Cases of fever occurring in young children are frequently met with, that have been exposed to no other kind of malarial influences. The geological formation of the district is certainly not calculated to the production of malaria. In how far the thermo-hygro and barometrical conditions of the atmosphere may influence a special relationship between these diseases, is still obscure.

The universal imperfect water supply and drainage, with the poor facilities for disposing of garbage and offal, and filthy reeky outhouses, must *per se* create disease.

Another great cause of disease will be found in many dwellings which are out of repair, and their yards (if any at all) in so filthy a condition that to step into them would insure an encounter with filth of a most offensive character. Most of the larger tenant-houses are in a state of muckiness, and, as a rule, overcrowded, without ventilation or light. These are offensive enough (and incapable to preserve a normal standard of health), but the *crowded rear tenant-houses, completely cut off from external ventilation and perhaps light*, are still worse. They abound in dark, damp, and noisome basements and cellars, converted into sleeping apartments. To these the invigorating and health-preserving sunlight and fresh air are never accessible. As an illustration of one of these habitats, we subjoin the following sketch of the quarters of two families residing in the cellar of the rear house No. — West 21st Street:



L L are the living-rooms—nearly dark. D D dormitories—dark and *damp*.

Here we have low, damp, dark, and unventilated bedrooms, whose inmates respire a murky air, and consort with snails, spiders, and muck-worms. These underground habitations are most pernicious in laying the foundation for, and developing strumous ophthalmia, hip-joint, and spinal disease of the spine, diseases of the respiratory organs (the chief

of which is consumption), rheumatism, which in turn produces organic diseases of the heart. A protracted residence in these cellars and basements is sure to develop a strumous or tubercular cachexia.

The following case, copied from my daily Record-Book, is but an example of its class, the homes of ignorance and indigence:

"At No. — West 25th Street, a wretched tenement of two apartments, the rooms occupied by one family. The sitting-room is about 10 × 12 feet, and the bedroom about 5 × 12, *without a single window or air hole*. These rooms were occupied in the hot month of July by a poor colored female, having pulmonary consumption, and her two children. Here she died, shortly after we made the inspection of her domicilium; having no money or friends a Christian burial was denied her for four days, although the neighbors acquainted the police of the fact, and they the Health Warden; but this official (a brick-mason), having a high regard for his olfactory sense, neglected to perform his duty until Dr. Wm. C. Hunter and myself drove him into the performance of the same."

Improper food, Intemperance, etc.—In connection with the overcrowded condition of tenant-houses, we must incidentally state that the diet of many families occupying this class of houses is insufficient in quantity and quality. To meat, fresh vegetables, and fruits, they are almost strangers, and subsist on inferior farinaceous products. This mode of living with their surroundings produces a low standard of health, and oftentimes disease. It is impossible that the milk of a mother or a nurse residing in one of these wretched hovels or dungeons, can be of a good and sufficient quality and quantity for the nurseling; it must produce a faulty alimentation or assimilation, and become the predisposing, if not exciting cause of cholera infantum, which is fully developed by meteorological influences during the summer months. Such milk is deprived of the soluble salts of iron, potash, and lime, which infants especially require at the period of rapid growth, for the formation of blood, muscle, and bone.

Deviations from a healthful standard of hygienic supplies, such as fresh atmosphere, light, and electricity, and the vital stimulus of alimentation, constitute some of the principal causes of disease. The filth observed in a great number of tenant-houses, in the bedsteads, bedding, clothing, and carpets of the occupants, is detrimental to health. The poisonous drinks which are indulged in by this class of people, tend to deteriorate and degrade the race. Manure heaps saturate the soil they occupy with organic matter, which, under the joint action of sun, heat, and moisture, must produce disease. The sale of stale vegetables, fish, and unripe fruit by street-hawkers to the poor, is a most potent cause in producing cholera morbus, diarrhœa, and dysentery. We have repeatedly

observed the ill-effects which followed the use of such articles of diet. For a full account of these, I take pleasure in referring to the observations made by Dr. J. Lewis Smith, in the Twenty-fifth District.

Faulty Hygiene in Public Schools—The public school rooms are overcrowded, the ventilation defective, the atmosphere is too dry for the respiratory organs, and the hours for study too long.

Conclusions.—But the causes observed and enumerated appear hardly sufficient to account for all the sickness in our midst. Causes which have probably hitherto eluded our observations, may play an important *role* in increasing our rates of sickness, and we therefore subjoin the following remarks:

How are Communicable Diseases spread.—Communicable diseases are conveyed, to our positive knowledge, by paper-money, second-hand furniture, clothing, bedding, and public conveyances. For most of these we have personal evidence, namely: In the spring of 1861, we had occasion to attend a young gentleman with small-pox, who was clerk in a banking-house. Where and how he contracted the disease was unknown to him; but several weeks after his recovery he learned that he had opened and counted, a few days before his sickness, a large package of money forwarded by a Western bank, whose cashier, residing in the bank building, had recently suffered from the small-pox.

As to the matter of public hacks, we would state that, some five years ago, we had under our professional care a young gentleman with varioloid. Being an inmate of a New York "boarding-house" (houses of starvation), he was anxious to go to his sister's home in Williamsburgh; he was accordingly transferred on the second day of the eruption across the river, in one of the public hacks. It is very probable that any person unprotected by vaccination, riding very soon afterward in this carriage, would contract the disease.

A year and a half ago I attended the first officer (now a captain) of an emigrant ship with typhus fever. On recovering he returned to his vessel. His captain, at our suggestion, prohibited him from bringing his clothing on board. He disposed of them to a second-hand clothes dealer. There was danger that whoever came in contact with these garments would contract typhus!

Still another case: Last spring, while riding in an Eighth Avenue car, we sat near a poor woman who had a sick child in her arms. The child coughed and sneezed, and appeared very uncomfortable. A veil becoming displaced, with which the child's face was covered, I beheld a fine case of measles. For an interesting statement how communicable diseases are transferred, we refer the reader to the able report of Dr. Ache-

son. It is certain that, aside from the insalubrious conditions of these cases, they are often the means by which diseases are conveyed from one person to another, which no legislation can arrest; and the only advice we can give to the public is, that they should never enter these cars when *crowded* or *ill-ventilated.*

One of the most obvious causes which increase our mortuary tables each year, lies in the fact of the people being deceived by ignorant, so-called physicians, and advertising charlatans. The constant and indiscriminate use of patent medicines and domestic remedies—the former frequently endorsed by clergymen and other kindly-disposed but mistaken people—are all causes tending to shorten life. But for our timely interference, the MORPHINE contained in *Mrs. Winslow's Soothing Syrup* would have destroyed one of our little patients.

As the result of our observations and comparison with the European cities we have visited, we beg leave to express the opinion that these causes require the enactment of stringent laws, which if enforced would result in the preservation of the public health; and we therefore respectfully suggest a few

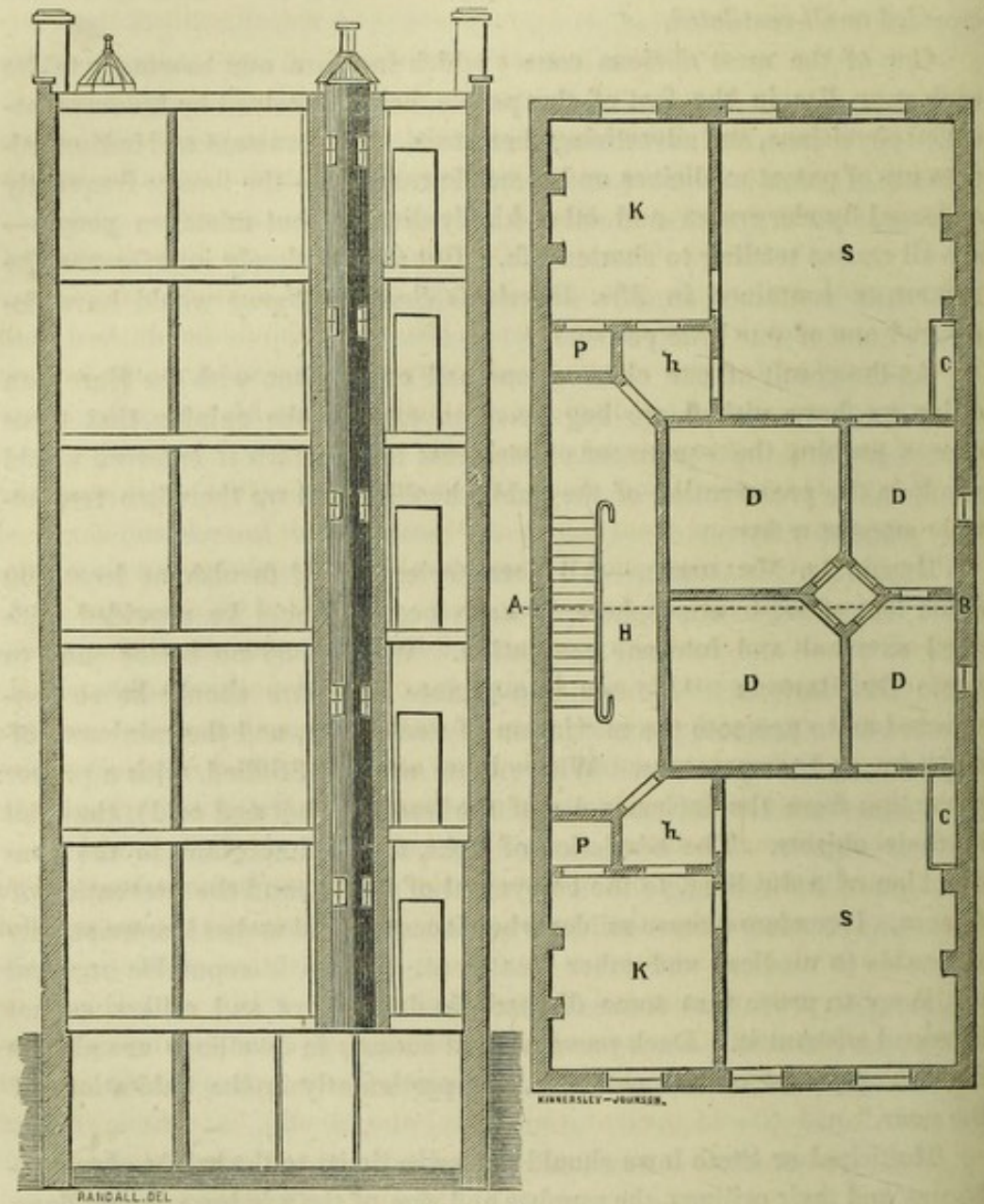
REMEDIAL MEASURES.—All dormitories should furnish at least 800 cubic feet of fresh atmosphere to each occupant, and be provided with good external and internal ventilation. We can do no better than to quote Dr. Barton: "Houses in a climate like ours should be so constructed as to promote the maximum of ventilation, and the minimum of moisture and temperature. Where these are not fulfilled, with a proper protection from the inclemencies of the weather (hot and cold), they fail in their objects. The admission of light, too, is important in the construction of a dwelling, to the enjoyment of health, and the prevention of disease. It renders disease milder when it occurs, and makes it more readily amenable to medical and other treatment. There is reputable medical testimony to prove that some diseases, in dark alleys and cellars, cannot be cured without it. Dark passages and corners in dwellings are always the hiding-places of dirt and filth, and particularly in the habitations of the poor."

Municipal or State laws should prescribe limits to the height of tenant-houses and their ceilings, the number and size of the windows, doors, flues, and fire-places.

As a model for a tenant-house we add the following plan of the tenant-house No. 107 West Twenty-fourth Street. It is simply a plain adaptation of common ideas and means of domestic convenience to the ordinary house with family domiciles front and rear on each floor. And this plan would be still better were the lobby (*h*) a little more spacious, with a

door communicating with the larger of the bedrooms, (D), so as to add certain advantages of privacy and *through* ventilation, independent of the living-room (S).

IMPROVED TENANT-HOUSE.



S, Sitting-room. D, Dormitory. K, Kitchen. P, Pantry.
H, Principal hall. *h*, Small hall or lobby. C, Closet.

Each bedroom is made to communicate with a ventilating shaft by means of sliding windows.

The above house is occupied by 8 families, consisting of 18 adults and 11 children. In connection with all the conveniences for a small family, we found excellent ventilation and light.

Each dwelling should be provided with a yard in the rear at least as large as the ground is on which the dwelling stands. In this way we prevent the criminal custom of building houses back to back, which destroys ventilation and the free admission of light.

Cellar Dwellings should be Prohibited.—The use of cellars or underground rooms as dwellings must be prohibited by law. In these we almost invariably found a low dew-point and a stagnant atmosphere. In such habitations, the elimination and evaporation of the excretions is perceptibly arrested; and the most noxious of all substances to the human body is its own worn-out materials.

Every tenant-house should be furnished with a sufficient number of privies, with a thorough system of cesspool drainage, having an ample supply of water and drain-traps or valves. No privy should be emptied until its contents has been deodorized. A correct system of draining-sewers, either by increasing their diameter to facilitate hand-labor, or by a process of flushing, is strongly recommended.

Sewer Gases.—Means must be adopted to prevent or destroy the noxious vapors arising from sewers. Many methods have been suggested and tried; but the most effective and durable one, and one involving the least expense and care of destroying these, with which we are acquainted, is wood or peat charcoal, as recommended by Dr. Stenhouse. The application of this remedy is very simple, and consists in depositing a few pounds of charcoal in a perforated wooden, metallic, or earthen vessel or box. Such boxes or vessels containing charcoal are tightly fitted in places where these gases escape, in such a manner that they must pass through the charcoal as through a filter.

The universal setting out of trees in the streets is recommended. The nearer a city approaches the condition of rural districts, the nearer will it reach a state of salubrity.

We earnestly recommend the establishment of a Board of Health or Health Department, to consist of one or more competent *Doctors in Medicine*, *Architects*, *Surveyors*, and *Civil Engineers:* this board should appoint to each ward one competent physician, who should be styled *Medical* or *Health Officer*. They also may appoint such other persons as assistants to the last as may seem necessary to carry into effect the sanitary laws, and delegate to them the necessary powers, subject to the approval of the Board of Health.

REPORT

OF THE

EIGHTEENTH SANITARY INSPECTION DISTRICT.

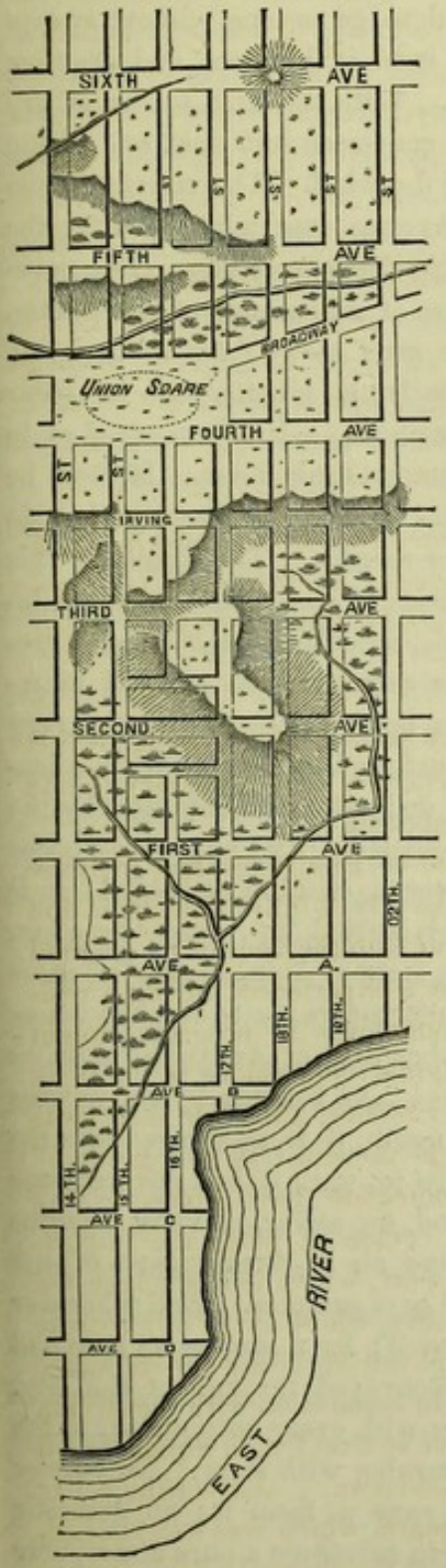
H. M. FIELD, M.D.,
Sanitary Inspector.

BOUNDARIES, ETC.—*The Eighteenth Sanitary District comprises the southern half of the Eighteenth Ward, and is bounded on the north by Twentieth Street, on the east by the East River, south by East Fourteenth Street, and west by the Sixth Avenue.*

TOPOGRAPHY.—As the map on the next page will convey a correct idea of the natural topography of my district, it is only necessary to add a few statements, as illustrative, in this connection.

General Viele, the President of the Board of Engineers, has truly remarked: "It is folly to suppose that when the city is fully built upon, and the valleys filled up, no water will find its way into the beds of its original streams. I know to the contrary; and my own experience, during a residence in a southwestern city while an epidemic was in progress, taught me that in all localities where there were original depressions in the topography, the disease raged with the greatest violence, although there was no apparent presence of water or even of moisture in the ground." Several striking illustrations of this phenomenon have come to my knowledge within the range of this district. One of particular importance will be adverted to further on in the report, which indeed suggested the ætiology of an epidemic in a certain locality, where every other cause has seemed inadequate to account for it. A physician of my acquaintance has the particulars of a case which occurred in connection with the stream which formerly flowed through a part of what is now Union Square. All appearance of this stream has long since passed away; and yet the cellar of a house on Seventeenth Street near the square, which was ascertained, on inquiry, to have been built immediately upon the channel of this former

MAP ILLUSTRATING THE MEDICAL TOPOGRAPHY OF THE EIGHTEENTH DISTRICT.



stream, was found to receive water at certain seasons of the year; and until it was relieved by extending the sewer, an especial arrangement was necessary for collecting the water and conducting it off. The gentleman who lived in this house suffered much of the time with "chills and fever," which, it was satisfactorily ascertained, could have been contracted nowhere except in his own home. I shall have occasion to allude to this subject again in the course of my report, and other illustrations will then be given.

Streets and Avenues.—All the streets in this district are parallel to each other (making the common distinction between streets and avenues, for convenience' sake), and so are the avenues. Broadway, however, so far as it extends in my district, runs diagonally to the avenues. The pavement of the principal avenues is the trap-block, which, in many respects, is a perfect model. But the pavement of the streets, except of a small portion of West Sixteenth Street, where the pavement of the avenues has lately been extended, is *cobble stone*, and is, at the best, uneven, containing frequent depression. In the eastern part of the city especially, these holes are very common, and often large and deep. For cleanliness and facilities for thorough sweeping, no pavement yet introduced surpasses the Belgian. In the cobble stone there are necessarily large spaces between the stones which must be filled with sand. More or

less of this filling is apt to be displaced at any time. The same broom may sweep a portion of the sand out of a cavity, and a part of the filth which is lying about on the street into it. Where there are so many *traps* for filth, and where the streets are allowed to go so long without sweeping, as are those streets of our city which need it the most, and are then swept carelessly, it becomes a serious evil. With the first season of dry weather the organic part of this refuse is converted into dust, and, rising into the air, is borne in every direction by the wind. The streets in the eastern part of the district, east of First Avenue especially, have for the past six months been in a most inexcusably filthy condition. The pavement here is uneven, there are deep gutters at either side of the streets, filled with foul slops, in which float or are sunk every form of decaying animal and vegetable matter. Occasionally, at remote and irregular intervals, carts come round, and these stagnant pools are *dredged* so to speak, and their black and decayed solid contents raked out. If there be any thing on earth that is "rank and smells to Heaven," these gutters do on such occasions, especially in the summer months. The streets in this part of the city are the principal depositories of garbage. In some instances heaped-up at the sides of the streets, in others thrown about promiscuously, the event in either case is the same, if it be allowed to remain day after day, as it usually is. After having passed through every stage of decay, after having corrupted the surrounding air with its pestilential smell, it gradually becomes desiccated and converted into dust by the summer sun and the constantly-passing vehicles. And now every horse that passes stirs it up, every vehicle leaves a cloud of it behind; it is lifted into the air with every wind and carried in every direction. Those who are directly responsible for this state of things suffer no more than the cleanly and thrifty who are so unfortunate as to live anywhere the wind, blowing from this quarter, reaches them. And what a *pulvis compositus* is this to breathe into the lungs! As we pass by our mouths become full of it, we draw it in with our breath, it is swallowed into the stomach, it penetrates our dress and clings to, until it has covered, our perspiring skin. Surely no dumping-ground, no sewer, no vault contains more filth or in greater variety than did the air in certain parts of our city during the long season of drought the past summer. And wherever the wind blows, this foul corruption is carried; by a process as sure and universal as the diffusion of gases, is it conveyed throughout the city. Such, often, is the air drawn into the lungs with every respiration, of the poor sufferer stifled with consumption or burning with fever. No barrier can shut it out, no social distinction can save us from it; no domestic cleanliness, no private sanitary measures can substitute a pure atmosphere for a foul one.

The forbearance of nature is wonderful; her power and her readiness to adapt herself to conditions the most strange and unnatural: but surely the forbearance of man is even more marvellous, at least that part of the human family who live in this city! It is only the very lowest orders of animated beings that draw their life and sustenance from filth and ordure, and at the same time that they grow and fatten upon it increase the heap; and what could evidence a sadder lapse from probity and honesty, or a lower status in the moral scale, than the "specious way of doing nothing" of certain of our city officials?

Squares.—The district includes 55 squares. As a rule, those west of Third Avenue are in a tolerably good sanitary condition; those east of Third Avenue, as far as to First Avenue, are in a mixed condition; while that of all the section east of the latter boundary line is positively insalubrious. This rule has, of course, a few exceptions. The greater part of Second Avenue, for instance, from Fourteenth to Eighteenth Street, in respect of all sanitary considerations, will compare favorably with the same extent of Fifth Avenue: or, again, Eighteenth Street, nearly to the corner of First Avenue, is well built-up with highly-respectable private residences, and is in as sanitary a condition as its surroundings will admit of.* On the other hand, on Sixth Avenue, between Fifteenth and Sixteenth Streets, are several tenant-houses, and especially a rear house which can assert no privilege, aside from the fact of better neighborhood, over the average of tenant-houses in the east part of the district.† As a rule, however, where exceptions on either hand will about balance each other, we have 27 squares belonging to the first class, 13 belonging to the second, and 15 belonging to the third.

The Inhabitants.—The subdivision under the last head of squares answers very well for the people dwelling in the different series of squares. The first division contains the principal part of the wealth of the district. But if the inhabitants are more wealthy, they are in no way more respectable than those who live in the second division; they have in their favor, however, more complete sanitary conditions, having more space, and streets much better built and better kept. In the second division are found most of the artisans and trades-people of the district, with now and then exceptions of wealth and social position as magnificent as any thing which can be found in the first. But this class of the population, the *bourgeoisie*, although it predominates in the second section, is distributed throughout the entire district by means of the avenues. Each of the three

* Square No. 35, in the Record-book, p. 65.

† Square No. 11, in the Record-book, p. 40.

sections has a principal avenue, which is almost altogether given up to trade. The third division is almost entirely occupied by the laboring class, living in tenant-houses, and here we find sanitary regulations almost entirely neglected; here are the most wide-spread sickness, the most fearful mortality, and the greatest amount of immorality, and misery, and want; yet there is no inherent reason why the laboring class, in a country like ours, should not be as healthy, as long-lived, and as moral, and influential, and independent a part of the community as it is an indispensable part. Seldom is it the case that some prevailing disease is not at work in this part of the city. If a pestilence, yet unsettled, is about in the air, here are the *tentacula* which are thrown out to seize hold of it, and to retain it until it has established a firm foothold in our midst. There is no natural reason why our city should not be, in its every part, the most healthy city of the country. Above all things, nature has given security against its being, as now it is, the *most unhealthy* city of the Northern States; with broad rivers washing both its sides, and a wide bay at its base, whose rapid tide sweeps away all that is thrown into it, no more to return, it might be both clean and healthy. But we now find fever-nests instead of healthful homes for the laboring classes, and we see filth instead of cleanliness.

As regards the nationality of the population of this district, nearly all east of First Avenue are Irish and of Irish descent, with the occasional admixture of a family of Germans. More of the latter are found in the middle subdivision than in any other part; in fact, quite a respectable proportion of the population of that section are Germans.

Buildings.—It will be seen by the statistics which I have grouped together at the end of this report, and by reference to the record-book of my sanitary survey, that quite a large proportion of the dwelling-houses in my district are private residences. Many of these are quite palatial in construction and extent, and in their furnishing; yet it is too often the case that, amid all the luxuries and conveniences which wealth can procure, sufficient attention has not been paid to the laws of health, either in the original construction of the house, or in sanitary care and inspection afterwards. The method of ventilation is often inadequate, or its necessary arrangements are out of repair; drainage and sewerage are more or less neglected, and vaults are not emptied and cleansed as often as is consistent with perfect health. The private residences, especially the modern ones, are generally as commodious as could be expected of houses in a city —many of them having very generous accommodations, both as to house-area and attached grounds. With regard to the tenant-houses, on the contrary, no more space is allowed than is absolutely necessary; their location

in respect of each other, their subdivisions into apartments, and the ground allotted to each house as a "back yard," all show the most rigid and mercenary economy of area and room. Each family is provided with two rooms, connected together: a *living-room*, which generally measures 12 × 14 × 8 (or 8½) feet, and a *dormitory* from one-third to two-thirds this size. The majority of the tenant-houses are four stories in height, and have two families to each floor. About three-fourths of the whole number in the district are built on this plan. The remaining one-fourth, I should judge, would be about equally divided between houses having four, and those having five stories, *with four families to a floor*. A little is gained, and but little, in the former case; the rooms of the houses which have but two apartments to a floor generally have three windows instead of two, and as much more room only as is necessary for the inserting of a third window.

There is generally no means of ventilation aside from what the tenants can secure by opening the doors and windows; sometimes there is a scuttle or glass window in the roof, but not for ventilation.

No argument or entreaty will prevail upon them to keep their rooms sufficiently aired—in the only way left to them, by opening their doors and windows—so long as they have to buy their own coal. This general lack of means for ventilation, and of disposition to avail themselves of such means as they have, is apparent none the less in the effects which it produces, than in the observation of the fact itself. How often have I been led to notice the striking contrast, in respect of all that denotes health and its opposite, between a young mother and her family, tenants of one of these non-ventilated apartments, and her sister who is "out at work" with some respectable family in the city, and who happens at the time of my visit to be temporarily at the house. Nor is it "care and sorrow and child-birth pain" alone which have caused this sad declension from health, in the former case. You will find no member of this family, however young and free from domestic care, with the blooming cheek and the bright eye and the elastic step of their temporary visitor, who has the range of a ventilated house, and who sleeps at night in a well-aired chamber. This same fact—the evils attending a constant want of pure air—is strikingly displayed in connection with certain forms of disease. In typhus and typhoid fever the system requires a supply of pure air, even more than in health, to enable it to throw off the zymotic element in the blood. It has happened to the experience of every one who has treated many cases of these fevers among our poor tenantry, to observe how sudden and rapid a change for the better has been set-up, after the removal of the patient from the narrow and close dormitory to the common-room,

where ventilation can be secured. This, in fact, is the first step in the treatment; nothing else should be done until this change has been effected. And the effect in some cases which I have observed, has seemed well-nigh miraculous; and such as has led me occasionally to refuse to undertake the treatment of a case where the patient's friends would not permit the removal required. It is like food and drink to a man half famished; and it shows how ill the system can endure any additional blood-poisoning, when it is already laboring under and striving to throw off a disease induced by toxæmia. *

Basements and Cellars.—But a small proportion of the tenant-houses in my district are provided with a basement floor, and very few of the tenantry live in what could strictly be called *cellars*. A few striking cases, especially of the latter class, will be found noted from time to time in the "Record-book." The cases that do exist are generally as bad as they well can be. There are a few cellars so dark that one cannot see to read in them, unless by artificial light, except for a few hours in the day, by sitting close to the window; and there are many basement rooms into whose gloomy recesses not a single direct ray from the sun ever shone. The latter are, as a rule, by half their depth below the level of the street. Dark and damp, with very little chance for the circulation of air, it would be difficult to imagine a human being more completely beyond reach of sanitary provisions. And when we consider that four large families often crowd this subterranean floor, no words are needed to show their condition deplorable. That a generally-impaired vitality is promoted by living in this unnatural way—"a nameless, ever new disease"—there can be no question; that these people will be especially prone to whatever form of prevailing sickness may be about in the community, no one can doubt; but whether there is any specific cause involved, capable of producing definite forms of disease, is more difficult to determine. Alison and Bandelocque ascribe more influence in the production of *scrofulous diseases* to impure and confined air, than to an impoverished diet and improper food. And here I will introduce certain statements bearing upon this general subject. Says Dr. Mussey (one of the noblest, as he was in the days of his activity one of the most deservedly eminent of our profession), speaking of ventilation, etc.: "Is it to be wondered at that consumption is, as I am assured by some of my friends, far more common among the Green Mountains of Vermont than it was twenty-five or thirty years ago, before

* "The habitual want of pure air exerts an unfavorable influence on the state of the blood, causing imperfect development of the plasma and corpuscles, which, instead of contributing to the nourishment of the tissues, *degenerates into scrofulous and tuberculous matter.*"—*Williams' Principles of Medicine.*

the *close stove* was used, as now, for the open fire?" In "Blackwood's Magazine," September, 1828, may be found the following valuable statement: "The deaths of new-born infants, between the ages of one and fifteen days, which, in the Dublin Lying-in Asylum, in the course of four years, amounted to 2,944 out of 7,650, were suddenly reduced to 269 during the same period, after the new system of ventilation had been adopted." Dr. Watson refers to a certain epidemic of fever in Ireland where "the mortality among the patients who were placed in open sheds upon straw and left with very little medical attention, or even any great amount of attention from others, was very small indeed;" although the epidemic, under certain other circumstances, proved very fatal. Dr. Christison's testimony, applied to the subject at hand, is as comprehensive as it is explicit. He says: "The infection of continued fever is, for the most part, by no means virulent. But it is nevertheless certain, so far as minute observation of several violent epidemics during the last twenty years can determine the point, that moderate precautions will render the infectious atmosphere inert. *Cleanliness and ventilation will speedily extinguish any epidemic.*" Much more testimony upon this and collateral points might be cited, but we have not the space—enough has been already presented to suggest conclusions.

An epidemic may *die out* among these crowded houses, as every epidemic must, after running on a certain length of time; but it is almost impossible to arrest it before it has reached its natural term. This fact will be further illustrated when we come to speak of prevailing diseases. We need no new name and theory from army experience* to account for sickness, and pestilence, and death, among people living in this unnatural way. Nature is lavish of air, and sunlight, and water—they all come from her hands pure and unmixed; and man must receive them and use them in the same bountiful measure in which they are bestowed, if he would maintain a standard of perfect health. Several illustrations of the foregoing principles, which we had intended to introduce, have been crowded out, and will be found in the "Record-book," † under the head of *Special Cases.*

Dram-Shops, etc.—The number of drinking saloons, etc., in the Eighteenth District, affords a ratio of one to every twenty-two dwelling-houses. But a few words of explanation must be given to prevent misapprehension. If every house contained only one family, and there were still the same number of families in the district as now, taking the population of the tenant-houses only into consideration, we should have an approximate ratio of one liquor store, or bar, to every eighty-eight families.

* "Crowd-poison." † Page 100.

When we add to this the population of a few hotels and boarding-houses, and of such houses as contain more than one family, although not boarding-houses, we should, at the least computation, have the ratio one to one hundred.

I have included lager bier saloons under this head; for, although bier may be the principal drink retailed in these places, yet every other kind of liquor is kept on hand and provided when called for. Apparently quite insignificant, and yet productive of great evil, and probably alluring more generally to temptation than any other class of bars, are the small whiskey-shops, kept on the first floor of tenant-houses. Here the vilest kinds of liquor are sold *cheap;* and many a laboring man is here tempted to part with his earnings who would never be decoyed into the larger and more fashionable saloons. Still another class are the corner liquor stores, which make such display with their freshly-painted hogsheads at the doors and windows, and their flashy glasses at the bar. These stores make an exterior show of respectability and good order, except it be on election-days, on which occasion certain well-known political purposes which they subserve secure them from the general order which requires all stores of this sort to be closed. But it is the smaller stores we have already considered which swell the number, for they are found everywhere. Obscure as they are, they are probably more concerned in riot, and misery, and crime, than larger stores, where vastly greater capital is invested.

Stores, Markets, etc.—My statistics present the large number of 308 stores and shops—exclusive, of course, of the class just considered; or the approximate ratio of one store to every five dwelling-houses. But the same consideration obtains here, as regards families, as in the last section. More than half the number given would more properly be called *shops* than stores. Such are very numerous throughout the tenant-houses; if it is not, indeed, impeaching the honesty of the word *shop*, to apply it to these nondescript cabbage and potato stores. One side of the house through, from front to back, is all that is required to set-up an establishment of this kind; the front room being thrown open for a store, and the back room reserved for the "*grocer's*" family. Some there are even who have only one room for both these purposes. A potato-barrel, emptied through the day, will serve one of the smaller children for a bed, by putting a blanket in it; and the storekeeper sleeps under the counter with a withered cabbage for a pillow. All, or nearly all, the stores, of whatever class, in this district are for retail trade. The greater part of the extent of Sixth Avenue from Fourteenth to Eighteenth Street is thus occupied; so are Third and First Avenues, a part of

Fourth Avenue, and the greater part of Broadway. Drug-stores are found in about the usual proportion. There are a few quite extensive meat-markets, and a larger number of small ones. There is not a slaughter-house in the entire district.

Factories.—There are but few very extensive works of this order except the foundries, etc., on East River, and the gasworks. I have not yet been able to investigate the subject in any direction. As to their influence upon health, I have not learned that any stated forms of disease could be referred to works of any kind such as happen to be within the limits of the Eighteenth District. The employment of many of the operatives is such as to subject them to frequent and sudden changes of temperature. This is the case, for instance, with those who feed the furnaces in the gasworks. Running back and forth from the fierce heat of the fires to the coal-yard outside, and this even in the coldest weather, and then for a time inactive, one would suppose that a free perspiration thus repeatedly and violently checked would often give rise to serious disease. Whether any degree of habituation to that which, with one unaccustomed to the work, must surely cause severe and serious suffering, could be expected to protect men hardened to it from the consequences of such exposure, I do not know; I can only say that, in my dispensary practice, I am often called to visit the employés of the gasworks, and do not find them laid up with complaints ascribable to checked perspiration more frequently than other classes of laborers. The effect upon the human system of breathing, for hours together, and day after day, air heavily charged with carburetted hydrogen, is also an interesting question. It is a familiar fact, that but a small percentage of illuminating gas in the atmosphere is sufficient to destroy vegetable life; to such an extent that the ground all about a gasometer is as barren of trees and verdure as a desert of sand. These are subjects which I hope to be able to give attention to at some future time.

Prevailing Diseases.—The past summer and autumn have been remarkably healthy, and our city has enjoyed an unusual immunity from prevailing disease and epidemics. There has been considerable rubeola scattered through the district, and it still prevails to an extent; but it has been of an unusually mild type. In the eastern part of the district, however, typhus and typhoid fever have been prevalent for more than a year past. There is no section of the tenant-house district where isolated cases have not appeared. But there have been well-marked *centres* of the disease, places where it has remained from first to last, where its action has been well-nigh uninterrupted, and whence its infection has been carried in different directions. And not only has the disease been

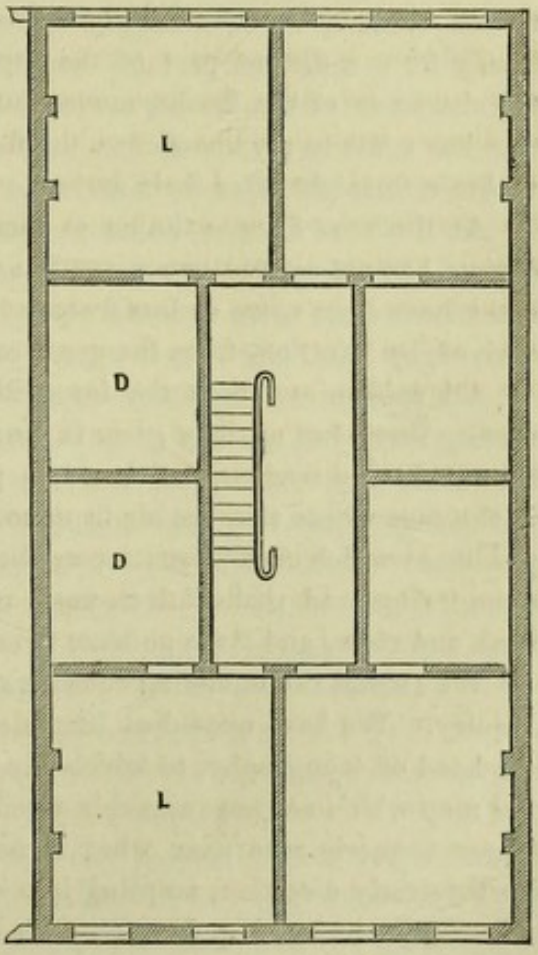
persistent in certain localities, but its poison has been remarkably concentrated there, and its results the most severe and fatal.

There is no one of these centres of disease—these "*fever-nests*"—*whence long ago the disease might not have been driven out*, if the houses of the poor were properly constructed, or if a suitable sanitary inspection were enforced and maintained by a police-power. And yet, notwithstanding the fearful totality of sickness and death, and the part they have played in keeping up the epidemic, *these houses stand to-day as they did a year ago*, infected and infecting, without one earnest endeavor on the part of the city authorities—except in one case, where a capricious and abortive effort was put forth for a few days—to stay the progress of the fever-poison. I have said that the disease might long since have been expelled from the localities where it was especially rife, and, consequently, a large number of human lives might have been saved. And not only this, but *the epidemic or spreading infection itself might have been arrested* at the same time; for, after the first important step had been taken of expelling the disease from its nidus, it would not have continued, except in scattered and occasional cases. I have known several instances where the disease was contracted, at one or other of these several *fever-nests*, by a person casually visiting there, thence carried by him to his own home, another tenant-house, more less distant, which had been free from the disease before; and in every case the fever was communicated to one or more persons about him, and a new *nidus* of disease has been in this way established. On the other hand, I have known several physicians who have contracted the disease in the same place and manner; yet in no case was it communicated to persons about them.

The places where these fevers have principally centred have been the following: On Fifteenth Street east of Avenue A; on Seventeenth Street between First Avenue and Avenue A; and on Eighteenth Street between First Avenue and Avenue A.

The number first mentioned includes a rear house also, as do several of the numbers in that neighborhood. Other houses near by have suffered more or less, but apparently only from the extension of the disease from its *habitat* at No. 256. Several cases occurring here have been laid before the association through "*special reports of pestilential diseases and insalubrious quarters*," to which we may now refer for all particulars as to the houses, their population, crowding, etc., etc. For details of the epidemic at No. 241 Eighteenth Street, reference may be had also to these reports, and also to *special cases* in the record-book. The locality mentioned second in order, No. 222 East Seventeenth Street, requires a more extended notice. In many respects it will serve as representative, and

illustrate the disease as found elsewhere; at the same time that these are intrinsic circumstances, both as regards the class and condition of the tenantry, and the extent, persistency, and virulence of the disease, which call for certain details. And when I use the term *disease* in this connection, I do not intend to commit myself to any theory; both typhus and typhoid fevers have existed here and elsewhere, and in the multitude of cases treated, and the relation of one class to the other, many important facts have been observed which bear upon the question of their generic identity or otherwise. But this is not the occasion, nor have I the space, to discuss this question; and I have said what I have that I might not be misunderstood in the use of the word *disease;* which is only for convenience, and with reference to the class to which both typhus and typhoid belong—Continued Fevers.



No. 222 East Seventeenth Street is one house of a block of houses, seventeen in number, which are of the same construction throughout. Each house has five stories, with four domiciles on each floor, for the accommodation of as many families. This diagram of the plan of these apartments for four families on each floor, is applicable to all of the 340 domiciles in that row of houses. Yet notwithstanding their close contiguity and identity of construction, the fever, as epidemic, seems to have been confined to No. 222 and its neighbor No. 220. There has hardly been a fortnight at a time during the past year when one or more cases of fever has not been in incubation or progress at the former number. It is impossible to ascertain with exactness how many cases of fever have occurred here; the class of people who live in this way are continually changing their residence, and it is often the case that only one or two families are remaining at a given house at the end of a year, out of twenty that occupied it at its beginning. Especially is this the case with a house which has the repute of the one we are consid-

ering. It has been ascertained that 35 cases of fever have been sent to the hospital from No. 222 since the 1st of January, 1864; and from 70 to 100, including the 35, have been attacked with this fever in this one house, during the year. About the middle of last summer, after I had repeatedly reported this house to the sanitary police as a *pest-house*, action was at last taken by an officer of that body, and the house was shut up—the occupants having first received suitable notice and having removed elsewhere. But within ten days of that time the doors were thrown open again, and, in many instances, the same old families came flocking back. So far as I could learn, no effort had been made to purify or disinfect the house during the short period of its closure; hardly a room was swept or a wall whitewashed. From that day to this its occupants have been allowed to remain there, unmolested by the police, and the fever has continued unabated. Occasionally an apartment becomes vacant, and a family from a distant part of the city, or from the country, ignorant of the character of the house, moves into it. In every case of this kind that has come to my knowledge, the fever has broken out in such a family within a fortnight after their arrival.

At the next door to the house mentioned above, viz., at No. 220, the disease has not existed so constantly as it has at No. 222; and although cases have been more or less frequent here, it would seem that they were derived, by infection, from the great centre of disease at No. 222.

All epidemics attack the immoral and degraded classes of the community first; but as they grow in power, as their poison becomes concentrated, they overleap all barriers physical and social, unless, indeed, in the case where they spring from conditions strictly local. As with the pestilence which Apollo sent upon the Greeks, the "feathered fates" fell upon "dogs and mules" first, until, rising in the scale, it attacked every rank and class, and "the goddess mourned her *heroes* slain."

We submit the following considerations meriting attention and further inquiry. We have quoted at length an observation of Gen. Viele, under the head of topography, to which the reader is referred. By looking at the map which accompanies this report,* it will be seen that a stream of water formerly rose near what is now Ninth Street, and, flowing in a northeasterly direction, emptied into the East River at the exact point where this house, No. 222, now stands. Why this locality should be more insalubrious than others along the bed of the former stream, I do not know, unless it be that the organic *debris*, collected by the stream and swept along by its current, would quite naturally be deposited in large accumulation at this place. Moreover, it is a fact well known of mala-

* See page 207.

rious regions in the South, that those marshes are the most pestilential where fresh and salt waters mingle.

The least that can be done—and something should be done right away—would be to remove all families from the house, to have it thoroughly cleansed and disinfected and kept vacant (not for a week or ten days but for) a sufficient length of time to ensure the entire eradication of all infection. If the ground itself on which the house is built be at fault, as there seems reason to apprehend it may be, then other and more radical measures will be necessary.

Remarks.—The most populous parts of our city are inhabited by those who are crowded for room. Grasping landlords let out to the families of the poor a small modicum of God's free air and sunlight, hardly sufficient for a single individual. Every expenditure of money, which the law does not force them to, is refused; and blinds half swung and ready to fall and crush with the first strong wind; doors long off their hinges, which open and shut by being taken up bodily and put out of or in the way; chimneys as apt to conduct the smoke into the room as out of it; stagnant, seething, overflowing privies, left uncleansed through the hot months of summer, though pestilence itself should breed from them; hydrants out of repair, and flooding sink and entry; stairs which shake and quiver with every step as you ascend them; and all this day after day, month after month, year in and year out, now a little better, and now worse again. *Miserere domus labentis!* As you pass the street or enter the outside door, if your eyes are not too much engaged, you are struck with a babel of sound. For 20 families live under this roof; there are, perhaps, 50 children of different ages here; a drunken fight, perhaps, is going on in one of the hall-ways, a quarrel between women quite likely; and cries, and shrieks, and oaths, and threats, the screams and shouts of uncounted children fill the air at once. For wherever the fault may be, one cannot expect that the most sober and industrious of our poor will live in such a place as this. Poverty alone can never condemn a man to such house as this is. A family may be ever so poor, and yet their door may be on its hinges, and their room be swept. What a place to live in! to be sick in! to die in! and yet a large part of our city population live and die in just this way. Do the intelligent and wealthy of our city know this? Do they, who are ever ready to assist in a good deed and to give to a good cause, who use as stewards the abundant wealth which God has given them—do such realize the want, and squalor, and immorality which exist within a stone's throw of their own happy homes?

Concentration is the great law of our modern civilization; never was it so active and so marked as now. Men leave their scattered homes in the

country and become near neighbors in town; houses go up side by side, and blocks of houses, and every inch of ground is economized. The boundaries of the city itself become extended, and every year shows an increase. Men prosper in this way; they advance their own interests and the interests of others. They have a broader field for usefulness; they have more abundant means to do good with. Even though they strive for their own selfish ends, though they seek only to bless themselves, they must bless others in spite of themselves; for they keep money in circulation and large classes of men employed. But what can be said of all this if the most populous parts of a city are the most degraded, the most immoral, the most thriftless and turbulent? Surely such a city is growing old and in its decay; or it is growing too fast in some of its parts, and such parts need attention. The welfare of every man is concerned in this; it does not appeal to the benevolent alone. Let the wealthy resident upon Fifth Avenue walk along Seventeenth Street from First Avenue to the East River, and examine the houses and look at their population as he pursues his way; and if he can read certain results in their causes, he will see enough to diminish his sense of security in his own house.

This condition of things appeals, therefore, to every man who loves his own life, who loves his family, and who would retain the wealth he has accumulated. It is his *interest* to do every thing he can to remedy it, if he never gave a dollar before to any charity, let him give of his influence and substance to maintain effectual agencies and works of sanitary improvement, and the prevention of popular diseases, and he will by such means maintain his own peace and security.

Remedial Measures.—The *evils* to which we have referred, *can be remedied.* The same concerted and persistent action, which has so long maintained them in an opposite direction, can overthrow them. No man has moral right to build a house, leaving out all the modern appliances and conveniences, even to ventilation, because they cost a little money, and then to crowd twenty families into it. Yet there are hundreds of such houses in our city, and many more are being built. No landlord has a right to refuse all the most obvious and necessary repairs to a house, until it is in such a state of ruin that nails and spikes must be driven in to keep it together. Nor has he a right to withhold all sanitary care and inspection until the contents of the vaults are more than even with the surface of the ground, and have become a constant nuisance and cause of disease and death. But it may be said the tenants can and should do all this for their own comfort, even if the landlord refuse. Yet, as a rule, they do not, and they will not. It is a question to what extent those compelled to live in this way are responsible for their own moral *status.* Most

truly says a modern writer: "Space, a free atmosphere, and cleanliness, have a great deal to do with the *possibilities* of human virtue." A few families of

> "——— rough, rug-headed kernes,
> Who live like venom, where no venom else,
> But only they, have privilege to live,"

will infect a whole neighborhood. The family of a better class, who live with only a thin partition separating them, and whose doors intercommunicate, will, in time, become more or less assimilated, at least their children will. Moreover, it is an accepted fact that to live for a long time deprived of pure air and sunlight, will not only depress a man physically and mentally, but will actually *demoralize* him. The atmosphere is precisely adapted, through its properties and constituents, to the wants of the beings designed to breathe it. Through its oxygen, and perhaps its ozone, it imparts life and energy and vigor to animals and plants. If certain equivalents of its oxygen be taken away, and carbonic acid be substituted, we have the opposite in different degrees, from loss of vigor, and courage, and spirits, to absolute death. There can be no question that peculiar effects follow long habituation to impure air; not so striking, perhaps, as those one experiences during its temporary respiration, but still none the less deplorable and formidable. It is like the subtle, insidious action of lead upon the human system, which is so slow in setting up its terrible power that the Ancients are said for that reason to have compared the metal to the god of time, and to have given it the name of Saturn. A man gradually loses ambition and hope; concern for the well-being of himself and his family, by slow degrees, lose their hold upon him. He becomes what cannot be better expressed than by the term *nil admirari*. Loss of physical vigor attends this corresponding condition of the mind, until at length lassitude and depression of spirits and constant *ennui* get such control over him that no power or effort of the will can shake them off. With this decline of energy and vigor, both of mind and body, is set up an instinctive yearning for something which will give a temporary respite to the dragging weariness of life. Hence we find that children even, who are brought up without the stimulating influence of pure air and sunlight, will learn to cry for tea and coffee before they learn to talk; and they will refuse the draught unless it be *strong*. One would hardly credit unless he has visited condiderably among the tenant-house population, how general this habit is among the youngest children. As they grow older, they acquire the appetite of their parents for alcoholic stimulants; and we need not go further to account for any extreme of immorality and want.

Many and the most important of the evils that have been described in this report cluster around that gigantic system of evils—the tenant-house system. Let no one refuse to assist the poor victims of these wrongs, because they do so little to help themselves—because they are idle, and dissolute, and indolent. We have labored to show that they are far from being so culpable for this, as might at first sight appear; and as they are at present, they are well-nigh helpless without the assistance of a strong arm from without. There is little hope of permanent good from temperance reform, among the laboring classes of the city, so long as they are obliged to live in tenant-houses constructed as at present. Men never will confine their appetite for drink to water so long as they cannot have a sufficiency of pure air. Of course any effort at reform, in this direction will be met with serious opposition. The same spirit is rife in our own day and in our city which prevailed in the time of our Saviour, when the whole country came out and begged Him to depart out of their coasts, because His gracious exercise of divine power had lost to them a *herd of swine;* unmindful that the same miracle had delivered a *human being* from the dominion of devils and restored him to his right mind. The same kind of men live in our city, if indeed they are not their direct posterity, as those who beat Paul and Silas in the market-place, because "they saw *the hope of their gains was gone!*"

Statistical Recapitulation.

Total number of	dwelling-houses,	1,733
(*a*) "	private residences,	1,233
(*b*) "	tenant-houses,	467
(*c*) "	frame houses,	17
(*d*) "	rear houses,	16
Number of	vacant lots,	91
"	public stables,	12
"	private "	53
"	church edifices,	14
"	school "	4
"	liquor stores, etc.,	77
"	stores, shops, etc.,	308

REPORT

OF THE

NINETEENTH SANITARY INSPECTION DISTRICT.

J. R. MANSFIELD, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Nineteenth District comprises the northern half of the Eighteenth Ward. It is bounded on the north by East Twenty-sixth Street, east by the East River, south by East Twentieth Street, and west by the Sixth Avenue.*

TOPOGRAPHY.—Before the grading of this district, about one-half consisted of a low marshy soil, containing a few small ponds, and a small stream of water. This stream crossed Twenty-sixth Street at or near Madison Avenue, passed down to Twentieth Street, where it crossed at a short distance below Fourth Avenue; but now no trace of the channel is visible, it having been filled with gravel or rubbish. The low margin of the East River has also been filled in, mostly by street sweepings, ashes, etc.; and many tenant-houses and places of business have been erected, and now stand upon the land composed of such material as street scavengers usually collect. This kind of soil is very objectionable, because the decay of vegetable matter is a source of disease; and although no case may have been directly traced to this cause, yet it has, no doubt, greatly assisted in its propagation.

DRAINAGE AND SEWERAGE.—The natural drainage of some parts of the eastern portion of this district is not good, the streets being so level that, after a heavy rain, water stands in pools for several days; and as garbage is being continually thrown upon the streets, and allowed to decay, the atmosphere becomes impregnated with poisonous exhalations, endangering the health and lives of the people inhabiting the surrounding buildings.

There are sewers in all the streets and avenues, but some of them are

poorly constructed. The effluvia from the opening of some of the sewers at the corners of the streets, is often exceedingly offensive; and, in one instance, in the cellar of a house on the east side of Avenue A, there was at the time of my visit more than a foot of water, which had escaped through the waste-pipe from the sinks above. I was informed that this cellar had not been dry for several months; and it was not only very offensive, but also a source of disease. There was a woman sick with typhoid fever at this time in the house. There are also four double tenant-houses, situated on Twenty-first Street below First Avenue, in which fever and other diseases are constantly found. Two of these buildings have no cellars, and water collects and stands in pools under them for weeks, and sometimes months, making them exceedingly damp and unhealthy. They are all poorly ventilated, dirty, and crowded with the lowest class of tenants, many of whom, in removing to other localities, carry with them diseases and causes of disease, liable to be communicated to persons occupying healthy dwellings.

Most of the streets are paved with cobbles, which form receptacles for vegetable matter that is constantly decomposing, and filling the air with a miasm which is very injurious to health.

Sickness and its Chief Causes among the Poor.—During the past year 6,783 new patients have applied to the Demilt Dispensary for treatment, from this district; of which 1,422 received treatment at their dwellings; making an average of over 565 cases taken sick in each month, or nearly 19 for each day. By far the greater part of these cases of sickness is due to overcrowding, faulty house drainage, and the neglect of precautions against infectious diseases and their local causes.

Tenant-Houses.—The number of squares in this district is 52, containing 1,703 houses; of these, 400 are tenant-houses, and although several others may not properly be classed with the private residences, nevertheless the manner in which the tenants and their landlords disregard the rules of health with respect to cleanliness, ventilation, and proper care of these buildings and their surroundings, has caused me to place them with the list of private dwellings. There are 64 rear buildings, which, with few exceptions, are tenant-houses. The sanitary condition of a majority of these buildings is very bad, inasmuch as they are so hemmed in by other buildings as to prevent a free circulation of air about them, and are usually crowded with a very low class of tenants, on account of the cheapness of the rent.

There are 39 vacant lots in this district, many of which are used for business purposes; and on some of them shanties have been built, in which horses and other animals are kept, and around which, from their peculiar

situation, the children of the neighborhood are in the habit of committing gross nuisances.

COURTS AND ALLEYS.—There are also 58 courts and alleys, 60 factories, 335 stores and markets, and 116 places where liquor is sold—not including grocery stores!

SLAUGHTER-PENS.—There are seven slaughter-houses in this district, and located east of Third Avenue; all of which are *very offensive*, and they are exceedingly filthy. If this source of annoyance and disease could be removed beyond the city limits, not only a great charity would be conferred upon the poor people residing in that neighborhood, but their health and sanitary condition would be greatly improved.

STABLES AND THEIR INFLUENCE.—Situated in this district are the well-known Bull's Head stables, occupying nearly all the south side, and a part of the north side of Twenty-fourth Street, between Lexington and Second Avenues. They are 35 in number, containing 1,000 stalls, occupied, at the time of my inspection, by 302 horses, which is a smaller number than is usual for them. These stables may have aggravated the diphtheria which has been prevalent in their vicinity for a few months past. One of these cases of diphtheria was that of a young and very able physician, which terminated fatally on the seventh day of his illness.

The whole number of stables in my district, including the Bull's Head stables, located in this district, is 176, containing, at the time of inspection, 613 horses. I was much surprised to learn that whenever any of these animals are sick, they are taken into *basement* stalls for treatment. This prevents them from receiving the better sanitary influences of the upper part of the building, which admits of a free circulation of air.

My attention has been called to the public school-house which is now building on Twenty-third Street between Second and Third Avenues. It is in conjunction with a row of stables, and in the immediate vicinity of two slaughter-houses; the cellar is also very damp, and emits a very disagreeable odor, the soil having been saturated with filthy material previous to its present use. Everywhere in the Nineteenth District is seen the necessity for the strong arm of an intelligent sanitary police, and more especially is there an urgent demand for practicable and effectual methods of improving the ventilation and domestic comfort of the ordinary tenant-houses that are already so numerous, and of thoroughly reforming the plans of all that may hereafter be erected.

REPORT

OF THE

TWENTIETH SANITARY INSPECTION DISTRICT.

E. H. JANES, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Twentieth District comprises the southern half of the Twentieth Ward, and is bounded north by Thirty-third Street, east by Sixth Avenue, south by Twenty-sixth Street, and west by the Hudson River.*

Remark.—In presenting this final report, I am aware that it is not in my power to astonish you with facts of so startling a nature as will be given by many of my colaborers in the more insalubrious districts; though I shall be able to show you that, with all its natural advantages for health and salubrity, one of the up-town wards is, in many respects, lamentably deficient in its sanitary regulations, through the combined influence of the cupidity of landlords, the ignorance and negligence of tenants, and the mismanagement and corruption of those in official positions. I am confident that there is no section of the city where the natural topography, climate, soil, and drainage, are more conducive to the health of the inhabitants than in this district; and I might add, that though I have found but few fever-nests, and not a very great amount of preventable disease, yet where these have occurred I have generally been able to trace them directly to the neglect of sanitary measures, either about the premises or in the neighborhood. I am, therefore, persuaded that if the proper sanitary regulations were instituted, or even if the existing laws were faithfully executed, much suffering might be avoided, and the bills of mortality greatly reduced. In reporting more fully upon my district, I shall first call your attention to its original topography, geology, soil, natural drainage, etc., and afterwards describe its present sanitary condition.

ORIGINAL TOPOGRAPHY.—The ground was originally dry and some-

what uneven, the principal inclination being to the south and west. The highest point was on Thirty-third Street, about midway between Eighth and Ninth Avenues, where the elevation was 55 feet above high water. On this line the ground gradually descended to Twenty-sixth Street, where the point of elevation was 30 feet. The surface also inclined to the east as far as Eighth Avenue, the line of which was, and still is, somewhat below the level of the avenues on either side. For this reason the main sewer is through Eighth Avenue, conducting the contents of the street sewers on either side into the main sewer in Twenty-third Street, and thence to the river. East of the Eighth Avenue the surface ascended as far as Sixth Avenue, where the elevation was about 42 feet. On Thirty-third Street near Tenth Avenue, there was also a rocky elevation of about 50 feet above high water. This was the general character of the surface, though there were other slight elevations and depressions in various portions of the district.

Geology.—The geological formation consists principally of micaceous gneiss, traversed occasionally by veins of granite and quartz; the former varying in width from ten to fifty feet, the latter from one to twelve inches, extremely tortuous, passing in every direction. The granite is rather coarse, though improving in quality the further north we go. In the northwestern portion of the district it is for a short distance the prevailing rock, and is of a fair quality for building purposes. Outcroppings of gneiss, or gneiss and granite, were originally seen on Sixth Avenue near Twenty-ninth Street, at the corner of Thirty-second Street and Seventh Avenue, on Twenty-sixth Street between Seventh and Eighth Avenues, a little north of Twenty-Seventh Street near Eighth Avenue, on Ninth Avenue between Twenty-ninth and Thirty-first Streets, throughout a considerable portion of the space bounded by Thirty-third Street, Ninth Avenue, Twenty-ninth Street, and Tenth Avenue, and on Thirty-third Street about midway between Ninth and Tenth Avenues. These outcroppings showed the prevailing strike to be either north and south, or northwest and southeast, the dip varying from 80 to 90 degrees. In one or two instances the strike inclined to the northeast, which is, I believe, the prevailing direction throughout the island. In some of the vacant and partially-excavated lots the gneiss appears to have undergone gradual disintegration, after having been exposed for a long time to the atmosphere; this is said to be in consequence of the very small proportion of quartz and feldspar, and the presence of sulphuret of iron, the decomposition of which yielding sulphate and oxide of iron, promotes the disintegration of the rock, and gives it the iron rust color so frequently seen. In addition to what has been already described, we have traces of horneblend gneiss,

pebbles of quartz, fragments of feldspar, and sandstone, all of which are occasionally seen in many of the vacant lots throughout the district.

The soil may be described as a somewhat dry sandy loam, slightly intermixed in some places with gravel. Near the corner of Thirtieth Street and Eighth Avenue commenced what was called Primrose Hill, and afterwards Strawberry Hill. Here was found gravel and sand in abundance, the latter of a fine quality, and was much used for building purposes. The only made or reclaimed ground in the district is about one-half of that portion west of Tenth Avenue, the original water-line extending across this section nearly in a diagonal direction, crossing Thirty-third Street at Eleventh Avenue. The material used for the purpose of "filling in" this portion of the district, I am told, comprises every variety of rubbish, the refuse from every branch of industry, street sweepings, ashes, garbage, etc. In grading the district, Eighth Avenue required elevating, for which good material was used taken from some of the higher elevations.

These primitive advantages of good natural drainage and of a comparatively undisturbed natural grading, considered in connection with all the geological peculiarities of the district, together constitute most important conditions that favor the natural salubrity of this locality. This fact is worthy of special remark, as there is every reason to believe that this district is destined speedily to become very densely populated by the laboring classes, and to be perpetually occupied by them. Man, not Nature, will be responsible for any general conditions of insalubrity here.

Water-Courses.—The principal natural water-course, taking its origin about two hundred feet east of Eighth Avenue, and about midway between Thirtieth and Thirty-first Streets, flowed southwest as far as the corner of Eighth Avenue and Twenty-sixth Street, thence west along Twenty-sixth Street as far as Ninth Avenue, thence northwest, crossing Twenty-seventh and Twenty-eighth Streets, emptying into the Hudson River at Twenty-ninth Street. A small shallow pond stood on Seventh Avenue, between Twenty-sixth and Twenty-seventh Streets, from which issued a small stream which, flowing west, emptied into the stream before mentioned, near what is now the corner of Twenty-seventh Street and Eighth Avenue. Two small streams, one from the north, the other from the south, united at Twenty-eighth Street about 200 feet east of Seventh Avenue, and flowing west, emptied into the stream first described, at a point about 75 feet north of Twenty-eighth Street, and 200 feet east of Eighth Avenue. These constituted the natural drainage of the district.

Present Topography.—In grading the streets and avenues, the original inequalities of surface have been generally followed, as the annexed table giving the present level at the various corners will show:

Table showing the present elevation above high-water in feet and inches at the different street corners in the Twentieth Sanitary District.

STREETS.	Sixth Av.	Seventh Av.	Eighth Av.	Ninth Av.	Tenth Av.	Eleventh Av.
West Thirty-Third,.....	42.4″	36.6″	30.8″	43.6″	29.7″	11.0″
" Thirty-Second,.....	41.6	35.6	29.4	42.0	19.6	11.10
" Thirty-First,.....	39.8	34.4	28.0	38.1	15.6	10.4
" Thirtieth,.....	37.11	33.0	26.8	34.0	15.0	9.9
" Twenty-Ninth,.....	41.6	31.10	25.4	28.1	13.3	8.11
" Twenty-Eighth,.....	38.11	30.1	24.4	22.0	12.3	8.1
" Twenty-Seventh,...	37.9	29.9	22.8	20.3	11.2	7.5
" Twenty-Sixth,.....	37.0	30.4	21.4	19.9	10.9	Not ascertained.

By consulting the above table, it will be seen that the most elevated corner is that of Ninth Avenue and Thirty-third Street (the highest point is some distance east of Ninth Avenue), and the lowest point probably the corner of Eleventh Avenue and Twenty-sixth Street. It will also be seen that above Twenty-eighth Street the grade of Eighth Avenue is lower than that of the adjacent avenues on either side. The water-courses that originally drained this district have been "filled in," and drainage effected by means of sewers.

From this brief account of the topography of the Twentieth District, its dry soil, its slightly uneven surface—the principal inclinations being such as to not only favor good natural drainage, but to secure also the full effects of the direct rays of the sun—it will be seen that, in a sanitary point of view, the effects of this topographical condition could have no other influence than one conducive to the public health; and not until the natural drainage was obstructed, and artificial drainage substituted, was the first step taken in the contrary direction.

STREETS AND AVENUES.—The direction of the avenues is said to be north and south, and that of the streets east and west. To speak more correctly, however, the avenues run north 33° 40′ east, the streets crossing at right angles. The former are 100, the latter 50 feet in width. The Sixth, Eighth, and Ninth Avenues, together with the portions of Thirty-first and Thirty-second Streets between Sixth and Seventh Avenues, are paved with the Belgian pavement, trap-rock being used for that purpore. This pavement is even, appears well laid, and wherever it is seen the streets are kept in a very fair condition. Throughout the remaining portions of the district the old-fashioned cobble-stone pavement is still in use, and full of irregularities of surface; some of the depressions being quite deep and several feet in extent, allowing the collection of pools of water at every rain, which instead of running off into the sewer, remain

to increase the humidity of the atmosphere by their gradual evaporation, and thus establish a predisposing cause of malarial fevers.

In many portions of the district the streets have the appearance of being seldom cleaned. In front of tenant-houses it is usual to see a pile of ashes, garbage, and other refuse matter which the tenants, in defiance of law and order, will persist in throwing into the street, there to remain until the arrival of the corporation cart, whose visits are generally "few and far between." We also see collections of refuse vegetable matter in front of nearly every green grocery in the district, either in the gutters or on the pavement.

GARBAGE.—The garbage-box is another nuisance which, although fully discussed at one of the meetings of Sanitary Inspectors, still deserves particular attention. There are between 50 and 60 of these in my district, not one of which can be regarded in any other light than one prejudicial to the sanitary interests of their respective localities. They are generally placed on the sidewalk, in front of tenant-houses, one often deemed sufficient for the accommodation of 20 or 30 families; and are either constantly full, or never completely emptied. Very few of these boxes are without some signs of demolition. Many have but three sides, many but two, and not one in the whole district has a cover. It is not unusual to see these boxes day by day receiving their accustomed load, until filled to their utmost capacity, when the gutter receives the surplus, which forms a temporary dam, allowing the collection and retention in the gutter of pools of water which become stagnant and filthy, impregnating the vicinity with the seeds of disease and death. When we remember that the garbage-box is made the receptacle for not only ashes and garbage proper, but all the dirt, rubbish, and refuse matter in the neighborhood, and often every species of filth, including dead animals and even human excrements, we must agree with one of the Inspectors who named it a "*Pandora's box, always open, always charged, and continually being supplied with the elements of putridity and disease.*" Indeed, what more appropriate name could be applied to such accumulating masses of filth allowed to remain from day to day, exposed to the vicissitudes of rain and sunshine, undergoing decomposition, and filling the atmosphere with their disgusting and poisonous effluvia? When an attempt is made to empty one of these boxes, which sometimes happens, the contents are hastily removed to the cart, during which process more or less is spilled from the shovel into the gutter, and there allowed to remain until the street-sweeper makes his appearance. No effort is made to thoroughly empty the boxes, consequently more or less of this foul matter adheres to the bottom and sides, sending off an odor more disgusting if possible than it was before

the mass had been disturbed. From this practice the boxes become so completely saturated with their contents that they become themselves a source of disease. I would here enter my protest against the use of these garbage-boxes, for they are not only wholly inadequate to the purpose for which they are intended, but wherever they are seen the streets are in a worse condition than where there are none.

It is hardly necessary to say that this condition of the streets and gutters is one calculated to exert a baneful influence upon the public health; and I might add that the most sickly portions of my district are those where this and similar nuisances are found.

The nature and condition of the street pavement is a subject of importance to the sanitarian, as bearing directly upon the salubrity or insalubrity of the city. Unquestionably whatever condition facilitates cleanliness, not only promotes our comfort and enjoyment, but is highly conducive to health; and, on the other hand, whatever opposes or retards this condition, is, to a certain extent, prejudicial. In the Russ or Belgian pavement, if the work be well done, we have an even surface, easily swept, and affording no lurking places for dirt to collect; while the uneven surface of the cobble pavement is swept with difficulty, the interstices between the stones affording ample protection for small collections of both animal and vegetable matter, which, in spite of the street-sweeper's gentle touches, remain, undergo decomposition, and mingle their foul emanations with the surrounding atmosphere. The practice of sprinkling the streets during the warm weather, thereby increasing the humidity of the atmosphere, and hastening the decomposition of whatever organic matter may remain on the pavement, is one directly at variance with the present status of sanitary science. If the streets are regularly and thoroughly swept, they will require no sprinkling; otherwise better suffer an occasional inconvenience from the dust, than to be constantly inhaling the miasm arising from this practice.

Sewerage.—Most of the avenues and streets of the district are sewered throughout their entire length. The sewers generally empty into the river below the level of tide-water. The sewer in Twenty-sixth street, however, is an exception to this, the outlet being a few inches above that point. This sewer terminates at Eleventh Avenue, some two or three hundred feet from the water at low tide. From the termination of the sewer to the river is an open ditch, which ends in a broad flat, exposed at low tide, and covered to a greater or less extent with the matter deposited from the sewer, from which more or less of a disagreeable odor arises.

It is an almost universal complaint that at times the noxious sewer-gases escape into the streets and houses, concerning the causes of which

distinguished sanitarians are not agreed, one believing it to be in consequence of a certain direction of the wind at low tide, while another is equally certain that it occurs only at high tide; the gas being displaced and driven into the streets and houses by the increased volume of water in the sewer. In his testimony before the "Metropolitan Sanitary Commission" of 1847, Mr. John Phillips, Chief Surveyor to the Westminster Court of Sewers, made the following statement in reply to a question concerning currents of air flowing either into or out of the sewers: "In going along the sewers, I have been always anxious to ascertain that fact. The light which I had in my hand I have placed immediately by the side of and into the house-drain, and I found almost invariably the flare carried into the mouths of the drain, so that there must have been direct currents from the sewers through the house-drains, and so into the houses themselves. I rarely met with any instances where there was not a current from the sewer into the house-drain, and also from the sewer through a number of gully drains into the streets." This could not have been from the presence of an increased volume of water in the sewer driving the gas into the streets and houses, as under such circumstances the examination could not have been easily made. On several occasions I have noticed this smell at low tide with a west wind, and others have noticed the same during the prevalence of east winds. Yet I am not prepared to say that it is never present during the period of high tide. In many instances this smell in the houses may be further accounted for by the character of the house-drains, which are often built of brick, one leading directly into the sewer, and being connected with several houses by means of side drains. These brick drains are often too large and of insufficient inclination to enable the water passing through them to effect their entire cleaning; and meeting the obstruction presented by the rough surfaces of the bottom and sides of the drain, much of the filth, instead of finding its way directly into the sewer, is retained along the course of the drains, and there remains undergoing decomposition, and giving off noxious effluvia and poisonous gases, which, if the waste-pipes are not securely trapped, will soon infect the atmosphere of the whole house. These sewer-gases not only escape through the waste-pipes, but the walls of the drains themselves are often so loosely constructed, or are so often out of repair, as to allow their escape independent of the waste-pipes. Instead of brick drains, if every house was furnished with a tubular drain of earthen or stone ware with glazed surfaces, as is now generally used in the better class of houses, this cause of the difficulty would be successfully removed; for the glazed surface of the tubular drain affording less resistance from friction, and its decreased capacity so concentrating the current of water

passing through it as to increase both its force and consequently its power to carry the filth with it, there is no possibility of its being choked up as is almost constantly the case with the larger brick drains; and therefore being always free from obstruction, there would be no decomposition of matter within them, and no foul emanations evolved.* However well the drainage may be constructed, there are still occasional complaints of the escape of sewer-gases into the houses, for which your inspectors were unable to account, until at one of our meetings a member of the council mentioned a fact in connection with his own house which I think is worth recording, viz.: that in emptying the bath-tub of a large quantity of water, the suction is sometimes sufficiently strong to empty the traps, leaving no impediment to the escape of this odor, which is remedied by again filling the traps.

The continual inhalation of an atmosphere impregnated with these sewer gases, viz., carbonic acid, sulphuretted hydrogen, ammonia, carburetted hydrogen, etc., is a well-known cause of enteric and typhoid diseases; and a most important desideratum is the best method by which we can effectually avoid these pestilential agencies. It does not come within the sphere of my duties to enter here upon a lengthy dissertation on the complex and unsettled question of the sewerage of large cities; but a brief allusion to their present mode of construction, with a single suggestion, would not be out of place. As at present constructed, the object of our street sewers seems to be to make our harbor the *cloaca magna* for the reception of all the debris and filth of the city, occasionally filling up our channels, to the annoyance and detriment of our shipping interests. There is also a constantly-increasing deposit along the bottom and sides of the sewer, generating noxious gases, and eventually diminishing the facilities of the sewer for drainage, and rendering necessary its occasional cleaning, which is attended with expense to the city, and great inconvenience to the workmen, who are compelled to labor in a stooping posture, with their backs continually exposed to the droppings from the top of the sewer.

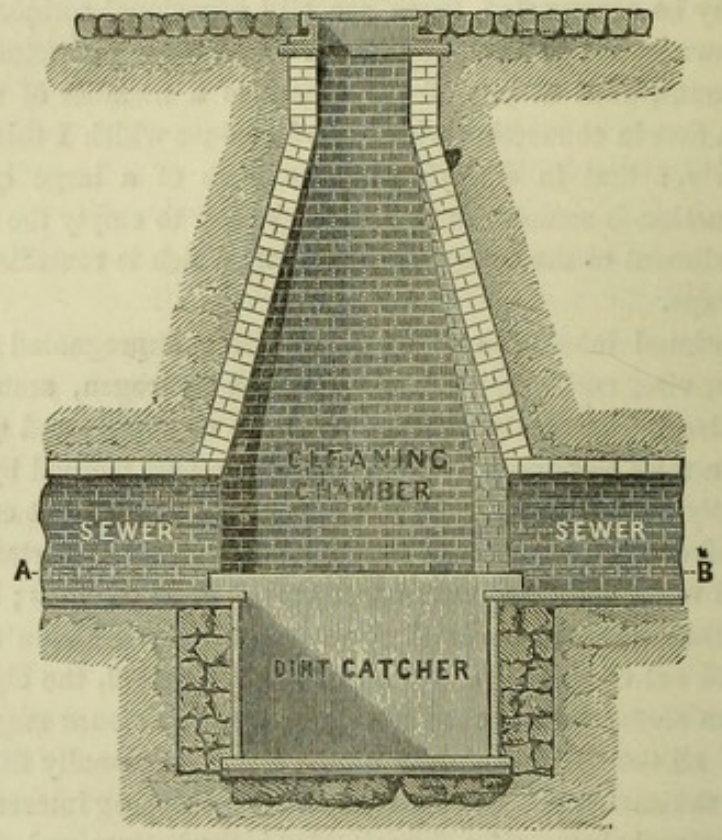
My attention has recently been called to a sewer in Twenty-seventh Street, built by James E. Serrell, Esq.,† of this city, civil engineer,

* The house in which I reside is a good illustration of this. Soon after moving into the house, nearly four years ago, it was discovered that there existed some defect in the drainage, and upon inspection it was found that the house-drain was a very poorly constructed one of brick, choked up, and sending an unpleasant odor through the house. This was thoroughly cleaned and repaired, but after a few weeks the same unpleasant odor returned and again invaded the whole house; and not until this brick drain was removed and a tubular one of tile substituted, were we relieved of this offensive nuisance.

† To this gentlemen, to whose maps and charts I have had free access, I am indebted for my information concerning the original topography of the district.

and one of our city surveyors, which not only obviates this difficulty, but possesses other advantages not claimed for any system of sewerage with which I am acquainted. The improvement consists in deep vaults called "dirt-catchers," along the course of the sewer, at such distances apart,

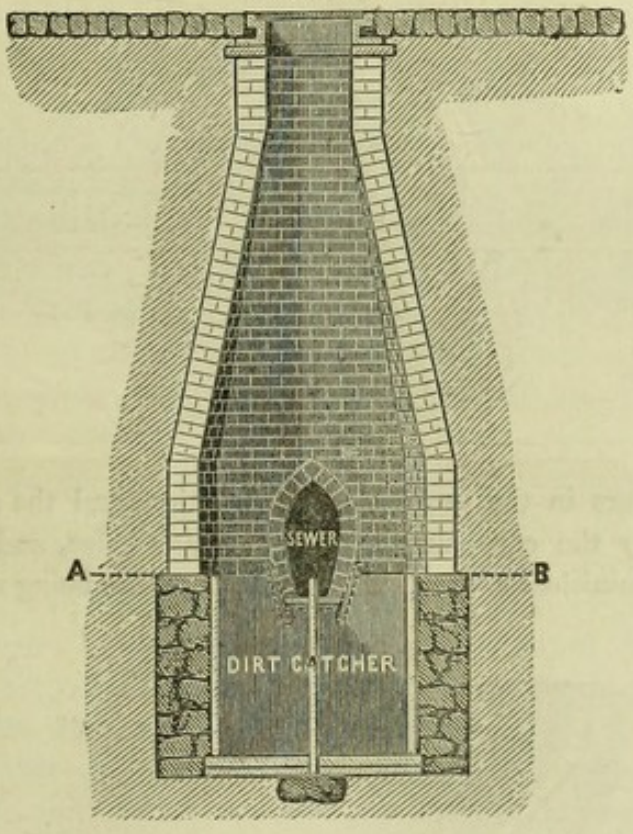
Longitudinal Section.



and of such a depth, as to secure the collection and retention of the night soil and solid matter washed from the street into the sewer. This solid material, sinking to the bottom of the vault, and consequently under water, will emit little or none of the offensive effluvium so repulsive to our senses. By constructing these "dirt-catchers" at proper distances apart, nearly all of the matter otherwise carried into the river, or deposited along the bottom and sides of the sewer, will be collected, for what passes over one vault the force of the current will suffice to carry to the next, leaving the sewer always clean and unobstructed. When the vaults are full they will of course require to be cleaned; and for this purpose they are built in two compartments, by means of a longitudinal partition, and so arranged that the whole current may, by means of a small temporary dam, be made to pass either compartment, while the other is being cleaned. This temporary dam is afterwards removed to the other side of the sewer, and the current turned through the side of the vault just cleaned, while the re-

maining one is undergoing the same process. This arrangement gives the men full liberty to work at the best advantage, while the restrained and uneasy position which they are compelled to assume while at work in the ordinary sewer, enables them to accomplish but very little in a

Cross-Section.

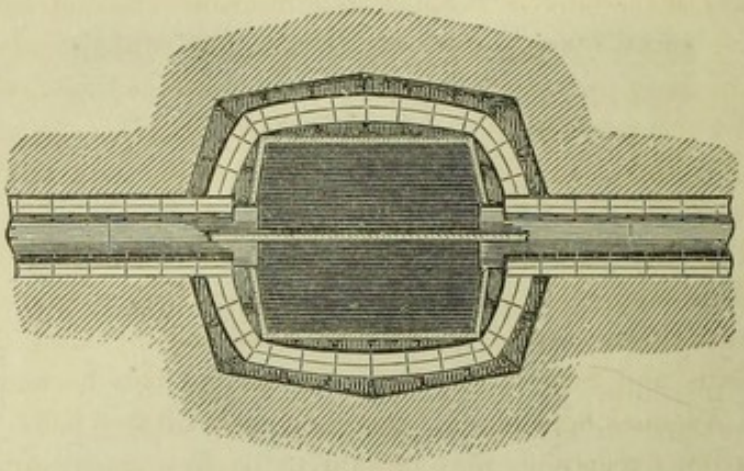


given time. There are also four of these "dirt-catchers" in the Fortieth Street sewer, between Ninth and Tenth Avenues, of sufficient capacity to contain 100 loads each, and which have been cleaned twice since their construction, at an expense of only from five to ten per cent. of what it would cost to remove the same bulk of material from the ordinary sewer. In addition to the advantage gained in cleaning, we not only relieve our city in a great measure from the offensive sewer smell, prevent an accumulation of filth in the rivers around our wharves and piers, but we are enabled to save to the country a vast amount of fertilizing material hitherto regarded by agricultural writers as the great waste of cities.

These vaults in the Fortieth Street sewer are 200 feet apart, and receive all the mud and dirt which would be otherwise washed into the river, or adhere to the bottom and sides of the sewer. It would at first view seem an expensive undertaking to construct these vaults in all the sewers throughout the city; but, in view of the great relief to our rivers,

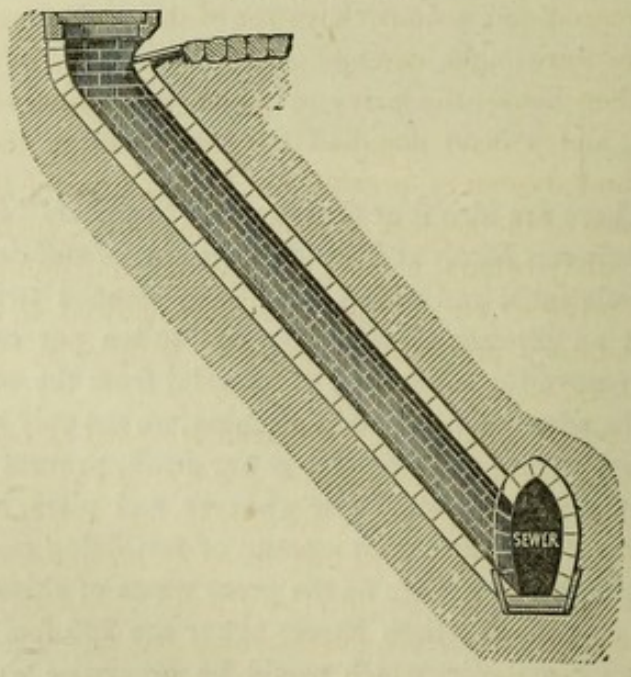
the increased facilities for cleaning, the suppression of the sewer gases, and the immense saving to our agricultural districts, this expense would soon be cancelled even as regards the old sewers; whereas they could be

Plan at line A B.



applied to sewers in the process of construction, and the additional expense saved by the construction of fewer man-holes, and building the sewers of a diminished area, their present large size being necessary only

Culvert or Sluice.



for the purpose of allowing workmen to enter when cleansing is ordered, which, with the improvement suggested, would be wholly unnecessary. As with the house-drains, so with the sewers, the current of water con-

centrated by the diminished size of the conduit flows with greater force, and consequently with a greater cleansing power; and instead of being deposited along the bottom and sides of a large sewer, from whence these offensive gases are evolved, this foul material is forced along by the greater power of the current through its diminished channel into the vault into which it sinks, leaving the sewer clean, and consequently free from these noxious gases; for it should be remembered that these gases are not generated by the passage of this matter through the sewer, but by its being retained there, and undergoing decomposition with an insufficient amount of water to cover it.

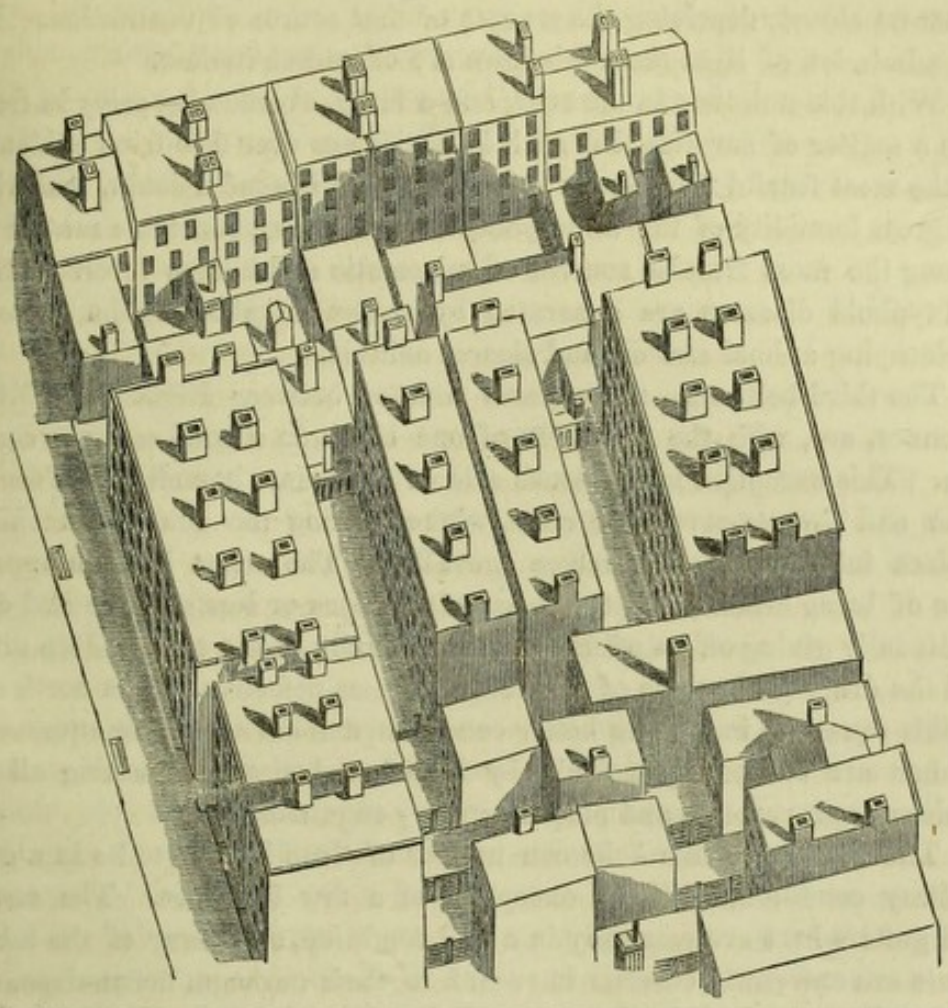
Squares.—My district comprises 35 squares, not including the piers and their surroundings; and for the purpose of systematic inspection they have been classed in belts, the first belt including the squares between Sixth and Seventh Avenues, the second belt between Seventh and Eighth Avenues, and so on; there being in all five belts. The first belt, with a few exceptions, may be said to be in a good sanitary condition, there being but few crowded tenements and few rear houses. The streets are also generally in a rather better condition than in many other portions of the district. The inclination of surface is south and west, drainage good, and no made ground. There are, however, a few localities where causes of insalubrity exist, and the effects of these causes are seen in the increased and serious character of the prevailing sickness. In one house there were eight cases of scarlet fever, five of which proved fatal. In another house, the privy of which was found to be in a very filthy condition, and a dead dog had lain for weeks in the damp cellar, typhoid fever and dysentery prevailed. Both of these houses showed abundant evidence of the neglect of sanitary measures, such as bad drainage, damp and dirty cellars, neglect of personal and domiciliary cleanliness, overfilled privies,* etc. Other localities showed similar evidences of a lack of sanitary precautions, together with more or less of the characteristic sickness.

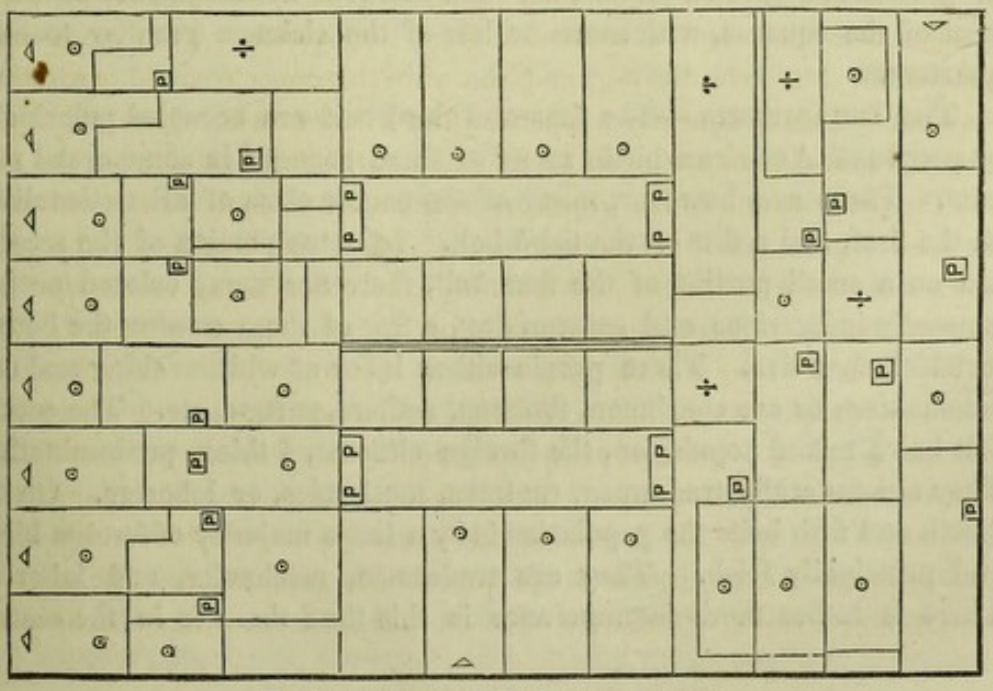
The second belt of squares in my district I regard as being in a mixed sanitary condition; some of the squares good, others very bad. The surface inclines to the south and west; the streets are not in as good condition as those of the preceding belt, and in some instances the drainage is more defective. There are on this belt more crowded tenements and more rear houses; the latter are often so near together that the rear walls of each approach to within a few inches of each other.

* According to our present sanitary laws, a privy is full when its contents reach to within two feet of the floor, and must then be cleaned; hence I have applied the term overfilled to those privies in which the contents come to above this point.

Massing of Tenements.—The following is a fair illustration of the manner in which building lots are often crowded: A row of four or five-story brick tenements stands facing the street, twenty or twenty-five feet in the rear of which stands a similar row, on the rear portion of the same lots on which the front houses stand. In the rear of these rear houses, at a distance varying from a few inches to two feet, stand the corresponding rear houses of the next street, and twenty or twenty-five feet in front of these last mentioned stands the corresponding row of front houses. In this manner twenty houses, each twenty feet wide, and as high as it pleases the owner to rear them, may stand on a space of less than 20,000 square feet; and allowing each front house to contain eight, and each rear house four families (a moderate estimate), we have to each family about 164 square feet of ground. The wood-cut on the next page presents a bird's-eye view and ground-plan of the locality here described. It is the western section of a newly built-up square, not far from the great hotels on Fifth Avenue and Broadway, and will almost inevitably become a fever-nest.

This system of building a large number of houses on a small area of ground is frequently seen on this belt of squares, and with it are found what seem to be inseparable evils. The privy, from necessity, is located in close proximity to the rear house, either immediately in front of a window, or just at the entrance to the cellar. It is in some instances connected with the street sewer by means of a drain, which often becomes obstructed by rubbish or garbage thrown into the vault by the tenants. In other instances there is no such connection, and consequently the privy is soon overfilled, and a source of great annoyance. They sometimes become filled to overflowing, and the yard becomes covered with their contents. This frequently happens after a hard rain, where the spout from the house is so arranged as to conduct the rain-water from the roof into the privy vault, which overflows, spreading the contents not only over the yard, but in some instances into the cellar, the bottom of which becomes covered with this semi-liquid filth. In other instances the seat and floor of the privy become soiled and filthy to such an extent that they are wholly unfit for use, and the poor tenants are compelled to resort to their chamber utensils, the contents of which are emptied into the garbage-box, into the already overfilled privy, or into the narrow space between the rear walls of the two houses. This space is so narrow in a majority of instances as to render it impossible for a man to pass between the walls, often becomes the receptacle for all the rubbish, garbage, and filth of every description, creating an odor so offensive that it is necessary to keep the





The Ground-Plan with Explanatory Symbols.

windows closed, depriving the tenants of that source of ventilation. For the admission of light these windows are of course useless.

With this nuisance in the rear, and a filthy, overflowing privy in front, it is a matter of surprise that such localities are ever free from epidemics of the most fearful nature; for it is established beyond a doubt, that while too great humidity of the atmosphere and decaying vegetable matter are among the most fruitful sources of miasmatic and bilious fevers, enteric and typhoid diseases are generated by human exhalations, the presence of decaying animal matter, and cloacal effluvia.

The third belt, viz., the squares situated between Eighth and Ninth Avenues, are, with the exception of one block, in a good sanitary condition. This exception is the south side of the square bounded by Twenty-sixth and Twenty-seventh Streets, where, during the summer, measles, cholera infantum, and diarrhœa prevailed. The street had the appearance of being seldom swept, but contained more or less garbage and dirt, continually giving off an offensive smell. Many of the cellars were dirty, and the drainage in some of the tenant-houses defective. The north side of this square is in a much better condition, and the remaining squares on the belt are occupied principally by first-class houses, containing all the modern improvements and proper sanitary regulations.

The remaining two belts can neither of them be said to be in a good sanitary condition, with the exception of a few localities. The streets and gutters here are generally in a bad condition, and many of the inhabitants are extremely careless in regard to their garbage, house-slops, etc. Dirty cellars, neglected privies, crowded and rear tenements, are found on most of the squares, with more or less of the sickness peculiar to such quarters.

The Inhabitants.—The first and third belt are occupied principally by people of American birth, many of them engaged in commercial pursuits. There are, however, many of the poorer class of all nationalities on the first, and a few on the third belt. In some portion of the second, and on a small portion of the first belt, there are many colored people, generally industrious and enterprising, a few of them owning the houses in which they live. These people either labor at whitewashing and carpet-shaking, or are coachmen, footmen, waiters, porters, etc. The second belt has a mixed population, the foreign element, I think, predominating. They are generally tradesmen, cartmen, mechanics, or laborers. On the fourth and fifth belts the population is by a large majority of foreign birth, and principally Irish. They are tradesmen, mechanics, and laborers. There is rather more intemperance in this than there is in the eastern

portion of the district, though there are no localities in the district very notorious for the prevalence of vice and immorality.

BUILDINGS.—Owing to the important changes continually occurring in some portions of our city many of our statistics can only be approximative. The following, however, is as nearly correct an account as I can furnish of the buildings in my district:

Whole number of houses,	2,124
Tenant-houses,	1,206
Rear houses,	231
Stores,	448
Drinking shops,	130
Factories,	25
Churches,	11
Public schools,	2
Vacant lots,	28

About one-seventh of the houses in the district are what are called first-class houses, built either of stone or brick, from three to four stories in height, and containing all the "modern improvements." Most of these houses are of modern date, having been erected within the last ten or fifteen years; they are commodious, well ventilated, and in good sanitary condition. The water is supplied to every floor, especially to the kitchen and sleeping-rooms, and to each hydrant are pipes for the free discharge of waste water. A few of these houses are warmed with stoves or grates, but most of them are supplied with furnace-heaters. Gas is used for lighting. The bath-room, containing also a water-closet, is usually located at the rear end of the hall, either on the second or third floor, and in some houses there is also a water-closet in the basement. The waste-pipes of the house, when properly trapped and well constructed, afford good drainage, and prevent the escape into the house of any offensive smell from the sewer. A majority of the houses in my district are what are called tenant-houses; and I believe that by far the most fruitful source of disease and that which contributes most largely to the bills of mortality, especially infant mortality, is the present system of overcrowding this class of houses. The apartments allotted to each family in the ordinary tenant-house usually consist of one main room, and one or perhaps two small bedrooms. The main room, used for a parlor, sitting-room, kitchen, and laundry, is ventilated by means of two windows and a door leading into the hall. There is also a fireplace, which in winter is usually closed, the room being warmed with a stove. The ceilings vary somewhat in height,

but 8 feet is, I think, the average. In the rear of the main room is the bedroom, about 8 or 10 feet square, often less, dark, and often without any means of ventilation except the door leading to the main room, which reduces both rooms to one common atmosphere. In a few of the best tenant-houses there is a small window from the bedroom to the hall which affords a better ventilation. In some of them there is, in addition to the dark bedroom, a small hall bedroom with a good window affording both light and ventilation. In what is called a single tenant-house we have accommodations of this kind for two families on each floor, the bedrooms occupying the space between the two main rooms. In the double tenant-house we have the same accommodations for four families on a floor, the hall and stairway being in the centre, and apartments for two families on each side.

Table showing the number of cubic feet of air-space to each individual in in tenant-houses.

Number of tenant-houses in which there are less than 300 cubic feet of air to each individual, .	2
" 400 " " "	26
" 500 " " "	184
" 800 " " "	788
" in which there are 1,000 or more " .	118
The greatest number of cubic feet to an individual in any one tenant-house, ...	2,280
The least, ...	252

One thousand cubic feet of air is now deemed requisite to each individual, yet a mere glance at the above table will show how small a proportion of tenements in this district furnish to their inmates the required amount of that most essential life-sustaining principle. In one of these pent-up apartments live, eat, sleep, cook, and wash, a family of perhaps five or six individuals. At night both rooms are occupied, for what is a settee or a lounge during the day is easily transformed into a bed, or perhaps a straw mattrass on the floor forms the sleeping accommodations of some portion of the family. When called to one of these tenements in the night time, in a professional capacity, the medical man is arrested at the entrance of the apartment by an atmosphere loaded with carbonic acid gas from the lungs, and the various exhalations from the bodies of those crowded within. On a mattrass in one corner of the main room slumber two or three children in blissful ignorance of the violation of any law of sanitary science; the lounge may be occupied by the maiden aunt, or a

boarder, or some adult member of the family; while in the miserable, dark, unventilated hole called a bedroom, is the patient surrounded by two or three officious neighbors doing their utmost to poison what little air might otherwise reach the sufferer. Almost before learning the nature of his visit, the physician instinctively raises a window, and what often proves the most powerful remedial agent at his command is freely admitted. This is no exaggeration, for it has been my fortune, and doubtless that of many others, to be called in the night for a distance of several blocks to find the only professional services actually needed to be the opening of a window, and the admission of an adequate supply of that pure air which our all-wise Creator intended should be enjoyed by all of his creatures freely and without stint.

Water-Supply and House Drainage.—Concerning the water-supply and house drainage, there is in most of the tenant-houses room for improvement. In the better class of tenements the supply is ample, there being usually at least one hydrant to each floor, sometimes one to each family. In the former case it is located in the hall and resorted to by each family on the floor, in the latter case it is located in the main room, or pantry, if there be one, or sometimes in the bedroom. It is not unusual while investigating the sanitary condition of a tenement, to hear complaints of the imperfect construction of the Croton-pipes, a leak in one, or some obstruction in another, often demanding the plumber's attention. The waste-pipe is also a frequent source of annoyance, not only from obstruction and leakage, but there being one continuous pipe from the top to the bottom of the house forming connections at each floor, when the families in the lower apartments empty their house-slops, the water in obedience to the law of gravitation descends, while the vapor, obeying an equally imperative law, ascends through the pipes, escaping into the apartments above, disseminating a most foul and disagreeable, not to say unhealthy odor. I have been in houses where the water was kept running during certain portions of the day to avoid the necessity of inhaling this disagreeable vapor, when by having the waste-pipes properly trapped, this annoyance could be effectually avoided, and the tenants relieved not only of a very unpleasant odor, but of one of the many sources of insalubrity so common in tenant-houses. In many instances the cellar to the tenant-house is made the receptacle for all the rubbish apparently accumulated for years, and consequently many of them are so dirty that they are never used by the tenants for any purpose whatever. It seems to be no one's business to remove this dirt, the landlord claiming that it is the fault of the tenants that the nuisance exists, and the tenants declaring their innocence, and blaming their predecessors.

In many tenant-houses the first floor is occupied as a store, in which are sold cheap groceries, stale vegetables, very strong butter, a fluid bearing some resemblance to milk, and too often those mysterious compounds known as "new imported wines and liquors." Beer is also sold to a greater extent than any other commodity, most of the tenants deeming it indispensable to their comfort.

The rear tenements are found to be in a much more repulsive condition, and in every respect more insalubrious than those in front. In order to reach one of these houses we pass through a narrow alley, the centre or one side of which is in many instances used as a surface-drain for the purpose of carrying off the house-slops and waste-water which, to the annoyance of the passers-by, must cross the sidewalk in order to reach the street gutter. This alley passes under the front house, a few steps to the rear of which stands the object of our search surrounded on all sides by buildings of its own height, and consequently not only shut out from view of the street but from every current of air which might dilute and disperse the noxious effluvia arising from the overfilled privy, usually in close proximity to the entrance of the house, and for a greater part of the day from that very essential life-sustaining element, the light of the sun, without which the most vigorous specimens of either animal or vegetable life will fade and die. The water-supply to these houses is generally limited to one hydrant situated in the yard, or at the entrance of the alley. There is, in some instances, a drain leading from the hydrant into the privy-vault, where the latter is connected with the street sewer, for the purpose of conducting thither the waste water that it may effect the cleansing of the privy. This, however, it often fails to do, especially if the drain from the vaults be obstructed, the result of which is often the overflowing of the vault. I have visited houses where it was impossible to pass through the yard, except by the aid of stepping-stones, without getting the feet soiled from this very source. From this cause a sickening effluvium is constantly arising, pervading the whole house, and often extending to the street. Under circumstances like these I have found cases of typhoid fever, dysentery, &c.

The apartments of these houses usually consist of a room and bedroom to each family. In some instances there are two bedrooms, but in most of the rear houses but one, sometimes containing two beds separated by a curtain. The bedroom, always in the rear of the main room, usually contains a small window; but, as before stated, in consequence of its proximity to the walls of the corresponding rear building of the adjoining lot, which may be a house, a stable, or whatever the owner may choose to build, this window is of no use for the admission of light, and for

reasons before stated can rarely be used for the purpose of ventilation. In a majority of rear tenements, therefore, the apartments are dirty, dark, and uninviting, often reeking with filth, the walls wholly innocent of whitewash, and the atmosphere impregnated with the disagreeable odor so peculiar to tenant-houses. In some the sun never shines, and the apartments are so dark that unless seated near the window, it is impossible to read ordinary type; and yet the inspector often hears the hackneyed expression, "We have no sickness, thank God," uttered by those whose sunken eyes, pale cheeks, and colorless lips speak more eloquently than words of the anæmic condition inevitably resulting from the absence of pure, fresh air, and the genial light of the sun. Some of these houses are built with the stairs on the outside leading to a portico to each story, which, by projecting over the windows, excludes the greater portion of what little sunshine might otherwise enter the apartment. The cellars of these houses (those that have cellars) are generally in a more filthy condition than those in front, being not only loaded with the accumulated masses of dirt, garbage, rubbish, etc., but often substituted for the privies, the latter being unapproachable, either from neglect of cleanliness or the malicious behavior of some of the tenants, who, in many instances, seem to wholly disregard personal cleanliness, if not the very first principles of decency, their general appearance and actions corresponding with the condition of their wretched abodes. This is particularly the case with their clothing, especially their bed-clothing, which has the appearance of rarely being washed or changed, and is consequently saturated with the secretions and exhalations from the bodies of their occupants. This indifference to personal and domiciliary cleanliness is doubtless acquired from a long familiarity with their loathsome surroundings, wholly at variance with all moral or social improvement, as well as the first principles of hygienic science. The food of these people consists principally of the cheap meats and groceries purchased in the immediate neighborhood, and the half-wilted vegetables furnished by the street-hawkers, washed down by generous potations of stale beer. Very poor tea, and a miserable preparation called rye coffee, are also used to a considerable extent. The drinking shops in front of these houses are in too many instances patronized by both sexes, another illustration of the demoralizing effects of this mode of living.

Although the past season has been healthy so far as my district is concerned, yet I can unhesitatingly say that by far the greater amount of preventable disease has been found in locations similar to those just described, showing the most conclusive illustrations of the relation of cause to effect. At an early period of our organization a member of the Council

suggested the question of acclimitation as influencing to some extent the direct effects of these various causes of insalubrity. I regarded the idea as an important one, ever keeping it in view, and have on several occasions noticed that families suffering the most from diseases peculiar to the season, were comparatively new-comers, and but for a short time exposed to these morbific influences; while the older residents, though enjoying to some extent an apparent immunity from these characteristic diseases, often exhibited a degree of both mental and physical degeneration but poorly calculated to resist the force of epidemic influences, or the actual presence of disease. The children are strumous, and fall easy victims to whooping cough, measles, scarlet fever, small-pox, etc. I have not been able to ascertain the extent to which factories, stables, and slaughter-houses affect the public health, though in regard to the latter I believe that in my district they are in as good condition as can be expected of such "institutions." In only one instance have I heard complaints of negligence in the disposal of offal, and the consequent stench arising therefrom. But however well they may be managed, there is at least in connection with them much that is offensive, and I believe injurious to the health of large cities. In regard to factories, I believe their average condition in respect to cleanliness and ventilation to be far more favorable both to comfort and health than the average condition of crowded tenements.

Vacant Lots.—Most of the vacant lots in the district are in a fair sanitary condition, though quite a number are in a very bad condition, containing large quantities of decaying vegetable matter thrown there from time to time by the inhabitants of the neighboring tenant-houses. There are two lots of this character in Thirty-second Street near Tenth Avenue, each containing an abundance of every thing that is filthy, which add materially to the disgusting character of the streets. Many of these lots contain rubbish consisting principally of refuse matter from the various branches of industry, ashes, garbage, and a variety of worthless material of every description. A vacant lot in Thirtieth Street near Sixth Avenue is surrounded by small wooden sheds used as stables, and the lot itself contains every species of rubbish, consisting of broken carts, milk-wagons, old wheels, and a variety of articles of this description too numerous to mention. This locality enjoys the classic name of "Bummers' Retreat," so called from the fact that certain members of our democracy, after having imbibed somewhat freely at the shrine of Bacchus, may "turn in," and beneath the shelter of some friendly cart, or some vacant stable, sleep away the effects of their recent potations.

Cellar-Population.—The cellar-population in the Twentieth District is not so large, neither is their condition so bad as in many other

portions of the city. I have, by the kindness of Captain Lord of the Sanitary Company M. P., obtained the amount of the cellar-population of all the cross streets in the district, which comprises nearly all, as on the avenues there are scarcely any that can be classed as such. We occasionally on the evenues find a tailor or shoemaker occupying the front portion of a basement as his workshop, the rear portion being occupied by his little family, which comprises about all the cellar-population on the avenues.

Statement of Cellar-Population on the Cross Streets.

Number of houses containing cellar-population,	96
Whole number of individuals constituting "	567
Minimum amount of air-space to an individual,	280
Number of houses containing less than 500 cubic ft. to an individual,	12
" " " " 700 " "	46
" " " " 900 " "	68
" " containing 1,000 " or over "	22
Number of basements containing only two persons each,	8
" " " over nine "	8
The largest number of persons in one basement,	14

In calculating the number of cubic feet of air-space to an individual in a tenant-house, the width and depth of the house is multiplied by the height, and that divided by the number of people in the house. So with the cellar-population, the width and depth of the house multiplied by the height of the basement-ceiling gives what is called the number of cubic feet of air-space which includes the hall, stairway, partitions, &c. It will be seen, therefore, that these figures do not represent a correct estimate of the actual number of cubic feet of breathing air allotted to each individual, for when we make allowance for the furniture contained in these apartments we must make a still further reduction and reduce the actual amount of air to a figure considerably below that of the present estimate. The amount of cellar-population in the city, Captain Lord informs me, has considerably diminished; and as far as the Twentieth District is concerned, they are in many instances, especially those on the sunny side of the street, more comfortable than the occupants of the rear tenement. There are, however, many examples showing that whatever has heretofore been said of dark, damp, and cheerless abodes of our cellar-population, is no exaggeration. But I shall leave any further remarks on this subject to those in whose districts the evil is found to exist in a much greater degree than in the Twentieth Ward.

Improvements.—No instance of any improvement made through the

influence of the health department officials has come to my knowledge since commencing this inspection. To show, however, the facility with which many of these evils are remedied. I would add that in many instances my visits have been followed with this desired result without the necessity for a complaint; the landlords sometimes going so far as to issue printed notices to their tenants containing certain requisitions, and threatening ejectment as a penalty for their non-compliance. It has ever been my aim to make as few complaints as possible, and to effect desired changes in a peaceable manner. The experience which I have had in this respect has convinced me that, if invested with legal authority, your inspectors could have easily instituted a thorough sanitary reform throughout the city; and that the present health wardens have no excuse whatever for allowing so many nuisances to exist, and manifesting so little interest for the sanitary condition of their respective wards. I am more than ever convinced that this office of health warden is a mere sinecure, generally awarded to political favorites who understand little and care less about the duties incumbent upon them, and whose official occupation, aside from electioneering, seems to be to draw and spend their salaries. As far as my own ward is concerned, I never hear of this functionary in his official capacity, although there is enough to occupy his attention, and test his capacity as a health officer. If instead of filling this important office with men ignorant of the first principles of sanitary science, a competent medical man were appointed to each ward, with one of Captain Lord's efficient men as an assistant, more would be accomplished in a single month toward promoting the real sanitary interests of the city, than is ever done by these misnamed guardians of the public health; and I believe that not until these sacred trusts are confided to competent men, will the important duties of health warden ever be discharged in a conscientious and intelligent manner.

Diseases.—The principal diseases met with during the past season have been typhoid fever, measles, scarlet fever, diarrhœa, cholera infantum, and dysentery. But few cases of small-pox have come to my knowledge within the district.* I have found but few houses with more than one or two cases of sickness at one time, most of them being isolated cases in localities where causes of insalubrity were seen; and wherever a house has borne to any extent the appearance of a fever-nest or pest-house, these causes have existed in proportion.

It might be asked why it is that no greater amount of sickness is found in places where there are so many apparent sources of insalubrity. It is a fact in medical science, better known than understood, that to certain conditions of the atmosphere are due the characteristic features of

* Since this Report was written Small-pox has become fearfully prevalent.

the prevailing disease of any season. Precisely what this atmospheric agency is that gives us an epidemic of typhoid fever at one time, and small-pox or cholera at another, we are ignorant; but the fact that it does exist, and the knowledge of that fact, should suffice to induce us to guard with jealous care our sanitary interests, and leave behind no magazine to explode at the slightest exposure to these meteorological changes. During the past season we have been unusually free from epidemic influences, and these germs of disease have been permitted to remain latent in many places, awaiting only the appropriate stimulus to send them forth to the successful and speedy execution of their destructive mission. Had an epidemic of cholera or dysentery appeared in these localities during the past summer, its ravages would have been fearful, as the well-known history of epidemics can abundantly testify; and even sporadic cases of measles and scarlet fever prove fatal in a much greater proportion in these localities than in the more salubrious districts. A very large majority of cases of cholera infantum occurring in rear tenements from which are excluded the genial rays of sunshine, and where the atmosphere is loaded with the emanations from overflowing privies, filthy cellars, and undrained cesspools, prove rapidly fatal in spite of the most judicious medical treatment; whereas, when the disease appears under more favorable circumstances, a fair proportion of the little patients recover. This is not the hasty conclusions of an overwrought fancy, influenced by some finely-spun theory, but the conscientious conviction that emanates from the experience of physicians who have for years given this subject their careful, earnest attention. It is in accordance with your own experience, gentlemen, who have often seen your best efforts baffled by these counteracting influences of the surrounding sources and propagators of disease.

I have often found an apparent unwillingness on the part of tenants to acknowledge the truth in regard to the actual amount of sickness occurring amongst them, often pursuing my inquiries as far as the third floor, and there learning that deaths had occurred from fever, or cholera infantum, after having been told repeatedly that there neither was nor had been sickness in the house. I have not been able to account for this unwillingness to communicate information; but having seen it manifested on so many occasions, have no doubt that much of the truth escapes the knowledge of the inspector, and that a greater amount of disease has been present than we have been able to learn. Besides epidemic influence, there are many diseases propagated by certain noxious emanations arising from the bodies of those laboring under the same diseases, diffusing themselves through the atmosphere, and entering the body during respiration; or in other instances attaching themselves to certain substances (fomites), by

means of which they may be transported to places far remote from their original development, still remaining active elements of disease. If this contagious or infectious element be diluted by a sufficient amount of pure air, or, in other words, if the apartments of the sick are well ventilated, and proper hygienic precautions observed by the friends and attendants, there will be but little danger from exposure to its influence. If, on the other hand, it be confined to crowded tenements, filthy courts, or narrow and dirty streets, all of which are exposed to the effluvia arising from open privies, cesspools, decomposing animal and vegetable matter, and the exhalations from living bodies, the result is quite different, and the demon of contagion stalks forth in all its power and malignancy, seizing its victims upon every side, and increasing the bills of mortality to a frightful degree. It is, then, to epidemic and contagious influences when associated with overcrowding and want of ventilation, the miasm arising from the filthy and disgusting condition of external surroundings, the dissipated habits, poverty, and destitution often prevailing in these localities, that is due the greater portion of preventable disease; and it is by the absence of these epidemic and contagious influences, the naturally healthy topography, and the occasional fresh breezes from the Hudson, that I account for the fact of there being no greater amount of sickness in certain portions of the Twentieth District, where so many causes of insalubrity exist. Another cause of disease which deserves particular attention from our authorities, is the inferior quality of food used by the poor, especially the miserable half-wilted vegetables and unripe fruit, either hawked through the streets or found in profusion at the various small groceries throughout the city. To this may be added the milk from swill-fed cows with which some portion of our city is still supplied, the evil effects of which have on previous occasions been most graphically portrayed; and the very poor liquor in which a portion of the poor of both sexes too freely indulge, under the erroneous impression that a certain amount of stimulus is alike necessary to protect them from the cold of winter and the diseases peculiar to the summer months, thus paving the way to intemperance and every consequent vice. The fact that "disease has ever been remarked to go hand in hand with poverty and want, and to be proportionate to their extent," should also warn us to look well to the sanitary condition of our city. We are in the midst of a season of high prices, with the laborer's remuneration inadequate to the bare necessities of life, and the prospect of a severe winter before us, the inevitable consequence of which will be to so reduce the vital forces, and weaken the powers of resistance to external impressions, as to convert what may in seasons of plenty be considered merely predisposing, into active or ex-

citing causes of disease. As an illustration of this I need only allude to the fact that fever is pretty sure to follow a famine, originating in the more filthy localities, and selecting its first victims from among those whom the various causes above mentioned have combined to render more susceptible to the reception of contagious or malarial poison. Even though we were so fortunate as to pass through the present winter, and escape the visitation of any severe epidemic or contagious disease, what may we not reasonably expect during the following season, if the many nuisances above described are allowed to remain unabated? Will not the germs of disease here so carefully nurtured, be rendered ten fold more active upon constitutions already reduced by insufficient food and clothing, to say nothing of the nervous exhaustion induced by the depressing passions to which the poor are subjected in every season of destitution and want?

It is a well-known fact that a large amount of disease occurring in our midst is of a preventable character, and in a great degree subject to sanitary laws, in the observance of which the people, especially the poor, need to be educated. As an instance of the neglect of precautionary measures, either through ignorance or carelessness, I would state that while inspecting a court containing some 25 families, I found, in addition to the usual sources of insalubrity, 8 children between the ages of 1 and 12 years, who had never been vaccinated. If people will continue to neglect measures so simple and yet so effectual, notwithstanding the repeated epidemics of small-pox with which our city is visited, the time must arrive when compulsory vaccination will be imperatively demanded, not only for our own protection, but as a duty which New York as a great commercial centre owes to the surrounding country. People from all directions are continually visiting our city, and carrying away with them to their respective neighborhoods the germs of this most loathsome disease, than which nothing is more under the immediate control of preventive medicine. What is true of fevers and small-pox may also be said of the greater part of infantile disease. During four weeks in the month of August of the present year, there died in this city 1,773 children, 1,626 of them being children of foreign-born parents, a great majority of whom we know belong to the laboring classes, and live in crowded tenements or pent-up courts, surrounded by filthy gutters, garbage-boxes, neglected privies and cesspools, to which with the adulterated milk and stale vegetables with which these poor innocents are fed, is due a great portion of this infant mortality. Notwithstanding, however, the yearly repetition of these facts, we read in the last Report of the Registrar of Records and statistics to the City Inspector, that "this talk about the

number of lives that are lost each year for want of proper sanitary measures, is a perfect fallacy." * As an off-set to this luminous effusion I would beg leave to close this portion of my subject by another single quotation: "Nature deals out death with terrible severity to those who violate her laws, even in ignorance; and it is for the most only through dearly-bought experience that those laws are ascertained." †

Conclusion.—I have thus far endeavored to give a faithful though brief account of the sanitary condition of the southern half of the Twentieth Ward. A more extended report would require more time and space than is allotted me, and it now only remains for me to suggest such remedial measures as would most probably conduce to sanitary improvement:

1. A more thorough system of drainage by means of sewers and waste-pipes, is, I believe, imperatively demanded; and for reasons advanced under the head of sewerage, I think the improvement there suggested admirably adapted to our necessities, both for efficiency and economy, it being easily applied to all sewers now, or hereafter constructed. The house drainage should consist of pipes of suitable capacity and impervious material leading directly from each house to the sewer, instead of one being connected with several houses as is now too often the case; and the waste-pipes through the house should be so thoroughly trapped as to render the escape of sewer gas impossible. I would recommend the entire removal of cesspools from courts and alleys, and the introduction of tubular drains leading into the street sewer.

2. The old-fashioned cobble pavement should be wholly dispensed with, and that of cubic blocks of trap-rock substituted, as affording greater facilities for cleaning, and therefore more conducive to health. With this pavement, I would insist upon the streets being swept so frequently as to obviate the apparent necessity for sprinkling, for reasons elsewhere given.

3. I would recommend the removal of slaughter-houses from the city, and the annihilation, if possible, of the garbage-box, adopting some system for the removal of garbage from the houses without its being exposed for any time upon the sidewalk. The present system of sending a bell-man in advance of the cart, as practised in some of the streets, might be made very efficient, if properly executed. I would then impose a heavy fine upon every green grocer, meat, fish, or poultry dealer who throws any of his refuse material, whether animal or vegetable, into the gutters or street, as is now too frequently done.

* City Inspector's Report for 1863, page 335.

† Local Reports on the sanitary condition of the laboring population of England and Wales, 1842, page 150.

4. The privies to tenant-houses should be connected with the street sewer, by means of tubular drains of sufficient capacity and inclination to prevent their obstruction, through which a current of water might be made to pass at intervals, with sufficient force to insure its thorough cleaning. The plan in use at the public schools is perhaps the best for tenant-houses. Even as now constructed, tight-fitting covers to the seats, and a ventilating tube extending high above the roof, would afford some relief, as the effluvium there, if carried to a sufficient height, might be diluted or dispersed by a current of air.

5. I would recommend that a system of marketing be instituted by which the consumer is brought into immediate relation with the producer; thus placing within the reach of the poor of our city good wholesome food, in place of the miserable half-wilted trash almost universally used by this class of people.

6. I would have the entire sanitary interests of the city intrusted to a board composed of well-educated medical men, with whom should be associated engineers and architects of acknowledged ability, whose advice should at all times be sought upon questions coming within the sphere of their professional duties. This sanitary board should have power to appoint inspectors, consisting of at least one medical man to each ward, with a competant assistant, to take the place of those myths the health warden and his assistant. These ward officers should have power to suppress all nuisances, to enforce certain sanitary regulations, including both out-door and in-door cleanliness, to investigate, and as far as possible remove all apparent causes of preventable disease; and, in short, to exercise a general supervision over the entire sanitary interests of their respective wards.

7. The establishment of a vaccine bureau, with an adequate number of inspectors, whose duty it should be to visit and present the subject of vaccination to every family in their respective districts, offering gratuitous vaccination to all who are unable to pay for it, and urging upon others the importance of attending to the matter at the earliest opportunity. Such a course would eventually expel the small-pox from our city, or at least limit its ravages to a few isolated cases.

8. The passage of a building act prohibiting the present system of crowding and building houses on plans so injurious to health, the occupation of cellars for dwellings, and subjecting to certain restrictions the construction of courts and rear houses. For what calls most imperatively for reform, is the present construction of tenant-houses as regards light, ventilation, and every necessary comfort. Not only does the present system of overcrowding these pent-up and unventilated apartments, and

the consequent necessity of inhaling an atmosphere loaded with carbonic acid gas, and the poisonous exhalations from human bodies, enervate the physical powers, and predispose to diseases of the worst type, but its demoralizing effects are fearful to contemplate, and instead of being the most attractive, home is often rendered the most uncomfortable and uninviting spot on earth. Hence it is that the husband spends his evenings at the neighboring dram-shop, or the gambling-house, in search of comforts which his own fireside denies him. Hence it is that children reared amid these scenes of poverty, intemperance, and the whole train of their attendant evils, becoming daily more familiar with profanity and every species of wickedness, grow up willing and early victims to whatever vicious or criminal course may seem to them more attractive than their own miserable abodes. And hence I believe much of the vice, immorality, and crime of our city to be due to the construction, overcrowding, and mismanagement of tenant-houses.

Efforts are from time to time made to relieve the condition of the poor, for which associations and individuals have contributed largely, all of which, however, is but a sprinkling of rain upon this great waste of human misery and destitution. The man of God who, in the exercise of his sacred office, frequents these abodes of poverty in the hopes of directing the attention of some poor creature to the One thing needful, too often encounters only that sullen or desponding indifference resulting from a long familiarity with every thing that is cheerless and unattractive. If we would elevate the condition of these people, we must begin by relieving their social and domestic necessities, and furnishing them with habitations where they can enjoy sunshine and pure air, with abundant facilities for personal and domiciliary cleanliness. We then shall have taken the first step toward improving their moral as well as physical condition, and pointing them to the fulfilment of man's higher destiny. But the dark and cheerless rear tenement, with its unventilated apartments, its damp and dingy walls, and the attendant neglect of all sanitary measures, is wholly incompatible with man's social and moral nature, destroys all noble aspirations, ruins the most vigorous health, and opens wide the gate to mental, moral, physical, and spiritual death.

THE ROYAL SANITARY INSTITUTE LIBRARY

REPORT

OF THE

TWENTY-FIRST SANITARY INSPECTION DISTRICT.

JAMES L. LITTLE, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Twenty-first District comprises the northern half of the Twentieth Ward, and is bounded north by Fortieth Street, east by Sixth Avenue, south by Thirty-third Street, and west by the Hudson River. It contains 47 squares.*

TOPOGRAPHY.—The original surface of this section of the city was high, rocky, and very uneven. The general slope was to the west, although a portion inclined to the south and east. This condition of the surface afforded good facilities for drainage, the greater portion of the water flowing into the Hudson River on one side, and on the other running into streams which emptied into the East River.

The highest ground began at Thirty-third Street and Sixth Avenue, running in a northerly direction as far as Thirty-fifth Street and Seventh Avenue; here making a turn to the west it ended abruptly in rocks at the foot of Thirty-ninth Street. This high ground was formed by two hills running nearly north, then west, and parallel to each other. The summits of these hills were formed by outcropping rock projecting above the general surface.

On each side of the Bloomingdale Road (Broadway), from Thirty-fourth Street to Forty-first Street, the rock was about fifteen feet above the common plane. It was not in one continuous chain, but appeared alternately on one side and then on the other. It also outcrops above the surface on the banks of the Hudson River in numerous places. This rock is principally gneiss, with veins of quartz running tortuously through it.

Along the river, granite of an inferior quality is found. The original highest elevations of ground in this section are at Thirty-third Street and Sixth Avenue, Thirty-fifth Street between Eighth and Ninth Avenues, and Thirty-eighth Street a short distance east of the Eleventh Avenue. These points were from fifty-eight to sixty feet above the high-water mark. The present elevations above high-water will be seen by reference to the sanitary map. The land in this section, on account of the elevation, is naturally very dry.

Water-courses.—There were two small, shallow ponds, one at the corner of Thirty-fifth Street and Seventh Avenue, and the other between Thirty-eighth and Thirty-ninth Streets, a short distance east of the Seventh Avenue.

The pond at the northeast corner of Thirty-fifth Street and Seventh Avenue extended about one-half across the present street and avenue. From this pond a small stream flowed in a northerly direction between the hills before mentioned, and emptied at about the present corner of Fortieth Street and Tenth Avenue into a larger stream which originated between Forty-third and Forty-fourth Streets and Eighth Avenue, and flowed north, then westwardly, and then taking a southerly direction ran through a marsh at Fortieth and Forty-first Streets and Tenth Avenue, and finally emptied at the foot of Forty-second Street into the Hudson River. The pond between Thirty-eighth and Thirty-ninth Streets, near Seventh Avenue, was about one hundred feet in diameter. This was connected by a drain to another pond in Forty-second Street, about midway between Sixth and Seventh Avenues. Another stream started from Thirty-seventh Street and Eighth Avenue, flowing in a northwesterly course, and emptied at Forty-second Street and Ninth Avenue.

Streets.—The condition of the streets in the Twenty-first District varies with the neighborhood. In that portion east of Eighth Avenue, which contains the better class of dwellings, they are generally kept in a cleanly condition, especially those streets which are paved with the Belgian pavement.

The streets west of Eighth Avenue, with a few exceptions, are paved with cobble stones, are at all times out of repair, and at all times in a very dirty condition, and are constantly obstructed by old casks, barrels, and other truck. As we approach Tenth and Eleventh Avenues, some of them in wet weather are almost impassable. The Eleventh Avenue is always in a filthy condition, and seems to be entirely out of the range of the street-sweepers, who occasionally make their appearance in other parts of my district. The surface filth of streets being composed of mud, offal,

and vegetable and animal refuse that are exposed during the summer months to the hot sun, gives rise to the constant evolution of deleterious gases which poison the atmosphere, and thus exerts a deleterious influence on the health of those living in the neighborhood. And those streets that are in the worst condition are generally those in which hundreds of human beings are crowded in ill-ventilated tenant-houses.

SEWERAGE.—The Council's Sanitary and Topographical Map will show the sewerage of my district. I would call the attention of the Council to the sewer in Fortieth Street, between Ninth and Tenth Avenues. This is constructed after a plan suggested by Mr. Serrell, one of the city surveyors. It is furnished with a series of traps called dirt-catchers, by means of which the solid matter from the sewers is saved, and may be used for fertilization; and it is also prevented from filling up the river at the mouths of the sewers. For a full description of this excellent plan of sewerage, I beg leave to refer you to the report of Dr. Janes, inspector of the Twentieth District.*

BUILDINGS.—The better class of buildings in this district is mostly situated in the streets east of Eighth Avenue, and as far as examined are furnished with all the modern improvements. As time would not permit me to make a thorough inspection of these houses, I am unable to state their precise sanitary condition.

There are 330 stores in this district, and 147 places where liquor is sold.

TENANT-HOUSES.—In my district there are 417 tenant-houses, of which 345 are built of brick; 72 are frame buildings. There are 361 front and 56 rear buildings. Of this number 321 are furnished with proper sewerage, and the remaining 105 have no communication with the sewers. Slops, &c., are thrown into the street gutters and garbage-boxes. There are 2,614 families, comprising 11,993 individuals, living in these tenant-houses, of whom 337 live in cellars.

Ventilation.—These houses are constructed so as to contain as many families as possible, and generally no attempt is made to secure for the inmates proper ventilation. This is one of the chief causes of the high rate of mortality which occurs in these buildings. In the words of a member of the Council of Hygiene: "The close, uncleansed, unventilated residences of the poor, become the homes of disease and pauperism; the crowded tenements into which avarice drives poverty, in filthy streets and noisome courts, become perennial sources of deadly miasmata that may

* See the diagrams representing Mr. Serrell's improvements, pages 234–236.—EDITOR.

be wafted to the neighboring mansions of wealth and refinement, to cause sickness and mourning there." *

Impurity of the air and a miserable home involves ill health, degradation, and an early death; and the subject of providing proper homes for the poor and the laboring classes of this city, is one which should engage the earnest attention of our Legislature.

Fig. 1. Fig. 2.

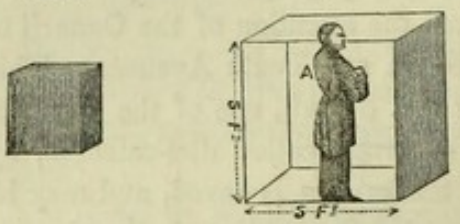
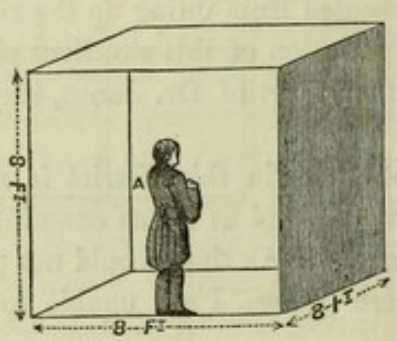


Fig. 3.



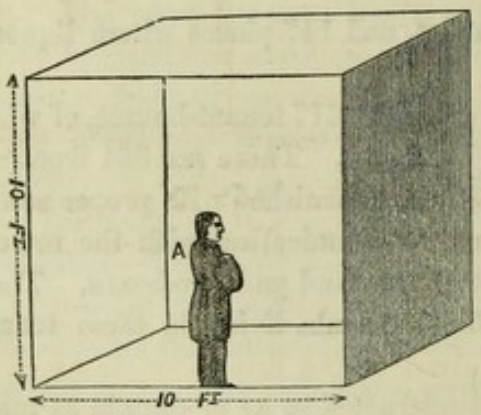


Fig. 4.

According to authority, a person breathes 14 cubic feet of air per hour. This quantity of air, when returned from the lungs exhausted of the vital element oxygen, is charged with carbonic acid to such an extent that it vitiates to a great and poisonous degree 100 cubic feet more of air. The annexed figure represents this 14 cubic feet which is used per hour by each individual. The adjoining figure 2 represents a space of 125 cubic feet.

The inclosed figure represents a man of ordinary size compared with the above cubic space, and it shows at a glance the small amount of air provided for the individual. The next figure, 3, shows a space of 512 cubic feet as compared with the size of an ordinary person.† Now many of the dormitories of these tenant-houses contain about this amount of space, and are generally occupied by two adults and several children.

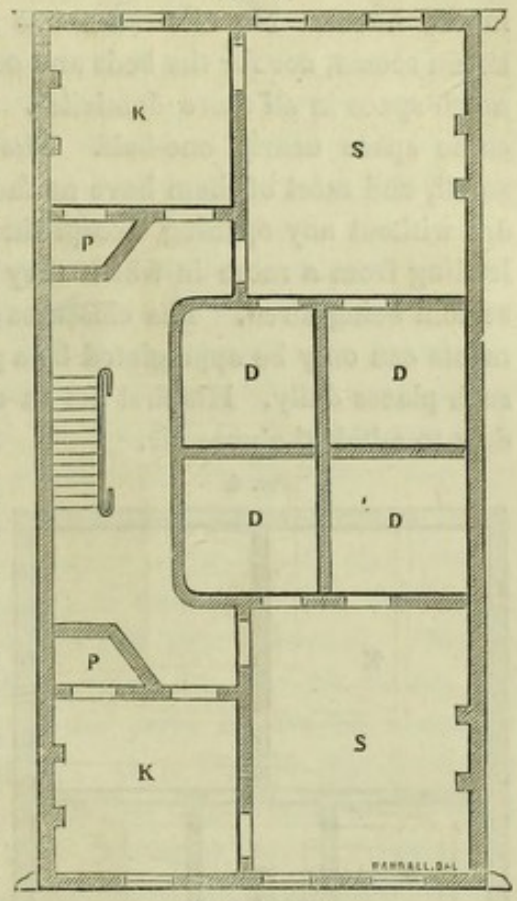
This engraving (Fig. 4) shows the proportion which 1,000 cubic feet bears with the above, and this amount of space few if any of the dormitories give to a single individual. This in an hour would contain nearly five times the amount of carbonic acid, and soon there would be an excess of impure air for each individual.

* *Outline of the Progress of Sanitary Improvement.* By Dr. E. Harris. Wiley and Halstead, 1858.

† *The Builder*, Vol. 17, page 54.

Figure 5 represents a ground plan of one of the prevailing modes of constructing tenant-houses. This is a tenant-house of the better class. Two families live on one floor, and have a kitchen, sitting-room, and two bedrooms, which are without any opening except the door by which they are entered. One family (not one of the poorest class) living in this building, was composed of five adults and three children. Two of these adults, one of whom was sick, occupied one bedroom, D, and the remainder of the family, six in number—three adults and three children—slept in the other bedroom, D, measuring $7\frac{1}{2} \times 8\frac{1}{2} \times 8\frac{1}{4}$ feet. Now there is only 526 cubic feet of space in this room, and by careful measurement it was ascertained that 129 cubic feet of this space was taken up by the bed and by old clothes and rubbish which was packed in the room, so that these six were compelled to sleep in one bed, with an allowance of about 66 cubic feet of air in the room to each person!

FIG. 5.



FLOOR PLAN.

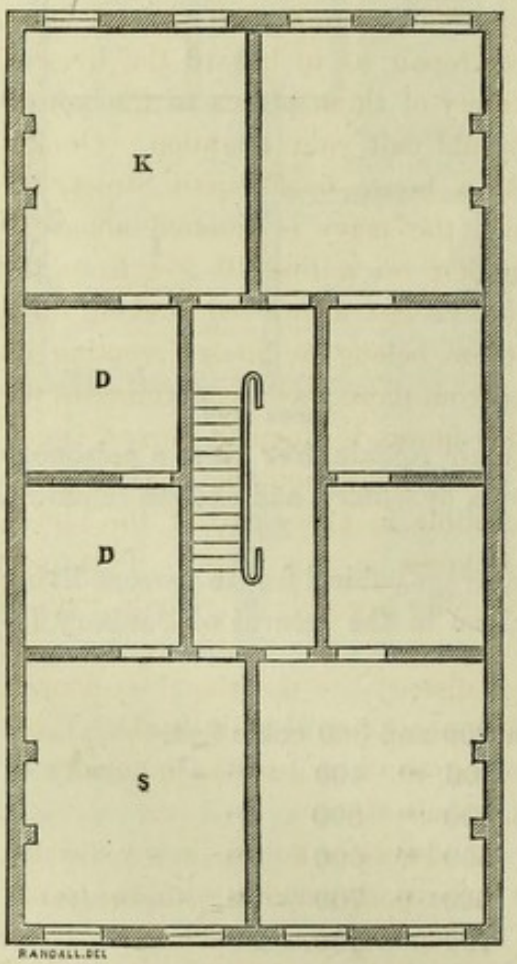
How long in such a room does the air remain free from a poisonous effect? And is it any wonder that fever, dysentery, and cholera infantum is prevalent in such habitations?

The following table will show the average cubical feet to persons living in tenant-houses in this district, as given in the returns of Sanitary Inspection:

103	persons	have	between	200	and	300 cubic feet.
330	"	"	300	"	400	"
1,486	"	"	400	"	500	"
2,355	"	"	500	"	600	"
2,351	"	"	600	"	700	"
1,689	"	"	700	"	800	"
1,239	"	"	800	"	900	"
903	"	"	900	"	1,000	"
1,537	"	"	1,000	and	more	"

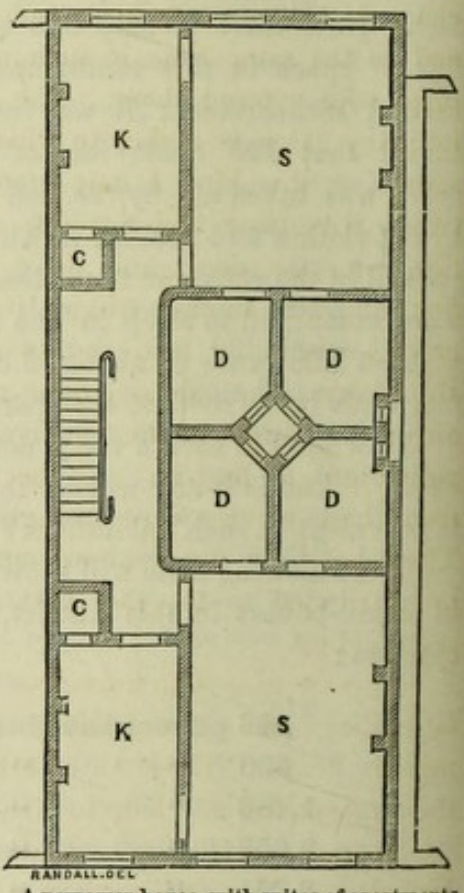
This estimate was made under the direction of Captain Lord, of the Sanitary Squad of the Metropolitan Police. The number of cubic feet of space in the whole building was divided by the number of persons living in the house. No allowance was made for the halls and partitions between rooms, nor for the beds and other articles of furniture which occupy much space in all these domiciles. This would diminish the amount of cubic space nearly one-half. The sleeping-rooms of these houses are small, and most of them have no facilities for ventilation. Many of them are without any opening except the door by which they are entered, this leading from a room in which they live and cook their meals, this room seldom being aired. The closeness and impurity of the air in these apartments can only be appreciated by a physician whose duty calls him to visit such places daily. His first act on entering such room is to open the window to admit the pure air.

FIG. 6.



Tenement with suites of apartments for two families upon each floor, and with through-and-through ventilation.

FIG. 7.



A narrower house, with suites of apartments for two families; the bedrooms specially ventilated by means of a central ventilating shaft; ventilation of the sitting-rooms aided by *through* currents.

Another way of building which provides through-and-through venti-

lation, is represented in Fig. 6. This is so arranged that two families can occupy one floor, and each have a parlor, S, kitchen, K, and two bedrooms between, D, D. There are two houses in Thirty-ninth Street, between the Eighth and Ninth Avenues, owned by Mr. Connelly, which are constructed as the diagram shows (Fig. 7), with a ventilating shaft running from the basement to the roof. Into this the bedrooms open by means of windows. This plan allows a certain amount of ventilation to take place; and although not presented as a model tenement, yet I think it is an improvement upon the old way of building tenant-houses.

PRIVIES.—The privies generally stand in the yard, adjoining the house; one set of privies being used for two houses. In the majority of cases they are connected with the sewers. But there are also many which are not thus connected, and these constitute one of the greatest evils of this city. Many of them are allowed to become full to the extreme limit provided by law, and remain in this condition for weeks before they are cleaned. During my inspection I reported a number which were filled, and at the same time in such need of repair as to hazard the lives of those who entered them. The proximity of these places to the houses in many cases is a fact to which I would call your attention. One instance of this kind I may state: At a house in Fortieth Street, between Broadway and Seventh Avenue, the privy is situated about 10 feet from the door, and there is another on a line 10 feet from the first, and still another within 10 feet of the last mentioned, making three privies within 30 feet, and two of these belong to houses fronting on Broadway. The offensive odor arising from these places contaminates the air of the houses in the vicinity. This house, in Fortieth Street, is actually unfit to live in. At the time of my inspection the noxious gases from these privies were strongly perceptible in every part of the house. There has been no great amount of sickness in this house. This may be attributed to the fact that few families are able to remain long in the building.

NUISANCES.—The nuisances in my district are the slaughter-houses, fat-boiling and gut-cleaning establishments, swill-milk stables, and manure heaps. These all, in their several ways, add to the impurities of the atmosphere, and help to create and foster disease.

SLAUGHTER-HOUSES.—There are 23 slaughter-houses in my district. Included in this number are several large pork-packing establishments. With few exceptions these places are kept in tolerable good order. There are, however, several which are situated in streets which are not sewered, and the blood and liquid offal is conducted by drains into the street gutters. In one instance in Thirty-ninth Street, the blood and liquid offal flows the

distance of two blocks before it empties into the river. This, during the summer weather, undergoes decomposition, which gives rise to a very offensive odor, and certainly must exert a very injurious effect upon the health of those living in the vicinity. The presence of slaughter-houses within the limits of the city, situated as they generally are amid a crowded population, cannot but be objectionable in a sanitary point of view.

The Registrar-General of Great Britain, in his report for the year 1851, exhibits the relative mortality of different occupations as compared with that of all England. And he states, in remarking on the position occupied by butchers: "This useful body of men experiences a much higher rate of mortality than any other class except the licensed victuallers.

"Thus from the age of 35 to 45 the rate of mortality per 1,000 among farmers, was 9; carpenters and joiners, 10; shoemakers, 11; blacksmiths, 12; tailors, 14; bakers, 15; butchers, 17. At the next decimal age, 45 to 55, the mortality of butchers was 23; at 55 to 65 it was 41, or higher than that of any other class." And he further states that the most powerful cause of this high mortality probably depends on the elements of decaying matter by which the butcher is surrounded in his slaughter-house and its vicinity. Now if this be true, then it is certain that the presence of slaughter-houses in the midst of a large city must have a very deleterious influence on the public health. Dr. Stephen H. Ward, of London, states he has "known houses to which slaughter-houses were adjacent, in which scarcely a year elapsed without a case of fever being developed."

Fat-boiling and Gut-cleaning Establishments.—There are in my district several large establishments of this character. These places constitute the most obvious and abominable nuisances in my district. The smoke or gas emitted from their chimneys spreads itself over the upper part of the city, and on days when the atmosphere and wind are favorable the stench is perceptible for full a mile and a half from the buildings. This offensive odor is certainly injurious to the health of those constantly inhaling it. According to the City Inspector's report for 1859 the bills of mortality in the neighborhood of these establishments show an alarming disproportion of deaths over those sections of the city where they are not suffered to exist. My own observations have shown me that it operates very unfavorably on those who have weak lungs. In cases of pulmonary disease it has an irritant effect, exciting severe and exhausting fits of coughing. Some of these establishments have existed in this part of the city for many years; and in conversation with one of the proprietors, he stated that if the city would pay the loss incurred by their removal they would at once

take measures to leave the city. Some are already making their arrangements to this effect.

Swill-milk Establishments.—One of these detestable establishments exists in my district. I visited it during the course of my inspection, and every facility to examine it was afforded me by those in charge. In these stables there were at the time of my visit over 300 cows. These were confined in a building about 25 × 60 feet, containing from 20 to 24 cows each. They were arranged in double rows, tail to tail, in stalls about four feet in width. In front of each row of cows there was a trough to contain the swill. In these stables a disease occurs as an epidemic, and to save the cows from this malady *inoculation* is resorted to. "This is performed by cutting a slit in the skin of the animal's tail, and binding therein a piece of the lung of an animal that has died of this disease. In consequence of the introduction of poisonous virus the tail swells, inflammation takes place, and not unfrequently the inflammation is so great that the tail swells to four or five times its natural size, and has to be amputated to save the life of the animal. Hence the name 'stump tail.'"* Whether this mode of proceeding does really prevent this disease is somewhat doubtful.

The cows that I saw at the time of my visit were in tolerably fair condition, only a few "stump tails" were to be seen. This may possibly be accounted for by the fact that for some time past the distillery to which these stables are connected has not been in operation; the swill for these animals being brought from other distilleries, consequently they do not get as much as they would if it could be had on the premises. I was told that the cows were fed on but little swill and considerable meal and hay. These cows are owned by persons who reside in the neighborhood, and who retail this unwholesome milk to the poorer classes who reside in this neighborhood. That it is possible for cows confined in crowded, ill-ventilated stables, and fed on such food, to give forth good healthy milk, is manifestly absurd. On the contrary, that it is absolutely poisonous in its effects has been shown by the investigations of the New York Academy of Medicine in 1857.

Another evil in connection with swill-milk in this city is mentioned by the City Inspector in his report of 1859, and also by Dr. Percy in his paper on the food of cities, and also which has come under my own observation. These cows are allowed to remain in the stables as long as they yield a sufficiency of milk, usually for about a year, after which they are slaughtered, and if the meat has at all a salable appearance it is put into the market and sold.

* "Food of Cities," by Samuel M. Percy, M. D. Transactions of the N. Y. State Medical Society, 1864.

About a year ago I had an opportunity to see one of these cows, which was on the point of dying from disease, slaughtered, and on removing the hide there was scarcely any fat to be seen. One of the lungs presented the appearance of being in the third stage of pneumonia. A microscopic examination of a portion of the lung showed pus cells in great numbers. This was saved for the purpose of inoculation. The liver was soft and studded with abscesses. This animal was in *such a bad condition that its flesh was pronounced unsalable.* Other animals, however, which were not quite so much diseased, were dressed and ready to be sold: of course to the poorer classes. But it is useless to dwell on the evil effects of these places. A total abolition of them in this city and elsewhere is called for, for the sake of the suffering poor, who are generally the victims to the effects of this traffic.

A proper enforcement of the "act to prevent the adulteration of milk and the traffic in impure and unwholesome milk, passed April 23d, 1863," would entirely suppress this business.

Manure Heaps.—Several large vacant lots are used in my district for the accumulation of stable-manure. Thousands of loads are gathered together upon these lots and allowed to undergo the process of "rotting," requiring months to fit it for market. To expedite the process of "rotting" gangs of men are employed at stated periods to overturn the matter, and to expose to the heat and rains such portions of the manure as may not have previously partaken of the benefits of these elements. The stench arising from these accumulations of filth is intolerable.

Offal Dock.—This is situated at the foot of West Thirty-eighth Street. Here the carcasses of horses, cows, and other dead animals, and also the offal from the slaughter-houses, are brought to be removed from the limits of the city. This is done by sloops, which receive their cargo during the day and remove it at night. The lungs and other useless material are required by law to be conveyed outside the Narrows and thrown into the water. The legs of the larger animals are removed and skinned on the dock. The tendons are saved to be made into gelatine and glue. The hoofs are used in the preparation of Prussian Blue.

The bodies of these animals and part of the refuse from slaughter-houses are removed to a place on the Hudson River, opposite Hastings. Here the animals are skinned, the hides salted, and sent back to the city to be converted into leather. Some of the bones are used to make buttons, handles of knives, and other useful articles. Most of them, however, are converted into animal charcoal. Other refuse parts of the animals are used in the preparation of a patent fertilizer.

The butchers are required by law to remove their offal twice a day. This regulation, however, is not always complied with, and it is allowed to accumulate in the slaughter-houses until decomposition takes place; it is then carted through our streets, often carried in open barrels, which allow a certain amount to be spilled in the street, emitting a very noxious odor. I was told that the butchers who bring offal in this condition were sometimes arrested, but the true remedy for such an evil would be the vigilant eye of a good sanitary inspector.

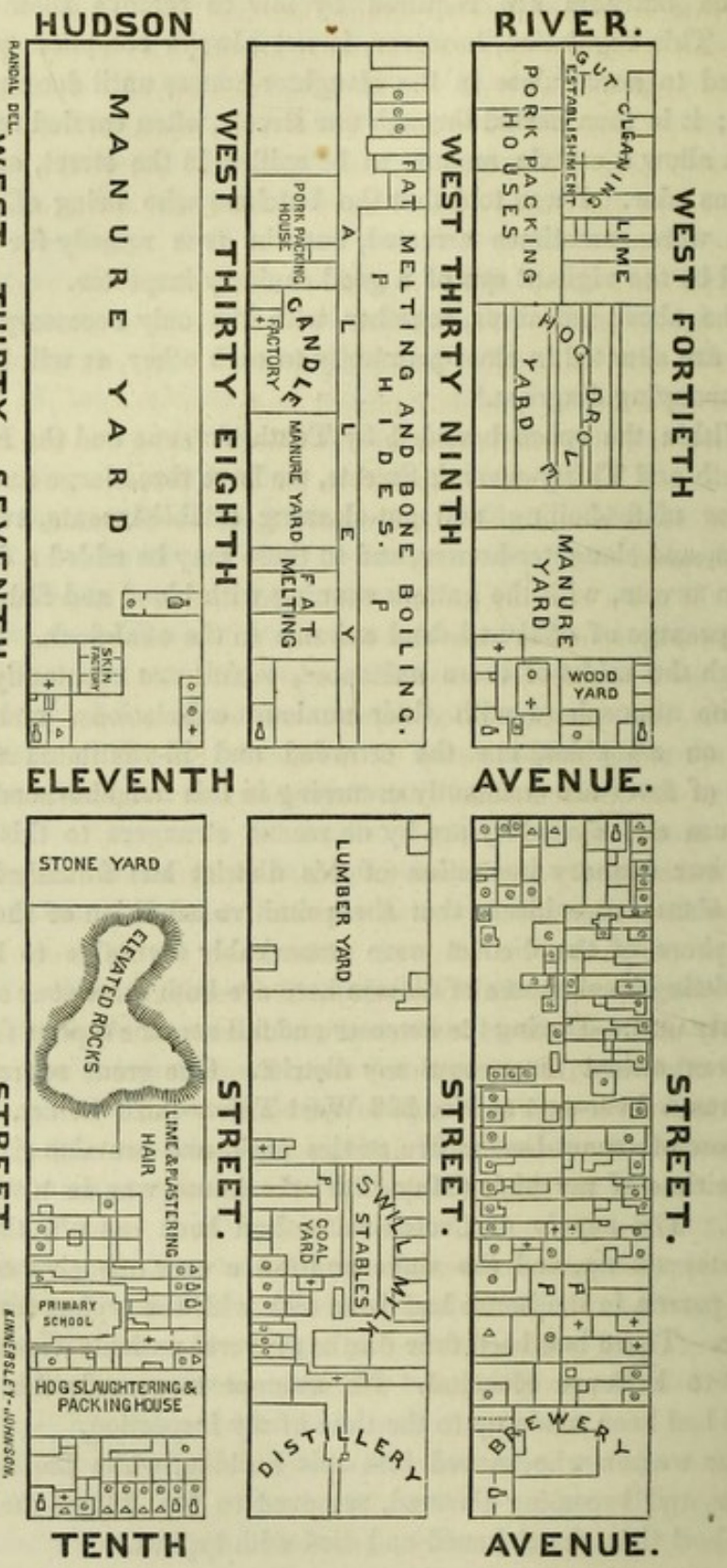
The above nuisances, together with the only necessary one the offal dock, are situated in close proximity to each other, as will be seen by the accompanying diagram.*

Within the space bounded by Tenth Avenue and the Hudson River, Fortieth and Thirty-seventh Streets, we have three large manure yards, a number of fat-boiling and gut-cleaning establishments, swill-milk cow-stables, and slaughter-houses, and to these may be added a dirty condition of the streets, with the gutters running with blood and filth, and the constant passage of offal and dead animals to the offal-dock. And scattered through the midst of these nuisances, which are constantly contaminating the atmosphere with their noxious exhalations, and surrounding them on all sides, are the crowded and ill-ventilated tenant-houses. Cases of fever are constantly occurring in this neighborhood, and cholera infantum and dysentery are by no means strangers to this vicinity. In short, our sanitary inspection of this district has furnished to our own mind abundant evidence that the primitive condition of the soil and the atmosphere of the district were remarkably favorable to health; while the existing local causes of disease here are both numerous and neglected.

Diseases.—During the summer and fall months typhus fever prevailed to a great extent throughout my district. One great source of this disease was a fever-nest at No. 293 West Thirty-third Street. This is one of a row of tenant-houses five stories high, and contains sixteen families. At the time of my visit (May 12th) the house was in a very dirty condition. The supply of Croton-water had been cut off, the waste-pipes were stopped up, and the sinks emitted a very offensive odor. Nearly every person in the house had been sick with the typhus fever during the winter. There had been four deaths; several patients were sent from this house to Bellevue Hospital. No attempt to remedy this condition of things had been made up to the time of my inspection.

One woman who moved into this building while the fever was prevailing, and becoming alarmed, removed to No. 283 of the same street. In a short time she sickened and died with typhus.

* See next page.



REGION OF BONE-BOILING AND SWILL-MILK NUISANCES.

Now it is absolutely certain that had this house been thoroughly cleansed when the first case of fever appeared, it would have checked the disease and several lives would have been saved. But no such precaution was taken, and the fever continued to spread through the tenements.

Soon after my inspection the house just referred to was thoroughly cleansed by the owners, and I have heard of no new cases occurring there since.

This fever-nest affords a striking example of what might be accomplished in reducing the mortality and sickness of this city by a well-organized and competent health department. If, when the first case of fever occurred in this building, it had been reported by the attending physician, and visited by a medical inspector, its hygienic wants ascertained, and the owner compelled to put it in proper sanitary condition, six human lives would undoubtedly have been saved, besides a great amount of sickness.

Is it not a burning shame that, while such a large amount of money is annually spent in this city for the public health, that typhus, or ship fever, as it is sometimes called, can prevail in one building for over four months, and yet no notice being taken by the proper authorities, and no attempt being made to stop its ravages? Such is the fact, however, and even at this present time such fever-nests or plague-spots exist in many parts of the city.

Another fever-nest existed at No. 444 Tenth Avenue; but at the time of my inspection the fever had entirely ceased, the house having been put in a proper sanitary condition. Other cases of this fever have come under my observation in Thirty-seventh, Thirty-eighth, and Fortieth Streets. Nearly all these cases received the contagion at some other place. Two cases of fever in Fortieth Street near Tenth Avenue, occurred in my own practice, which were traceable to the house at No. 444 Tenth Avenue. At the present time, December 1864, small-pox is prevailing to an alarming extent in this district, as it does in various other parts of this city.

I thus submit to your learned body in this report, the most important subjects that have come under my observation as sanitary inspector of this district. In conclusion I would state that, in my opinion, a competent sanitary board, with a thoroughly organized system of inspection, could do much toward preventing and arresting disease in this city.

REPORT

OF THE

TWENTY-SECOND SANITARY INSPECTION DISTRICT.

R. L. PARSONS, M. D.,
Sanitary Inspector.

BOUNDARIES.—*Bounded north by Thirty-third Street, east by East River, south by Twenty-sixth Street, and west by Sixth Avenue.*

TOPOGRAPHY.—For convenience of study this district may be divided as follows: First division bounded by Twenty-sixth and Thirty-third Streets, Lexington Avenue and the East River; the second division bounded by Twenty-sixth and Thirty-third Streets, Sixth and Lexington Avenues.

First Division.—This portion of the district is represented in Viele's report as being originally low. This is not quite correct. The space included between Twenty-eighth and Thirty-first Streets, Second and First Avenues, has not been filled in at all. The foundation is in some portion at least rocky, as the rocks may be seen cropping out at some points between the same streets west of Second Avenue. The natural sanitary condition is not quite as good; some of the ground has probably been filled in, and the present surface is more level, and not as well adapted to drainage. South of the section above mentioned, the land descends toward the south and east—is lower in some places, and has been filled in. East of Second Avenue, and between Thirtieth and Thirty-first Streets, there is a sudden descent; so that while Thirtieth Street is high and well built, Thirty-first Street is one of the most exceptionable in the district. The general descent of the surface north of Thirtieth Street is toward the north and east, a stream of water originally running from the neighborhood of Fourth Avenue and Thirty-second Street to the neighborhood of Thirty-fourth Street and the river, showing the direction of the drainage.

The squares east of Second Avenue are the lowest, most badly drained, and naturally in the most unfavorable sanitary condition of any in the district. The inhabitants of this section are poor, closely crowded and degraded, filthy in their habits and improvident. The sickness ratio also is much higher here than in other portions of the district; but owing to numerous other causes, among the principal of which are overcrowding, filth within and without, and bad ventilation, the exact influence of the first mentioned cause cannot be justly estimated.

Second Division.—The natural sanitary advantage of this portion of the district is good. The elevation is considerable, the descent sufficient for thorough drainage, and the nature of the soil does not in any way interfere with the salubrity of the district.

STREETS.—The direction and width of the streets and avenues in this district are in accordance with the arrangement of the streets and avenues in the upper part of the city, except that none of the streets are wide. The condition of the streets and avenues varies much in different parts of the district. In First Avenue there is a good cobble-stone pavement, but it is usually deeply covered with mud. The gutters are also made the receptacles of slops and garbage wherever the avenue is thickly inhabited. East of Second Avenue, from Twenty-sixth to Twenty-eighth Street, the streets are in fair condition, tolerably well paved, and the gutters are without especial obstruction. Still they are the receptacles of house-slops, garbage, and ordinary street filth. Twenty-eighth Street near First Avenue is sometimes rendered especially offensive from these causes. Twenty-ninth Street is better, and Thirtieth Street is generally unexceptionable. Thirty-first, Thirty-second, and Thirty-third Streets are badly paved with cobble stones, the gutters are in bad condition, either being obstructed and not having the proper descent, or being irregular, so that the stagnant water and slops stand in these depressions until washed away by heavy rains. The depressions in the streets are in like manner often filled with stagnant water and decaying garbage. The odor from this decaying animal and vegetable matter is often offensive in the extreme. During the dry term of the past summer, however, the street filth was so thoroughly desiccated, that the offensive exhalations were not nearly as abundant as during the corresponding season of the year before.

Second Avenue is kept in tolerably good condition, much better than are the streets above mentioned, but is always more or less disfigured by garbage-boxes, and the gutters are often used as receptacles of garbage and slops. Between Second and Third Avenues the condition of the pavements and gutters is very good, with the exception of Twenty eighth and Twenty-ninth Streets, which are more filthy than the others; the gut-

ters being often obstructed with slops and garbage, and the pavement covered with mud. In Twenty-eighth Street the surface drainage is especially poor.

Third Avenue is usually kept in very good condition. The avenue is paved with cobble stone, and the drainage is generally good. West of Third Avenue the streets and avenues are, for the most part, well paved, are free from nuisances, and the gutters have sufficient descent.

SQUARES.—The number of squares in this district is 55. Of these, 6 may be considered in a bad, 11 in a mixed, and the remainder in a good sanitary condition. (In this estimate of the sanitary condition of squares, the obvious conditions of cleanliness or uncleanliness, crowding or the contrary, &c., are considered, rather than the less obvious ones of the original nature of the ground, and its subsequent changes by filling in, &c.)

The causes which render squares insalubrious, may be considered under three general heads: (1.) The original formation of the soil, and the subsequent changes that may have been made. (2.) The condition of streets. (3.) The internal and external condition of domiciles.

(1.) The original surface was low and marshy in the northeastern, and to some extent in the southeastern part of the district. The whole of the eastern portion is noted in Gen. Viele's Report as low. Much of this low land has been filled in; and wherever the original course of the streams is obstructed, the tendency of the water is to percolate through the loose soil, thus making it damp and insalubrious. This is more especially true when the material filled in is composed in great part of decaying animal and vegetable matter.

(2.) The streets are to be considered as regards (a) the pavements, (b) the gutters, (c) the sidewalks, and (d) the sewers.

(*a.*) Pavements to be good should have an even surface, with as small interstices between the stones as is compatible with safety, with a sufficient and uniform descent from the middle of the street to gutters. In many of the pavements the contrary of these conditions hold: the surface is not even; the inequalities forming receptacles for water and filth of all kinds; the interstices between the stones are so great as to make cleanliness almost entirely impracticable, and the descent to the gutters is insufficient and irregular, so that the operation of natural agencies is, for the most part, ineffectual in thoroughly washing the pavements. Examples may be seen in Thirty-first Street between First and Second Avenues, and in Twenty-eighth Street.

(*b.*) The gutters have often in like manner inequalities in surface, and have an insufficient descent toward the culverts, so that they are never

thoroughly cleaned save by rains of more than ordinary violence. Thirty-first, Thirty-second, and Thirty-third Streets, east of Second Avenue, offer sufficient examples.

(*c.*) The sidewalks are, as a general thing, less objectionable in a sanitary point of view, and might be kept clean with ordinary care; but in point of fact they are often so filthy as to add to the other conditions of insalubrity above mentioned.

(*d.*) Sewers are wanting in some of the most densely-populated portions of the district, so that proper drainage for the removal of house-slops and the contents of privies, is impossible.

(3.) Under this head will be considered overcrowding.

(*a.*) *Overcrowding.*—Apartments are often so overcrowded that only from four to six hundred cubic feet of air is allowed to each occupant, taking into the estimate the whole suite of apartments; and by night the number of cubic feet to each individual is often reduced as low as two hundred feet. A house with these overcrowded apartments very often contains from fifty to sixty individuals, and not unfrequently from eighty to one hundred or one hundred and twenty. This overcrowding of apartments is a direct and powerful cause of the general deterioration of health in the occupants. It is especially manifested in the sickness and death ratio among children, who are almost constantly exposed, and have less power of resistance. For examples of the large sickness ratio among the children inhabiting these crowded apartments, it is only necessary to visit them and make a cursory inspection. And it may be added that of all the causes that tend to deteriorate the health of children, this is probably among the most efficient. In addition to the general cachexia above referred to, the occupants are predisposed to contract contagious and endemic diseases which they might escape if in better health; and when contracted, these diseases are rendered, by the above conditions, more difficult of control, and more fatal in their results. Thus we often see an endemic disease, as typhus fever, attacking in succession every unprotected inmate of an apartment. But instead of one crowded apartment there is usually a large number, so that the evil is multiplied still further. And not only this, but there are whole squares filled with these crowded houses, forming vast centres for the incubation and dissemination of disease. The remedy is simple, whether it be practicable or not, viz.: the limitation of the number of persons occupying apartments and domiciles.

(*b.*) *Ventilation.*—Want of proper ventilation is an especial cause of insalubrity in domiciles occupied by many families. It is a well-known fact that hospitals having windows on only one or on two contiguous sides, cannot be well ventilated by means of the doors and windows. These wards

require twice as much air-space for each patient as do wards having windows on opposite sides; the wards themselves being only of moderate width. Now, in almost all tenements of the worst class, and in the greater part of those of a medium class, each family occupies only part of one floor. Thus they have windows only on one narrow face, and, as the apartments are ususally heated by stoves, there is no adequate means of obtaining a current of air, even at these windows. At night the condition is still worse, for one at least of the bedrooms is situated at the middle of the building, having no means of ventilation whatever; and even in those dark bedrooms that have a window opening into the hall, the condition is very little better, as the scuttle is usually either closed, or inadequate in size if left open. The first step toward remedying this evil is to render better ventilation possible; and that by means at once the most economical and efficient available under the circumstances. Considerable advantage in this direction would be gained if the hall itself were ventilated. This might be accomplished by placing directly over the hall stairs a ventilator as large as the stair space, with fixed slats so arranged as to entirely keep out the rain, and with the entire space between the slats equal to the stair area. The roof of this ventilator might be made of glass, thus affording considerable light to the hall. The advantages of this arrangement would be, that the ventilator could never be closed, and that it would be sufficient in capacity. Then the air escaping about the crevices or through the open doors of the rooms, heated as they usually are by the persons of the inmates or otherwise, would seek an escape through the ventilator in the roof, and a current thus formed would make the ventilation not only of the hall itself, but also of the rooms adjoining, possible. The dark bedrooms might, as they often do, communicate with the hall by a window, and some communication might be made between the principal room and the hall, to facilitate its ventilation still further. An additional door for the principal room, made entirely of slats, with a narrow frame work, would be especially desirable in summer. In winter the current of air in the hall might be made much stronger by heating the hall itself, but this additional means of ventilation would probably be found impracticable save in the better class of tenements. In external ventilation the tenements in this district are generally not deficient. The principal obstructions are rear buildings. When these rear buildings are themselves tenements, an overcrowded population and obstructed ventilation coexist. The only remedy is obviously a removal of the cause.

(*c.*) *Cleanliness.*—Want of cleanliness is another great source of insalubrity. If decaying animal and vegetable matter in streets and cesspools is insalubrious, it is certainly no less so when on the stairs of domi-

ciles, in the halls, on the clothing of the inmates, and on the beds. In some apartments of tenant-houses the rags that cover the floor in lieu of a carpet reek with filth. They have become a receptacle for street-mud, food of all kinds, saliva, urine, and fæces. They are sometimes swept, sometimes wiped off with a wet rag, but they are never cleaned. The bed-clothing is often little better. The offensive odor from these coverings is sometimes exceedingly disgusting and persistent, so much so that when handled the hands become so permeated with the odor that notwithstanding all efforts in cleansing they are rendered positively disgusting for one or two days after. Add to this unclean persons and unclean clothes, and there is an aggregate of personal and domiciliary uncleanliness, of animal and vegetable poison, in the highest degree deleterious and prejudicial to health.

The remedy for these evils must be in great part indirect. The streets should be in good condition, properly cleansed, and properly drained; tenant-houses should have an abundant water-supply on each floor; there should be drainage-pipes from each floor to the street-sewers; the privies should be connected by proper drainage-pipes with the street-sewers; if possible there should be some regulation by which the halls and common accessories shall be kept clean, and these conveniences and examples will act as a constant incentive to cleanliness on the part of the tenants, and not only will their habits of cleanliness and their health be improved but their self-respect will be increased and their moral status elevated.

(*d.*) *Basements and Cellars.*—These apartment are often damp, badly drained, and imperfectly ventilated. The rooms immediately over them are consequently damp and unwholesome, especially when the soil is composed of refuse matter.

(*e.*) *Water-supply.*—The supply of pure water is often wanting or insufficient. Wherever this is the case tenants are not as cleanly in their persons and apartments.

(*f.*) *Drainage.*—This is still more frequently wanting or insufficient, and the evils arising therefrom are very serious. Drainage supplies the only efficient means for the romoval of house-slops and the contents of privies. In all tenements the privies should be properly connected with sewers by means of well-trapped drain-pipes, and each floor should so be supplied with pipes of sufficient caliber for the transmission of ordinary house-slops.

(*g.*) *House-slops and Garbage.*—A special source of insalubrity is the disposition of house-slops and garbage. In the greater part of the district lying east of First Avenue house-slops are thrown into the gutters, and

the garbage is to a greater or less extent thrown into the streets. Thus the streets and gutters become filled with decaying matter, the stench arising from which on a hot day becomes almost insufferable. There are about forty garbage-boxes in use in the district; and these afford but slight advantages over the more slovenly method of throwing the garbage into the streets. The boxes themselves are never thoroughly cleaned, and of course the refuse furthest advanced toward decay remains in the boxes, while the boards of which the boxes are composed and the ground beneath are saturated with liquids that flow from the garbage. The use of barrels as receptacles for garbage is now very general, and as the barrels are left in the street only a short time, are often emptied and are kept dry; this method is perhaps as little open to objections as any that can be devised.

(*h.*) *Privies.*—In that part of the district occupied by a tenant-population the privies are frequently not connected with the sewers, and consequently cannot be kept in good condition. Even when recently cleaned they are very offensive; but when they are filled, or left to overflow, as is sometimes the case, the stench becomes almost intolerable. When these privies are situated between front and rear tenements the nuisance reaches its maximum intensity, for occasionally all the privies used by from one hundred to one hundred and fifty persons are situated in one small court between a front and a rear house. The obvious remedy for this nuisance would be to have all privies connected by properly-trapped drain-pipes with the street sewers.

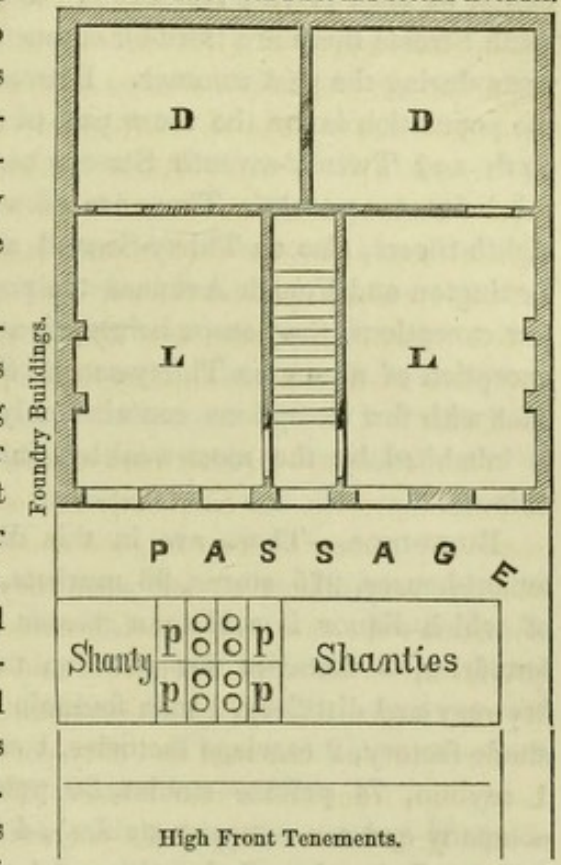
(*j.*) *Nuisances.*—Under this head may be included nuisances not otherwise referred to in the same square, and cases in which the nuisance is outside of and more or less distant from the square under consideration. In at least one case a stable is a cause of insalubrity affecting the square within which it is situated as well as contiguous squares. The foul emanations from gas-houses and from fat-boiling establishments are examples of neighboring nuisances. However, these are not to be found alone in this district. An insalubrious square is itself a cause of insalubrity to squares lying contiguous thereto.

(*k.*) *Rear Buildings.*—Rear buildings, of whatever character, by obstructing external ventilation, act prejudicially to the health of those inhabiting the section so obstructed. If these buildings are inhabited, overcrowding is superadded to the evils of defective ventilation. In some cases these buildings become insalubrious from the use to which they are appropriated, as when they are made storehouses of hides and fat, or are used as butcheries with cattle-yards attached, examples of which may be found in the squares included by First and Second Avenues, Twenty-

seventh and Twenty-eighth Streets; Second and Third Avenues, Twenty-eighth and Twenty-ninth Streets.

To illustrate the relation which the conditions above referred to sustain to the prevalence of typhus fever in such localities, the following abstract is here introduced respecting the disease found in my inspection of the rear tenant-house that is shown in this diagram:

Fever-Nests between First and Second Avenues.



"At No. — East Twenty-eighth Street, rear, found 7 cases of typhus at various visits during the summer. The total number of persons residing in this house at time of last visit was 21; number of families, 8. The house is 21 × 25 feet, is closely hemmed in, and can be reached only through a narrow and filthy alley. Privies and sheds fill the space between this and the tenant-house in front. Number of inhabitants in front is 50. Though the introduction of infection from another house appears to have started the fever in this house, local crowding and filth have furnished the soil to perpetuate it here. The external ventilation of this sickly quarter is as bad as that of the crowded and dingy domiciles themselves."

Inhabitants.—That portion of the district lying east of Second Avenue, with the exception of both sides of Thirtieth Street, is inhabited almost exclusively by the laboring class, and as a rule by the lowest grade of that class. The inhabitants, with the exception mentioned, are almost entirely Irish and of Irish descent. All the avenues, with the exception of Lexington, Madison, and Fifth Avenues, are inhabited by the laboring class; the inhabitants of First and part of Second Avenue belong to the lower, and those of the other avenues to the better grade of this class.

Between Second and Third Avenues the population is mixed, the domiciles ranging from third-class tenements to very good private residences. The private houses are on the south side of Twenty-seventh Street, and on Thirtieth, Thirty-first, Thirty-second, and Thirty-third Streets. The greater part of the houses on the four last-named streets

are private houses or first-class tenements, that is, tenements occupied by not more than one family to each floor, and are as well kept in every particular as most private residences. Between Twenty-eighth and Twenty-ninth Streets there are third-class tenements that have been prolific fever-nests during the past summer. Between Third and Lexington Avenues the population is for the most part of the better class. Between Twenty-sixth and Twenty-seventh Streets near Third Avenue, there are some third-class tenements. There are a few second-class tenements on Twenty-eighth Street, also on Thirty-Second and Thirty-third Streets. Between Lexington and Fourth Avenues the population is of the better class with few exceptions, the houses being private or first-class tenements, with the exception of a row on Thirty-second Street. The remainder of the district with few exceptions contains only first-class private residences, and is inhabited by the most wealthy, intelligent, and respectable class of citizens.

Buildings.—There are in this district 1,245 private dwellings, 768 tenant-houses, 275 stores, 36 markets, 81 groceries (in all or nearly all of which liquor is sold to a greater or less extent), 68 liquor stores, 3 foundries, 3 factories for planing, mouldings, etc., 1 gin distillery, 1 brewery and distillery, 1 soda fountain factory, 1 piano factory, 1 window shade factory, 2 carriage factories, 1 car factory, 6 hotels, 1 police station, 1 asylum, 74 private stables, 30 public stables (including livery, stage company and car company stables), 4 butcheries, 2 store-houses for hides and fat, 7 churches, 3 chapels, and 1 ward school.

The general character of the private dwellings can only be stated. East of Lexington Avenue about one-half are nearly new, with the modern improvements; the other half are older structures, and indifferent in their surroundings and internal arrangements. West of Lexington Avenue the private dwellings are almost without exception first-class structures, and are unexceptionable in their surroundings and internal arrangements. A little more than four-sevenths of the dwellings are private dwellings. Nearly three-sevenths of the dwellings are tenant-houses. In the record of Sanitary Inquiry tenant-houses are divided into three classes, which are also designated on the accompanying maps. These classes are defined as follows :—*Class* 1st. Houses well built, with the modern improvements, occupied in general by one family to each floor, and in all their apartments and surroundings as well kept as neat private houses, save that they are generally in more crowded and less desirable districts. *Class* 2d. Under this class is included the great majority of tenant-houses, only the very best and the very worst being included under the first and third classes. *Class* 3d. Houses inhabited by the poorest, most filthy,

wretched, and degraded class, in bad state of repair, very filthy within, and usually with filthy pestilential surroundings.

A description that will apply to the worst class of these tenements will be found under the heading on squares. They are located almost exclusively in the eastern part of the district; and in addition to the other defect referred to, they are badly crowded, the cubic air-space for each individual varying by day from 500 or 600 to 1,000 or 1,200 feet; and by night in the dormitories from 200 to 400 feet. As we pass from the third through the second to the first class all these conditions gradually change for the better, until in the first-class tenant-house the principal objection to be urged is that the population is crowded. The above division of tenant-houses would seem to be essential to a proper understanding of the subject; for the difference in sanitary condition between what are described as third and as first-class tenant-houses, is very much greater than that between the first-class tenant-houses and the best private dwellings.

The rum-holes are about 70 in number, and in the greater portion of them no especial regard is paid to cleanliness and order. Their deleterious influence is more noticeable, however, in their indirect bearing on the families and persons of those who frequent them than in any thing that appears about the liquor stores themselves. These grogshops are most numerous in the most degraded and overcrowded districts.

The groceries, markets, and stores are enumerated above. Uncleanliness in markets and groceries, and the sale of unwholesome meats and stale vegetables, must unfavorably affect the health of the districts in which they are situated; but facts elucidating these points have not been gathered in the course of this inspection.

There are four slaughter-houses in the district; and these with their surroundings may be considered as especial abominations, though none of them are as extensive nor as objectionable as others in the immediate neighborhood of the district. Connected with each of these slaughter-houses is a cattle-yard, that always is, and always must be, a nuisance to the neighborhood. The slaughter-house itself, even with the greatest care, can probably never be kept perfectly salubrious. But the greatest care is rarely if ever taken. Decaying animal matter always abounds, and offensive effluvia may always be observed. The herds of cattle that are driven through the streets to reach these slaughter-houses, are an additional nuisance. In addition to all this they must exert a demoralizing influence, especially on the children of the neighborhood, who are often curious witnesses of these disgusting scenes of blood and slaughter.

The private stables are for the most part kept in good condition. This

cannot be said of some of the public stables where a great number of horses are crowded together, and where the stables and their surroundings are often kept in a shockingly filthy condition. The Stage Company stables at the corner of Twenty-seventh Street and First Avenue, may be mentioned as an example of the stable nuisance. The inhabitants of the square in which these stables are located, complain of the exceedingly disagreeable odors sometimes coming from the direction of these stables; and even a cursory examination of the premises is sufficient to disclose the reason why, especially when the cellars which are the receptacles of the stable filth are being cleaned, as they occasionally are. At such times the effluvia in the neighborhood of these premises are especially obnoxious, and what is worse, in a sanitary point of view, they are usually borne in the direction of the Bellevue Hospital, which is situated just across the avenue and immediately in front.

The Bellevue Hospital is situated between First Avenue and the river, Twenty-sixth Street and Twenty-eighth Street, and contains 1,200 beds, the greater part of which are usually occupied. When first built, the hospital was well located, as that portion of the city was then uninhabited, but now the surrounding district is densely populated, and stables, slaughter-houses, and factories abound in that neighborhood. The influence of the surrounding district cannot but be deleterious to the hospital, while, on the other hand, the close proximity of a large hospital injuriously affects the densely-populated district in which it is located. Until quite recently this hospital has been the most prolific fever-nest in the district, if not in the whole city; for not only were cases of typhus fever brought here for treatment, but from these cases the fever was disseminated throughout the hospital, proving fatal to patients that otherwise might not have been exposed to the disease, and to the resident physicians and surgeons of the hospital. Now, however, the hospital has been relieved of these cases by the establishment of a fever-hospital on Blackwell's Island, and its sanitary condition is correspondingly improved. In general supervision, cleanliness of wards, and ordinary hygienic measures, there seems now to be no especial call for change or improvement.

There are six churches, three chapels, one ward school, and one asylum in the district, all of which, as far as known, are in good sanitary condition.

There are two houses for the storage of hides and fat, which are apparently kept in good condition. As nuisances these would seem to be overshadowed by the slaughter-houses of which they are the adjuncts.

On the shore above Twenty-eighth Street the space is principally

occupied by lumber-yards, all of which are in good sanitary condition. The vacant lots are all in good sanitary condition.

The sewerage is generally good. Where deficiencies exist in the better portions of the district, there are usually private sewers connecting the houses with sewers in adjacent streets. Thirty-first and Thirty-second Streets east of Second Avenue are not sewered, though sewers are here badly needed. Accompanying this report is a map showing the sewerage of the district.*

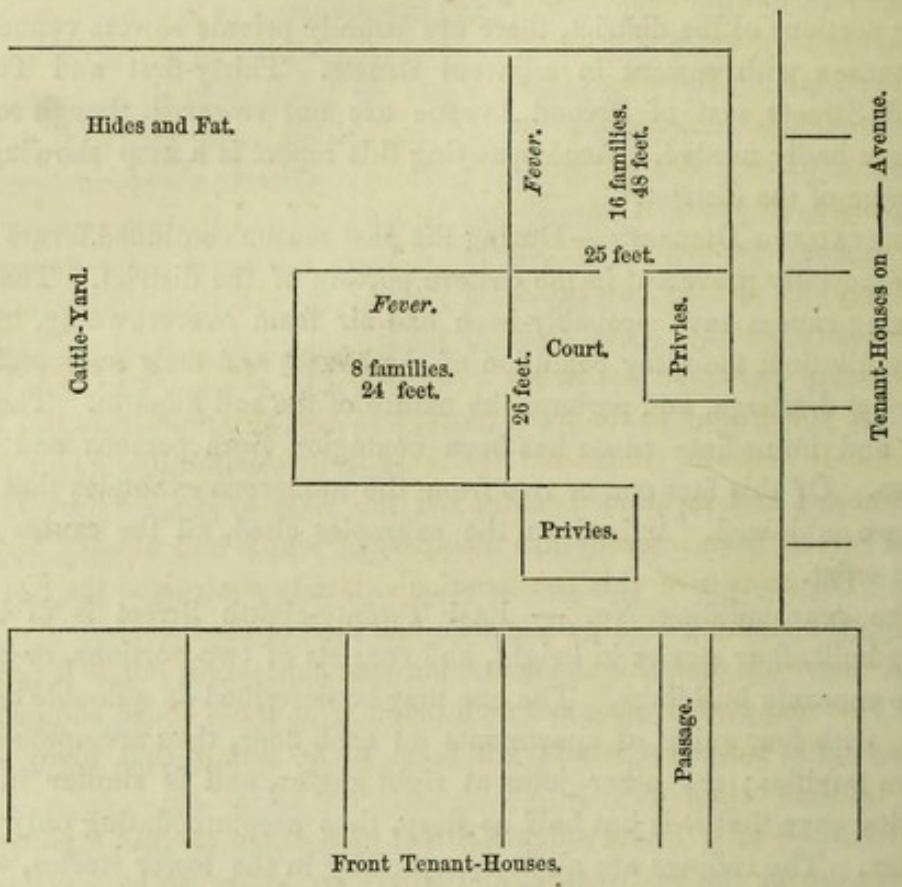
Prevailing Diseases.—During the past season continued fevers have been especially prevalent in the eastern portion of the district. The predisposing causes have probably been bad air from overcrowding, imperfect ventilation, the filthy condition of the houses and their surroundings, imperfect drainage, and perhaps the nature of the soil filled in. The efficient and immediate cause has been contagion from persons and from fomites. Of this fact one or two from the numerous examples that offer are here subjoined. Indeed, in the examples cited, all the causes mentioned exist.

The rear building No. — East Twenty-eighth Street is of brick, poorly built, four stories in height, and consists of two portions, or rather of two separate buildings. The one may be described as a double tenant-house, with four suites of apartments on each floor, thus accommodating sixteen families; the other joins at right angles, and is similar in construction save that it is but half as deep, thus accommodating only eight families. The ceilings are all low, especially in the lower stories, which are particularly damp and unwholesome. In front of the building is a narrow court and alley-way. The court contains the privies for the accommodation of all the tenants, more than 100 in number; while between this court and the front houses there are other privies for the accommodation of those inhabiting the front houses. The external ventilation at the front and one side is much obstructed, owing to the close proximity of other buildings; at the other side and in the rear the obstruction is not quite as great, though even here it is bad enough.

Previous to the riots in the summer of 1863, this building was inhabited by negroes; but during the riots they were expelled by the mob, and after some slight repairs the building was reoccupied by the lower class of whites. There is generally a large percentage of sickness in this house, especially on the lower floor, where the inhabitants are if possible

* As the Inspector's map has not been engraved, the reader is referred to the large map at the beginning of this volume.—Editor.

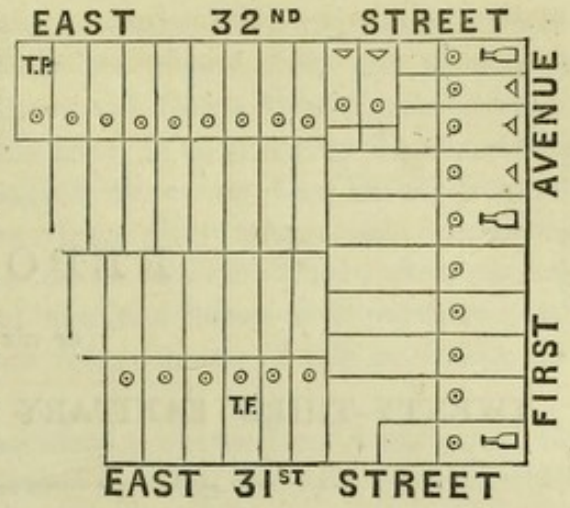
more squalid and cachectic than in other portions of the building. This diagram presents the ground-plan of this fever-nest:



Plan of the rear cul-de-sac where the fever occurred.

The first case of typhus fever that was observed here during the past season occurred in March. From this patient, a girl 18 years of age, the disease was contracted by two younger girls, her sisters, and also by another member of the family. From these a woman in the adjoining room contracted the fever, which was in turn communicated to her husband and four children. Still other cases occurred in this house, and in the immediate neighborhood, that probably had their origin from the cases above mentioned. The patient first referred to contracted the fever by visiting at No. — East Thirty-first Street, a description of which with an account of the cases occurring there is subjoined.

No. — East Thirty-first Street is a single tenant-house only 16 or 17 feet in width, and 4 stories in height, accommodating 8 families. In the size and arrangement of the apartments this house is like many others in the district. The external ventilation is good but the internal ventilation is deficient. The street is not sewered, and the surroundings



are usually unwholesome. The first case of typhus fever observed in this house was in the back room of the upper story, and occurred in March last. The plan of the house precludes ventilation of bedrooms. From this patient, a young man 18 years of age, the disease was contracted by the father, and in turn by two brothers and two sisters. The first-mentioned patient and his father died. A young man in the front room, and also two women in the room immediately beneath, contracted the fever from this family. The young man whom I first mentioned contracted the fever at No. — East Thirty-second Street, from a family five members of which had already had the fever. The mother of this last-mentioned family contracted the fever by washing the clothing of a patient who had died of the fever.

Further back than this the contagion was not traced, nor is it possible to say how many other cases had their origin from those above enumerated. However, the inference would not seem to be unfair that many other cases did thus originate.

At No. — East Twenty-eighth Street nine or ten cases of typhus fever occurred during the past season, and others are known to have originated from these. Several of these patients died. The house is a rear tenement, one suite of apartments deep, two in width, and four stories in height; is poorly built, and in bad state of repair. The stench arising from these depositaries of filth is bad enough at all times, but during the warm season it becomes almost intolerable. The tenants occupying the lower floors are often obliged to keep their windows closed as a protection against these offensive odors, thus depriving themselves of even the limited ventilation they might otherwise obtain.

The exanthematous fevers have also prevailed during the past season, though not to an unusual extent. The same may be said of the diseases of children and of the whole class of diseases that take their rise from local and personal uncleanliness, bad ventilation, bad personal habits, imperfect ventilation, &c.

Several cases of imported typhus have been under observation, but they were immediately sent to hospital, and no other cases have been traced from these.

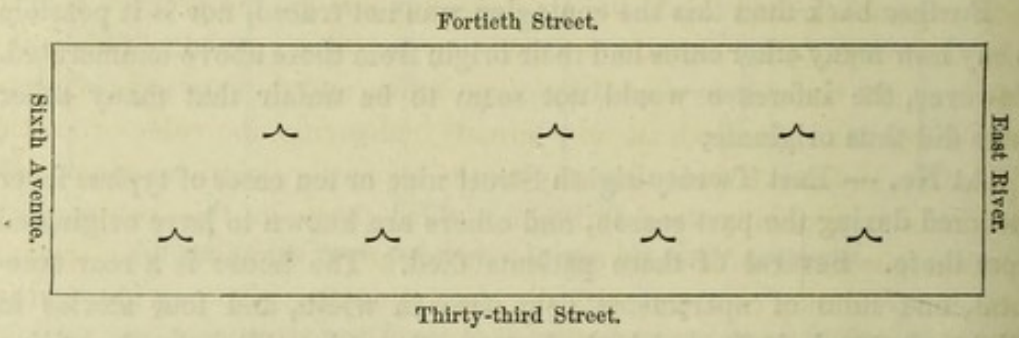
REPORT

OF THE

TWENTY-THIRD SANITARY INSPECTION DISTRICT.

ELLSWORTH ELIOT, M.D.,
Sanitary Inspector.

BOUNDARIES.—*North by Fortieth Street, east by the East River, south by Thirty-third Street, and west by the Sixth Avenue.*



TOPOGRAPHY, *with some matters relating thereto.*—That portion of the Twenty-first Ward situated between Thirty-third and Fortieth Streets, Sixth Avenue and East River, which the Council of Hygiene and Public Health designate as the Twenty-third District, is generally considered the healthiest locality in the city. Within its limits are the principal part of Murray Hill in the western and middle sections; Dutch Hill in the northeastern; and Kipp's Bay in the southeastern; the first two named attaining an elevation of from thirty-five to seventy-five feet above high-water mark, while most of the ground adjacent to the waters of the bay is sufficiently elevated and sloping to admit perfect sewerage. Traversed by streets which extend from river to river in one direction, and by the avenues at right angles to them in the other, the freest circulation of air is permitted, and the southwestern, southern, and southeastern slope of much of its surface gives the fullest exposure to the sun. Healthful as these influences

are, they are partially counteracted by disagreeable and noxious atmospheric contaminations wafted from the bone-boiling and fat-melting establishments at Thirty-ninth Street and North River in one direction, and at Forty-fifth Street and East River in another; by the emanations from the manure-heap at Thirty-eighth Street and East River; from the open outlets of the street sewers; from filthy streets and overflowing privies; from large and numerous droves of swine which, while passing, completely fill the streets, and put men and horses to inconvenience and sometimes in jeopardy; and from refuse matter of infinite variety, and in every stage of decomposition.

The southeastern part of the district, on the First Avenue and the ground adjoining, has been recovered from the river, the water of which penetrates to the cellars when the tide is high.

The square lying east of First Avenue between Thirty-third and Thirty-fourth Streets is not completed. During the past summer it was used for a dumping ground for refuse matter from factories, from the streets, and from every other source where a load could be obtained which could not otherwise be profitably disposed of. Decomposing animal and vegetable matter made the air sickening, and did not promise well for the salubrity of the habitations which may be there erected. This valuable ground belongs to a wealthy corporation, and the city pays six cents for every load dumped, thereby greatly enhancing the value of private property, and at the same time paying the owner for the transaction. The business is generally done through a third party in this manner: A person purchases of the owner the privilege of dumping for a specified amount; he then contracts with the city authorities, who pay him a stipulated sum for each load. My informant said it "paid handsomely."

As load after load is dumped, large numbers of women and children contend for bits of coal and wood, old clothes, rags, paper, and other material of use to them. How many causes of disease are thus exposed and diffused it is impossible to ascertain. The row of tenant-houses on the western side of the First Avenue, which are the nearest residences, has an ignoble reputation for insalubrity.

Formation of the Ground, Soil, etc.—Different varieties of gneiss formerly appeared in many spots above the surface, and a considerable number of buildings rest upon this foundation, the rock being generally but slightly covered. Swamps and brooks once existed, of which scarcely a trace remains. Old maps and pictures show irregularities of surface differing greatly from the present grade. The high places have been levelled, and the low places filled to afford facilities for travellers and sewerage. One fact of importance in this connection has come to my knowledge:

Within the memory of many people, physicians and others, intermittent fever was a very prevalent disease among the residents of Murray Hill. This has ceased to exist unless imported; a result ascribed to the construction of the sewers.

The soil is clayey, tenacious, compact, and sometimes gravelly, here and there exhibiting the formation called "hard-pan," of unusual thickness, and very difficult to dig. In its structure are found fragments of all the rocks of the Hudson River valley, and the boulders were more numerous and larger than in any other portion of the island, the neighborhood of Corlaer's Hook excepted.

Street-cleaning.—Sidewalks: their encumbrances, and other matters pertaining to these subjects, etc.—As the grade in almost every street ascends or descends upon almost every block, unusual facilities are afforded for cleaning. There is no crowding for business purposes, such as necessarily exists in some of our thoroughfares and in the neighborhood of markets, requiring the constant use of the shovel and broom to remove the filth. The trap-block pavement has been laid in many of the streets, which can be kept nearly as free from dirt as the sidewalk. Still there is not a block in the district which the city properly cleans. It frequently happens that a gang of men sweep the thickest of the dirt into piles; the cart does not follow to remove it until a day or more afterwards. Meanwhile it is scattered more or less by the wind, by wheels, and animals. At length a portion is taken away, and the street is soon as filthy as ever. In dry and windy weather the dust, composed of pulverized animal excrement and other irritating substances, rises in suffocating clouds, causing not only great inconvenience to persons in the street, but penetrating the houses and soiling every thing therein. In wet weather the pedestrians must carefully select a place to cross, and then use the utmost precaution to prevent slipping and falling. In winter the snow and ice are allowed to lie in heaps, filling the gutters, so as to turn the water in melting weather upon the sidewalks to freeze there.

This condition of the streets has compelled the citizens to resort to private enterprise. Portions of many of them are swept every morning, and on Saturday afternoons. The snow is levelled; the gutters are kept opened; the sidewalks are cleaned; the sprinkling cart is unknown, for a searching wind finds no dust. The expense is defrayed by the voluntary payment of one dollar a month for each house, and a smaller amount would suffice if all contributed, and there were no vacant lots. This plan has been followed for nearly three years in West Thirty-sixth Street between Fifth and Sixth Avenues, under the almost daily observation of the undersigned, and has given so much satisfaction that the example has

been successfully imitated in other localities. The cleanliness excites the admiration of all non-resident observers, and applications are constantly made to the person having the matter in hand to extend his ministrations to the streets where they reside. One great source of filth in the streets is connected with the manure heap. This feature of the district, before referred to, is situated between Thirty-eighth and Thirty-ninth Streets, First Avenue and East River. Large portions of the squares adjoining are also used for the same purpose. Hundreds of loads of manure are daily brought from the stables in different parts of the city; putrefaction is excited as much as possible in the constantly-increasing heap, and at the proper season the compost is shipped for use in the country. The carts which gather the material are generally small and loosely constructed. Upon them the manure is piled until no more can be retained. As the driver proceeds to headquarters, the jolting shakes off no small portion, leaving his track wherever he goes. A single cart load fouls a street just cleaned, and a constant procession of them makes cleanliness impossible.

The grocers, oystermen, and other dealers, throw their refuse into the streets with impunity. Their premises are frequently marked by perished vegetables, rotten fruit, and oyster shells before their doors. As early as the year 1656, when the population was about one thousand, the outskirts of the city, in the vicinity of Wall Street, and beyond that line was a wilderness, "the burgomasters enacted orders against casting filth into the streets." If in those days there existed a necessity for such orders, in our time the population, increased nearly a thousand fold in number, and greatly in density, should make such orders imperative.

The sidewalks should receive more attention than is now bestowed upon them. In many instances they correspond to the palatial residences before which they are placed. One, two, or three large flags cover the entire surface; and for blocks there is no unevenness which can prevent a sure foothold, but there are many places where irregularity of surface renders walking a guarded process. The paver will relay a portion and leave an edge several inches above the adjoining flags, against which the foot strikes, and sprains and even broken bones are the result. Occasionally for weeks the builder takes possession of the sidewalk and the contiguous side of the street, which compels the pedestrian to betake himself to the carriage-way, or to the other side, if this be not in the same condition. Remonstrance is useless. The complainant is told, with a smile partially suppressed, "to take his time and go round."

It is the practice to place garbage-boxes and ash-barrels upon the sidewalk, and their contents, the accumulation of days and perhaps weeks,

are often of a character to infect the atmosphere for a long distance. These boxes are constructed of wood, and placed in the situation intended, where they remain until worn out, knocked to pieces, and stolen for fire. A peculiarity in the construction of one of them deserves a passing notice. The lower part is filled with heavy stones, above which, perhaps fifteen inches from the bottom, is the floor. Thus made, it is immovable; but the floor not being tight, the stony foundation is the receptacle for nearly all the liquid filth. As a rule, garbage-boxes are far from being tight, as the dirt in proximity indicates. They are frequently filled to overflowing, and when the contents are removed it is done incompletely.

If in every residence proper metallic receptacles were provided for solid and liquid refuse; if it were made contrary to law to place them upon the sidewalks, but left to the ash-men to remove, clean, and return, the cleanliness, comfort, and health of the city would be increased to a wonderful extent.

The watering-troughs constitute another encumbrance to the sidewalks, and, as present constructed, they are the centres of dampness, stagnant water, mud, and filth.

Inhabitants and Occupations.—The lower floors of the buildings on the Sixth, Third, Second, and First Avenues, are used as stores, and families usually of foreign extraction occupy the floors above. West from Third Avenue are the residences of the wealthy, unsurpassed in the city. East from this avenue tenant-houses predominate, inhabited chiefly by people of foreign birth. One locality in the northeastern section is given up to shanties, the occupants being squatters, also born abroad. The eastern limit of Dutch Hill (for so this place is called) is a precipice thirty feet or more in height, without any protection from falling; its almost perpendicular side corresponds to the line of First Avenue, and on its brink terminate abruptly East Thirty-ninth and East Fortieth Streets. These people find employment in the quarry and manure heap near their homes. They possess cows, swine, goats, and fowls, in large numbers. The women, boys, and some of the men, are *volunteer assistants to the city inspector*. They may be daily seen with their carts drawn by themselves and their dogs; or, if fortune has more signally favored them, a rickety wagon, drawn by a decrepit horse with harness of somewhat primitive construction, facilitates their labors. Going from house to house they ransack the ash barrels, and beg the swill and other kitchen refuse to supply food for their cows, pigs, and goats. It is said that they sometimes steal. Here it may be mentioned that the cow's milk from this source commands a high price because furnished from a single cow; the purchaser not considering how the animal is fed.

Some facts in regard to the construction of dwellings.—In the construction of residences, whether for single families or on the tenement plan, little attention is paid to the health of the occupants. Any thing which contributes to show is not neglected, while parts not exposed to inspection, parts which can be covered up, are slighted. As an illustration of this statement, the plumbing of a house erected in 1857, at a cost of $30,000, was constructed without suitable traps, so that there was no obstacle to the emanations from the sink and water-closet. A child sickened and died. The other children and women of the house did not escape serious sickness; the symptoms in each case being those which characterized the National Hotel disease at Washington—vomiting, purging, and great prostration. At no inconsiderable expense and trouble the proper additions were made to the waste-pipes, and that plague was stayed.

In some places the grade of the street is so far above the original level that no excavation is needed, and it may be necessary to fill in. Speculators are not particular about the materials used. Most, if not all, of the English basement houses have no cellars. The foundations are laid, and at the proper depth, the lowest floor several feet from the ground. Here is an extensive vacant space for air, it may be foul and damp, the sole escape for which is through the cracks of the floor, or along the course of the water or waste-pipes to the apartments above. Is it to be wondered at that inexplicable types of fever prevail, or that some houses are regarded as unhealthy?

The sewer of a house is a concealed matter. In several houses constructed as above described, wet earth was thrown up to make the elevation sufficient, and upon it in frosty weather a brick sewer was built. The warmth of spring produced an upheaval, the bricks separated, the rats in crowds took possession, enlarging the openings, and the house was filled with such odors as might be expected. The floors were torn up, for there was no other way of reaching the sewer, which was removed, and another substituted. I am inclined to the belief that there is scarcely a house in which poisonous air does not escape from the gas, furnace, or soil pipes; and as these are generally covered, it is very difficult to find the leak; and when discovered, the defect, which might easily have been prevented, is remedied at much inconvenience. To save expense, it has been the custom to make a single connection with the street sewer for several buildings. The results of an obstruction, partial or complete, near the outlet, are experienced in all, and before it is removed the occupants may be subjected to a vitiated atmosphere from an unknown source for days and even weeks. It follows that every building should have its drain-pipe separate; through which should flow not only all the waste water and

excrement, but the rain falling upon the roof should be conducted through the leader thereto, and not allowed to flow over the sidewalk, as is frequently the case, making it wet in the warm seasons, icy in winter, and slippery in all stormy weather.

The tenant-houses of my district are built in the usual fashion, which is so well understood that a particular description is needless. People cannot live in them without impairing their health, and, perhaps, endangering their lives; and what is of equal importance, all their surroundings contribute to the development of depravity. Good air and cheerful apartments are as necessary to the formation of the moral character, as sunshine and proper soil to vegetation.

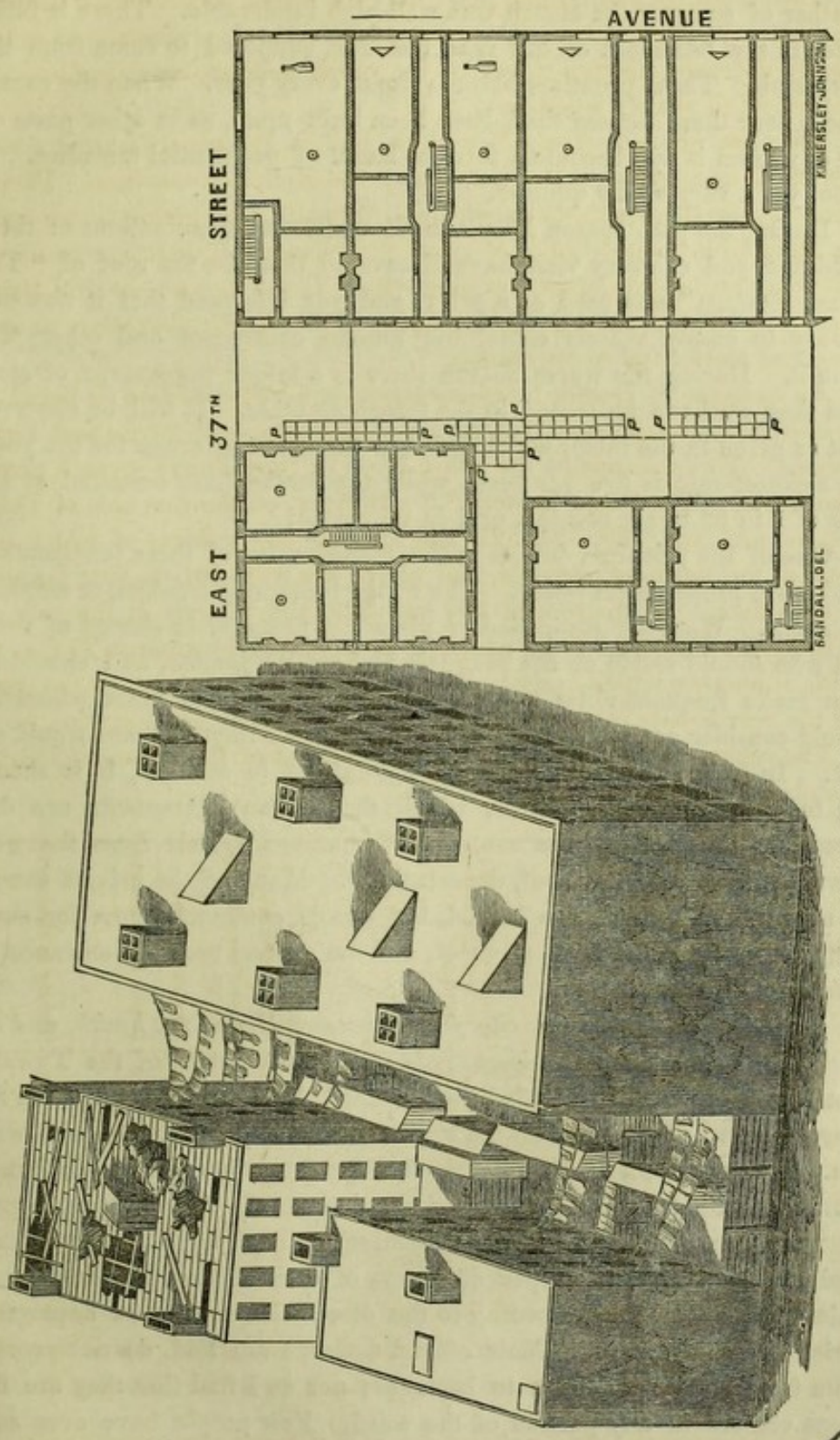
An example of crowded tenant-houses in a bad condition is found at the eastern foot of Murray Hill, corner of Thirty-seventh Street and Third Avenue. To its occupants the house No. 115 East Thirty-seventh Street is known as "The Great Eastern." * In front, on the east side of Third Avenue, are Nos. 523, 525, 527, and 529, the lower floors of which are occupied for business purposes, and above are from two to four families on each floor. In the rear of 527 and 529, and directly in the rear of "The Great Eastern," from which it is separated by an area 20 feet in width, is another tenant-house. The space intervening between the front and the rear houses is crowded with offensive and neglected privies.

The census of these tenant-houses, and of that of the house on Thirty-seventh Street, is as follows:

Street Number.	Number of families.	What stores and shops on first floor of these houses.	Number of inhabitants	Number under 10 years of age.	Number now sick.	Deaths in six months.	Number in basement.
No. 115 E. 37th St.	22	Second-hand Clothing and Tailoring in basement.	90	31	3	1	8
" 523 3d Avenue	8	Liquor store on lower floor.	30	11	3		
" 525 "	17	Shoe store on lower floor.	65	28	3	3	
" 527 "	8	Liquor store on lower floor.	39	13	1	1	
" 529 "	8	Plumber and metal roofer on lower floor.	40	14	2		
" 527 Rear	4		25	15	2	1	Water in cellar.
" 529 "	5		23	11	1		2
Total	72		312	123	15	6	10

A large part of the ground between the buildings is devoted to the privies, a cloacal sea of indefinite extent, the contents of which are discernible between the dilapidated planks which cover it. During the hot

* See the ground-plan and a bird's-eye view of these houses upon opposite page.



THE "GREAT EASTERN."—FOOT OF MURRAY HILL.

THE ROYAL SANITARY INSTITUTE LIBRARY

weather of summer the stench was well-nigh intolerable. There is filthy water in the basement of 527 rear building, supposed to come from the privy sink. These premises become worse every year. When the vacant spaces near these houses shall have been built upon, as in other parts of the city, then it will become a favorite haunt of pestilential maladies. It is not yet a very sickly quarter.

During the past season I have made numerous examinations of these buildings, and at every visit have discovered that the flat roof of "The Great Eastern" was used as a privy, and was informed that it was customary to empty vessels containing human excrement and other filth upon it. During the warm season there is a larger percentage of sickness than we have presented in the foregoing table. It will be observed that as given in the table, which is below the actual average for the year, the sickness-rate is five per cent., while the deaths have occurred at the rate of 1 in 52 in six months, or 1 in 26 yearly.

One of the principal defects in the management of these tenements is the lack of proper supervision. The owner frequently sub-lets, or employs an agent. Were he compelled to place his property in charge of some one who should reside on the premises and act as janitor, and should he then make frequent visits to look after the interest of those whom he should consider as placed under his protection, an improvement would result. In going from one of these habitations to another, it is shocking to observe the manner in which the human excrements are disposed of. Some throw the contents of chamber vessels from the windows; others, near the roof, deposit there. Many of the privies cannot be approached. Some are locked, but one is commonly open for emptying vessels, and the floor, the seat, and the ground near the entrance, is covered with excrement.

Special provision by the city for the preservation of the health, and the prevention of disease.—The immediate care of the health of the Twenty-first Ward, in which is included the Twenty-third District, is placed in the charge of two officials, called the health warden and assistant health warden. They receive a handsome remuneration for their services—in former years three dollars a day; now, perhaps, increased. The present incumbents are rumsellers; and if this avocation, pursued for a lengthy period, qualifies them for the proper discharge of their duties, they may justly claim competence, for, according to the directories, they have kept groggeries for many years. Their official duties, I am told, do not prevent them from a close attention to business; nor do I find that they are frequent visitors in any portion of the ward. Few people have ever seen them, and to many their existence is unknown.

REPORT

OF THE

TWENTY-FOURTH SANITARY INSPECTION DISTRICT.

ROBERT STEWART, M.D.,
Sanitary Inspector.

BOUNDARIES.—*This district is bounded on the north by the south side of Fiftieth Street, south by the north side of Fortieth Street, east by the west side of Sixth Avenue, and on the west by the Hudson River. The district comprises a southern section of the Twenty-second Ward.*

There are 11 streets and 6 avenues in this district. The number of squares with street boundaries is 68. There are 2,423 buildings in the district occupied as dwellings. In order to describe these as accurately as possible, I will divide them into three classes.

First Class.—Those occupied by one family. There are of this class 1,129; 387 of these are built of brick with brown-stone fronts, 442 brick with brick fronts, 300 wood with wooden fronts. The brown-stone and brick fronts are all first-class residences, but the wooden buildings are varied, ranging from the beautiful dwelling neatly painted and richly ornamented, to the first-class shanty. It was not my privilege to inspect many of these buildings, nevertheless, when the occupant was a tenant, I heard many complaints of defective sewerage and plumbing, overflowing privy vaults, etc., showing very clearly that what we call first-class residences would be none the less comfortable for a little attention from an honest "health warden" who was qualified to give advice on sanitary matters.

Second Class.—Those occupied by two or more families, commonly called "Tenant-Houses." There are of this class 1,126 buildings; 119 of these are on the rear of the lot, two buildings on one lot, 42 of these are constructed of brick with brown-stone fronts, 620 of brick with brick

fronts, 308 are wooden buildings; these are generally very poor houses, and it is not over stating the case to say, that they should all be presented as nuisances.

The tenant-houses of this district are built to accommodate two families on a floor. There are but few exceptions to this rule, the average number of families is six to a house. Generally, these houses are kept in a filthy condition by the occupants; the halls are miniature streets, and the same nuisances are found existing as in the streets, the swill-pail taking the place of the garbage-box, wet halls and stairs in lieu of muddy gutters.

The contents of the swill-pail is a mixture of swill, ashes, and the contents of the chamber-pot. The odor emitted from these vessels is of the most offensive and poisonous character. If the occupants sicken with any of the severe forms of acute diseases, death is almost the necessary consequence. It must be admitted that there are some exceptions to the above general statement; and I am happy to note the fact, for it only goes to prove that filth and stench are not a necessary consequence in a tenant-house. I have visited houses where every thing was found in the best order, and this, too, in houses of the same construction, division, and number of square feet to a family, as those that are most miserably kept. I do not wish the inference drawn that I maintain that tenant-houses are as a class well-constructed and ventilated; nevertheless I do maintain, that the differences which we meet with as regards cleanliness, are due in a great measure to the habits of the occupants. For instance, there is in West Forty-first Street between Ninth and Tenth Avenues (a miserably filthy block), a house built on 100 feet square of ground. This house has been occupied the past summer by 64 families—62 German and 2 Irish. I visited this house during the month of September; the people opened their apartments to me, and seemed proud to have them examined. I found the halls clean, no obstructions, no unpleasant odor, the rooms were tidy, and I found it pleasant to rest in them. There had not been a death during the summer, and but one or two cases of sickness, and that of a mild character.

Third Class.—All that class of dwellings scattered irregularly around, without reference to lot or to street boundaries, I call shanties. They are one story usually, with but one room, neither ceiled nor lined; some have a wooden floor, others none; in short, they are very uncomfortable looking affairs. There are of this class of buildings 156; Irish and German ragpickers and cinder gatherers are the occupants. These people are emphatically "squatters." The *New York Times* of November 21st, says: "It is estimated by those who are perfectly competent to judge, that there is a population of 20,000 on this island that pay neither rent for the dwell-

ings they occupy nor municipal taxes as holders of real estate. They comprise that portion of the population known as squatters. In one ward which we need not name, they combined a year or two ago in sufficient numbers to control the election for alderman and councilmen. We are not altogether sure that they cannot control the majority of votes in the same ward to-day."

There is no parallel to this state of things in the history of a civilized community calling itself a city. These 20,000 exempts, as we saw the other day, exercise by favor of the Common Council the right of free pasture for cows, goats, and pigs. The public pound has been voted a nuisance, the keepers thereof a double-distilled nuisance. Absolved from the duty of paying house-rent, relieved from the burdens of municipal taxation—so trying to the temper of freemen in all countries—this especially favored class of householders also claim the right of carrying on the pork and dairy business, at the expense of the municipality, and to the disadvantage of those who love cleanliness, quiet, and comfort.

Our exempted population moreover demand of us even more than this in the way of accommodation. The "freedom of the city" they hold to embrace not merely the privilege of living rent free, of paying no city taxes, and of feeding their pigs, cows, and goats in their neighbor's back yards, and on the common thoroughfare, but likewise the right of revising the general municipal surveys. Let any one sceptical on this point take a cursory glance say at Fifth Avenue, opposite Central Park, on that high ground which promises to be in a few years the most magnificent terrace on the continent, and he will find that the dwellings of the "exempt" population, at frequent intervals, hold possession of the public highway. At sundry points they take half the carriage road, the owners no doubt holding to the view that where a dung-cart can pass along, there is ample accommodation for any other species of vehicle.

We need hardly tell the owners of real property on this island, that the mere fact of this class being above the weakness of paying either rent or taxes, is by far the smallest part of the burden they impose upon the responsible citizens. The depreciation in the value of real property in the neighborhoods we speak of is beyond calculation, not merely from the fact that the grading, draining, causewaying, and paving in up-town districts is delayed by the free-tenement system, but from the still graver fact that in point of social order, obedience to the law, and peacable citizenship generally, the exempt districts bear an atrociously bad character.

Out of every seven squatter-tenements it can be shown that five are unlicensed groggeries, that on Sundays and other holidays they are the resort of the vilest and lowest characters of both sexes, and that they serve

the purpose of repositories for petty thievings from one end of the island to the other, besides being nurseries for juvenile criminals of a more dangerous class than those bred in the crowded haunts down town.

Such, in effect, is the testimony of an officer of long experience; and apart from the character of the witness, we are prepared from personal observation to give it full credit.

STORES.—There are 803 stores in this district; 141 of these are for the sale of liquor, most of the "gin-mill order."

MANUFACTORIES.—There are 96 manufacturing establishments in this district.

STABLES.—There are 132 stables in this district—117 private, and 15 livery stables. I found no cases of sickness that would be directly attributed to the stables. They were generally in good order.

SLAUGHTER-HOUSES.—There are 17 slaughter-houses. Two-thirds of these buildings are but poorly constructed for the purpose for which they are used, and as a consequence are not kept in good order. The drains in most instances lead into the street gutters instead of the sewer; this is the principal difficulty. In Forty-sixth Street, between Tenth and Eleventh Avenues, I found the most filthy one: it is built on the rear of the lot, the drainage is over the surface of the yard over the sidewalk into the street gutter, where the blood is mixed with water; it then runs two-thirds of the entire block before it finds its way into the inlet of the sewer. The children of the neighborhood play in this mixture. Cholera infantum has prevailed to an alarming extent in this neighborhood during the summer. There were 11 deaths during the hot months. There are 6 tripe, 3 sausage, and 2 bone-boiling establishments. I did not find any sickness that could be directly attributed to these establishments; but the people living in the immediate vicinity complained bitterly of the odor emitted from them, being compelled in the heat of summer to close their windows, heat being preferable to cool air ladened with fetid odor. How much of the sickness is to be indirectly attributed to these disgusting nuisances. is a subject that requires careful study.

The little children of the neighborhood gather around the doors of the slaughter-houses to witness the death of the animals; in this way they are early in life educated to habits of cruelty. They are rude and boisterous, showing very clearly that the cruel manner in which slaughtering of animals is effected in this city, has a bad effect on the morals of the community.

NUISANCES.—I found 47 places where very evident nuisances existed. They had all been the subject of complaints, but in every instance the complaints proved unavailing. I will note a few of them.

The block in Forty-seventh Street running from the Seventh Avenue to the Eighth Avenue, is in a very bad condition.

There is no sewer in the above. The houses are built of wood and are poorly constructed, being only a little in advance of the shanty variety. They are built on the natural surface without cellars, the yards being in almost every instance above the level of the street. The hydrants are in the yards, the waste water is drained over the surface, keeping the yards and street constantly wet. The street is the receptacle of the ashes, swill, and garbage of the houses, and is filthy and noisome. I found fever cases in seven houses in this block.

Broadway, from Forty-seventh to Forty-ninth Street, is not sewered; consequently the houses are, with but few exceptions, deprived of drainage. Some of them are from this reason in a sad condition.

The block of six houses on the west side of Broadway suffer the most. The natural slope of the land is toward the street, the descent is quite rapid. At the time of every rain the water fills the cellars and vaults of the privies, washing the contents of these into the yards. I found fever in two of these houses. The cellars along the entire length of both blocks have to be emptied by pumping after every rain.

I found fever cases in every locality where the surface is kept constantly wet.

Spreading of manure during the summer months is, in my opinion, a cause of fever. The blocks bounded on the north by Forty-sixth Street, south by Forty-fourth Street, east by Seventh Avenue, west by Ninth Avenue, are cultivated as vegetable gardens. The gardeners cultivating this ground are very industrious and thrifty men. They gather four crops a year. In order to do this, large quantities of fertilizing material must be used. This is collected from cow-stables, pig-pens, and I believe from the privy-vaults of the city. The odor emitted from this mixture as it lies decomposing is any thing but pleasant; but when the time comes to unpack this mass for the purpose of spreading it over the surface of the ground, the stench is intolerable. Those who are forced to inhale this are necessarily made sick. Nine of the families residing on the boundary of these gardens have suffered during the past summer with a severe type of fever, and this number would undoubtedly be greatly multiplied if the families living in this neighborhood were at home during the hot months.

The street gutters of the tenant-houses and stables were invariably found in a filthy condition. This is owing in part to the habits of the people and to their indifference to cleanliness, and partly to the bad construction of the gutters. The stones composing the floor of the gutters are irregular, one sunk below the level of the other—forming "traps for the solid

matters." This may work well in the sewer ten or fifteen feet below the open surface, but in the gutters it is undoubtedly a cause of disease. As long as these gutters remain in their present condition no amount of sweeping or washing will avail to thoroughly cleanse them.

The receiving-pens for the swine brought into the city are located at the foot of Forty-second Street and the North River. The pens were in the condition in which pig-stys are generally found. The manure collected from them constitutes the nuisance, and it is a serious one. It is thrown into an excavation near the street, at the end of the block; this pit is always full, a large quantity is allowed to accumulate before it is removed. The air is constantly filled with the noisome odor emitted from this decomposing mass; many and earnest were the complaints of the neighbors. This locality has been visited by an epidemic of fever of a severe type within the past two years, and in my opinion the manure-heap was the cause.

Adjoining this establishment toward the river is the slaughter-house of Mr. ———. This building is new and well-arranged for the business. During the killing season about one thousand hogs are slaughtered daily. I discovered nothing of an unpleasant nature about the working of this establishment until I visited the foot of West Forty-second Street (two blocks above). At this point there is a pier for the purpose of landing coal which extends out some two hundred feet into the river, and is elevated high above the water. I found the logs and cross beams of this fine structure much marred by being full of the offal from Mr. ———'s establishment. Instead of casting the refuse matter of the slaughter-house into the proper dock to be disposed of as directed by law, he saves the city this expense, and dumps it into the river direct. This would not matter much (for we are credibly informed that the city authorities take about the same trouble) if the tide did not take the viscera and small pigs up instead of down stream. Here we have another "trap for solid matters." This is in the immediate neighborhood of the Weehawken Ferry landing, consequently thousands of our citizens are daily exposed to the sickening odor emitted from decaying animal matter.

Swill-milk.—I will note but one stable; it is located in West Forty-fifth Street between the Ninth and Tenth Avenues. This milk-factory is built of wood in the shanty style; it measures twenty by eighty feet. Eighteen cows are stabled and milked in this establishment. The proprietor was so jealous of his rights that I was not permitted to examine the internal arrangement of the building or the condition of the cows. This building stands alone high above the level of the street, bounded on the west by high rocks, on the east by an empty lot, high in front and low

in the rear. The street in part is sewered but is not paved, and the surface of it is rendered very uneven by heaps of ashes. The stable has no connection with the street sewer, but is drained into the adjacent lot, on the east side, where the urine forms a large pool. The citizens protect themselves from the overflow of this by banking; a crevasse sometimes occurs, when the adjacent yards are overflowed and the privy vaults filled. The privy vaults of the houses in Forty-sixth Street, located in the rear of this stable, are filled with urine once in four weeks. At the time of your inspector's visit the vaults were full and the yards overflowed. The manure is all thrown out on the rocks on the west side of the stable. The fluid portion runs off the surface of the rocks for the distance of fifty feet down into the street. Some of the urine finds an outlet in this direction. In this way the street is kept wet, and is in a filthy condition.

Complaints have been regularly made against this establishment, but it continues to exist.

Remedial Measures.—Voluntary efforts may do something—should do much—toward the discovery and the application of the remedies for the causes of insalubrity that prevail in this inspection district. But the remedial power that is most needed is the power and presence of a thoroughly efficient sanitary police. The evils that I have described in previous pages of this report will not yield to the moral suasion of volunteered in quiry, inspection, or advice. In vain will be the sanitary inspector's re ports upon the causes of the fever, the dysentery, and the high sickness-ratio in his district, unless by such reporting the public conscience and pop ular intelligence are aroused to apply the strong arms of their power in the form of definite sanitary regulations, administered by competent minds. Probably there is no other portion of the city that presents greater incentives to popular effort to eliminate every cause and agency of insalubrity, but I fear that no amount of *voluntary* effort can save the district from evils both impending and now being suffered in this favored section of the city.

THE ROYAL SOCIETY OF HEALTH LIBRARY

Formerly

THE ROYAL SANITARY INSTITUTE LIBRARY

REPORT

OF TH

TWENTY-FIFTH SANITARY INSPECTION DISTRICT.

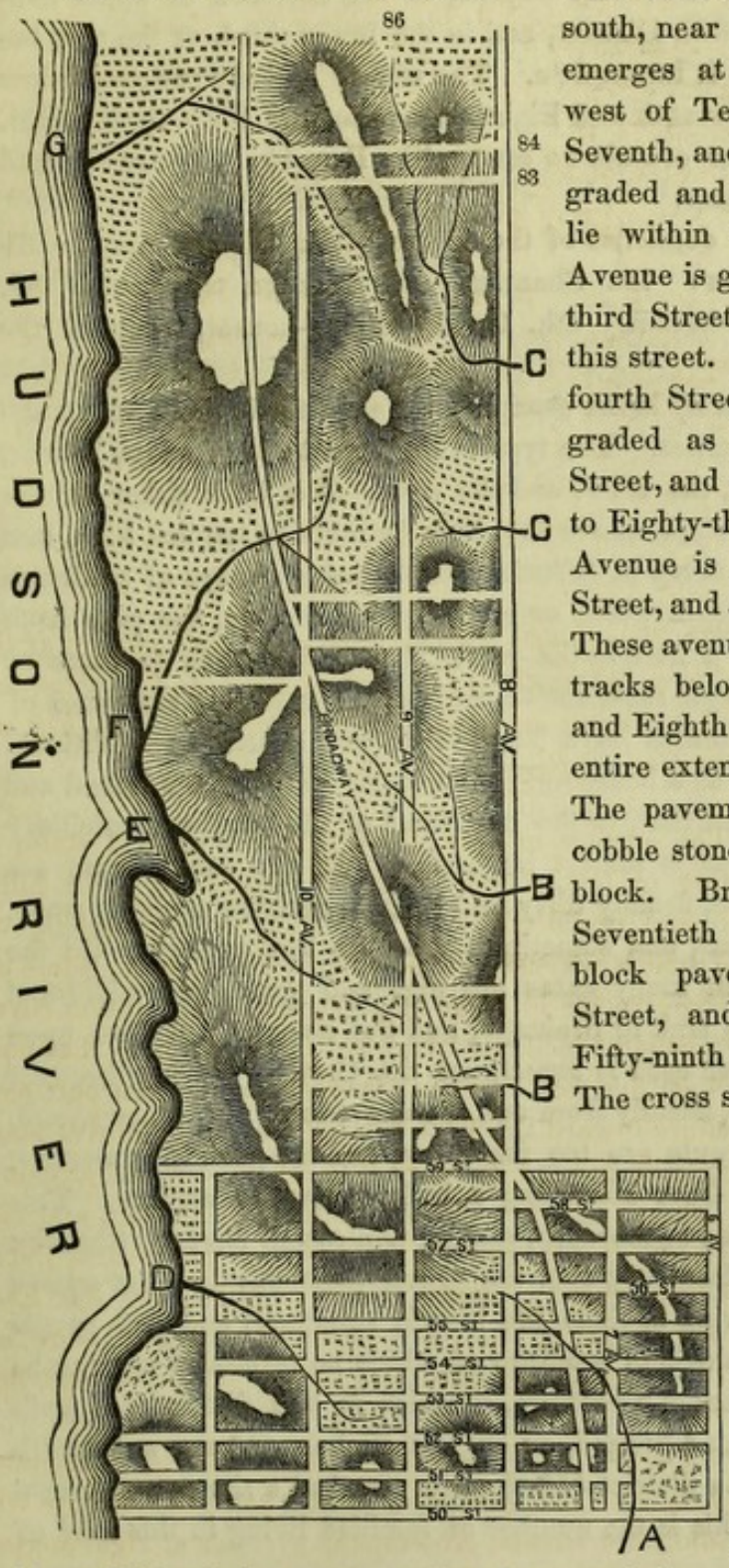
J. LEWIS SMITH, M.D.,
Sanitary Inspector.

BOUNDARIES.—*The Twenty-fifth District comprises that portion of the Twenty-second Ward bounded north by the Central Park and Eighty-sixth Street, east by the Sixth Avenue and the Central Park, south by Fiftieth Street, and west by the Hudson River.*

TOPOGRAPHY.—The surface of this district, in its natural state, is very uneven, consisting of low, marshy ground, alternating with hills, usually of small size, and produced by the elevation or outcropping of rock from the bed of gneiss which underlies the whole island. Some of these hills consist of bare rock; in other places, soil and vegetation cover the rock. There is a general inclination toward the Hudson of that portion of the district which lies west of Ninth Avenue, while that part east of Ninth Avenue inclines toward the East River. In the primitive state of the district the marshy ground gave rise to seven distinct streams, five of which (A, D, E, F, and G) emptied into the Hudson, and the remaining two (B, B, and C, C) crossing what is now the Central Park, and along the bed of the skating ponds, finally emptied into the East River. These streams, as far as they lay within this district, were all small, and some of them nearly or quite disappeared in protracted dry weather.

STREETS.—THEIR CONDITION.—There are in the district 5 avenues parallel with and equidistant from each other, and when graded there will be 35 parallel and equidistant streets, crossing the avenues at right angles. The district is also crossed diagonally by Broadway, or, as its suburban portion is termed, the Bloomingdale Road; the old highway of the island.

MAP OF TWENTY-FIFTH DISTRICT.



This enters the district on the south, near Seventh Avenue, and emerges at Eighty-sixth Street, west of Tenth Avenue. Sixth, Seventh, and Eighth Avenues are graded and paved so far as they lie within the district. Ninth Avenue is graded as far as Sixty-third Street, and partially above this street. It is paved to Fifty-fourth Street. Tenth Avenue is graded as far as Sevety-fourth Street, and is open but not graded to Eighty-third Street. Eleventh Avenue is graded to Fifty-ninth Street, and above that is not open. These avenues all contain railroad tracks below Fifty-ninth Street, and Eighth Avenue a track in its entire extent through the district. The pavement used is, in part, cobble stone, and in part the trap-block. Broadway is graded to Seventieth Street, paved with block pavement to Fifty-ninth Street, and macadamized from Fifty-ninth to Seventieth Street. The cross streets, from Fiftieth to Fifty-ninth, are all open, and graded with the exception of Fifty-first Street between Sixth and Seventh Avenues, and portions of Fifty-third, Fifty-fourth, and Fifty-eighth Streets, near the Hudson River. Above Fifty-ninth no street has been entirely opened except Eighty-sixth.

SEWERAGE.—This is entirely wanting in the northern or upper two-thirds of the Twenty-fifth District, and in the lower third, or the part below Sixtieth Street, it is incomplete. The streets entirely sewered below Sixtieth Street, are Seventh and Eighth Avenues, and Fifty-ninth Street. The other streets either contain no sewer, like Broadway, or are sewered only for limited distances.

DOMICILES.—The domiciles of the Twenty-fifth District may be divided into four classes: 1st. Shanties. 2d. Wooden tenements. 3d. Brick or stone tenant-houses. 4th. Good dwelling-houses, whatever the material.

Shanties.—The shanty is the cheapest and simplest domicile constructed in civilized communities. The typical shanty is built of rough boards, which form the floor, the sides, and the roof. It is built either on the ground, or but little raised above it. It is from six to ten feet high, and its ground area varies much in different cases; but is always of moderate extent. It contains no fireplace or chimney, but a stove, the pipe from which passes through a hole in the roof. It has from one to three or four windows, with single sash, each containing from four to six panes of small size. Some shanties have but one room; others an additional small apartment, used as a bedroom. The better shanties are lathed and plastered. It is evident that, to the occupants of the shanty, domiciliary and personal cleanliness is almost impossible. In one small room are found the family, chairs, usually dirty and broken, cooking utensils, stove, often a bed, a dog or cat, and sometimes more or less poultry. On the outside, by the door, in many cases are pigs and goats, and additional poultry. There is no sink or drainage, and the slops are thrown upon the ground. The water used is sometimes the Croton, which is brought to the shanties in pails, usually from one of the avenues. In other places, where the Croton hydrants are too far away, and the ground is marshy, the water is obtained from holes dug a little below the surface. This water often has a roiled appearance, and an unpleasant flavor. Shanties are usually built promiscuously over the ground, without the least regard to order. Families living in them are largely squatters, and such people of course select for residences localities of which no profitable use can be made by the proprietors. Therefore, shanties in this district are built mainly on rocky, elevated ground, or on lots sunken and too wet for tillage. There are in the district 552 shanties; and as a shanty accommodates but one family, this is the number of families living in this kind of domicile.

Wooden Tenements.—Next to shanties, in the classification of domi-

ciles, come wooden tenements. In determining what buildings should be placed in this class, we have regarded more the appearance and general character of the houses, than the number of families which they accommodate. The separation of wooden tenements from shanties on the one side, and the better class of dwellings on the other, is in a measure arbitrary. Some wooden tenements are but little removed from shanties, as regards both size and mode of construction; while others might, without much impropriety, be placed in the group of good private residences. Ordinarily, however, there is little danger of error in their classification. The wooden tenement in the Twenty-fifth District has usually two stories, but some have only one, some three, and a few four. It is built without cellar, and but little raised above the ground. It has a mortised frame, clap-boarded sides, a chimney, and shingled roof. It has no sewer connection or other drainage, and no gas or Croton pipes. The privies are in the rear, or in front, and also without drainage. The water used by the occupants is, in some localities, the Croton; in others, spring or well water. The house is heated by a stove, and the fluel used is coal, frequently partially burnt, and sifted from ashes obtained from hotels and private residences in the city. This is also the fluel used in shanties, and the shanties and wooden tenements are lighted by kerosene oil.

The ground area of the wooden tenement, like that of the shanty, is nearly square; sometimes the width, sometimes the depth excelling. The width and depth vary generally from twelve to twenty-five feet.

The number of families in the wooden tenement varies from one to as many as seven or eight, according to the size of the house. In 132 of these domiciles taken without selection, I find 312 families, which is probably not far from the average number. There are in the entire district 861 wooden tenements, containing, therefore, according to the above calculation, 2,035 families.

Brick Tenant-houses.—There are in the Twenty-fifth District 147 domiciles, built, with one exception, of brick, which, from their mode of construction, may be properly considered tenant-houses. In the exceptional case, the material is stone. There are some dwelling-houses which are built in part of brick and in part of wood. Whether these are classed with the brick or wooden tenements, depends upon which material is in excess, or whether the building resembles most in its appearance the one or the other kind of domicile.

Of these 147 tenant-houses 94 have four stories, 32 three stories, 19 two stories, and 2 one story.

The following table exhibits the water supply of these houses:

	No. of houses.
Croton obtained from hydrants in yard (front or rear),	24
" " " cellar or basement,	11
" " on the floors,	85
" " elsewhere; no water on the lot,	15
Spring water used,	3
Water-supply not stated in the records,	9
	147

House drainage.

None, or into gutter or to surface of street,	44
Drained into sewer,	80
" " contiguous sunken lots,	14
Not ascertained,	9
	147

PRIVIES.

Location.		*Drainage.*	
In front of house,	16	None,	61
" rear "	116	Drained into sewer,	77
" cellar "	1	" " sunken lots,	2
None (water-closets in house),	7	Placed over the Hudson,	3
Not ascertained,	7	Not ascertained,	4
	147		147

Cellars.

None,	27
Cellars dry,	86
" wet,	11
Not ascertained,	23
	147

The number of families occupying brick tenant-houses I have ascertained to be 634, as follows:

Houses four stories high,	94,	containing	460	families,	average about	5
" three	"	32,	"	132	"	"	4
" two	"	20,	"	40	"	"	2
" one	"	2,	"	2	"	"	1

While there is great uniformity in the shanties, and most of the wooden tenements, as regards their sanitary condition, there is a wide diversity in the different brick tenant-houses. Some of these latter, on account of the

lack of house and privy drainage, and of cellars, or the presence of wet cellars, possess all the causes of insalubrity which are found in the wooden tenements; while others, though a small minority, are nearly as well constructed to insure comfort and health as the better class of dwellings. In general, the oldest brick tenant-houses, and those built on unfrequented or unimproved streets, are the most objectionable.

There are, then, living in shanties, in tenements, and in brick tenant-houses, in the Twenty-fifth District, 3,221 families. It may be safely assumed that 3,000 families occupy domiciles which, from fault in their construction, or in their surroundings, are decidedly insalubrious. The exact character of the insalubrity will be pointed out hereafter. These families are mostly small, in consequence of the great mortality among infants and children, probably not exceeding, in the average, five. This gives a total of 16,105 individuals in the Twenty-fifth District, who reside in shanties, wooden tenements, and tenant-houses.

Good Dwellings.—The number of good dwellings in the Twenty-fifth District is 287, containing probably about 400 families. Below Fifty-ninth Street these dwellings are mostly of brick; above Fifty-ninth Street chiefly wooden; and above Seventieth Street, with three exceptions, entirely such.

Population and Occupations.—Those who reside in shanties are, with few exceptions, Irish and Germans; the Germans predominating. They are engaged in humble occupations. Many are day laborers, employed by contractors in various kinds of work, as in grading, paving, and sewering streets, and in the removal of rock, or in excavating for building purposes. Some are employed in the stables of the city railroads and stage companies, or in the Central Park, and not a few are in the army. In addition to these occupations, and occasionally as a sole means of support, many families keep cows or pigs, with poultry. In the brick and wooden tenements reside the large class of mechanics, as tailors and shoemakers, the drivers and conductors on the various city railroads, and many of those engaged in retail business on the avenues. In the wooden tenements the German families preponderate; in the brick, the American. Those residing in the better class of houses are mostly engaged in business down town, as merchants, clerks, real estate agents, brokers, bankers, etc.

Preventable Causes of Disease and Death.—(*a.*) *Stagnant Water.*—Much of the insalubrity in the Twenty-fifth District is, no doubt, traceable to the stagnant water. The surface of this district has been stated to consist of an alternation of hills and valleys, the latter having been once the source of several streams. These streams, with the exception of two,

have been obstructed by the grading of the streets. Sewerage has in some places partially obviated the bad effects of this obstruction, but at present there is stagnant water along the bed of four of these water-courses. There are five ponds of considerable magnitude produced in this way, besides smaller collections of water. Much of the ground above Sixtieth Street, between Eighth and Ninth Avenues, is permanently so wet, in consequence of obstruction to the natural drainage, as to be unfit for tillage; and the sunken and undrained lots become, to a certain extent, the receptacle of decaying substances, especially dead animals, and the garbage from adjacent houses. From the amount of wet ground which the Twenty-fifth District contains, it has always been the habitat of malarious affections. These affections are less prevalent in the southern part than formerly, owing to the greater amount of sewerage; while in the upper or northern part, where there is no sewerage, and the course of streams is interrupted, they are believed to be more frequent. This was the opinion of the late Dr. Williams, an intelligent and accurate observer, who, for nearly a third of a century, was almost the only physician living in Bloomingdale. Moreover, in the vicinity of the stagnant water, and probably, in part, in consequence of it, the continued fevers, diphtheria, and cholera infantum prevail to a greater or less extent. The ponds or pools of stagnant water generally have a roiled or dirty appearance; but in the warmest weather the hue is green, from the presence of minute organisms, chiefly animal, as I have several times observed by the microscope. During the warmest weather many of the smaller collections dry away, and they all become reduced in size.

There is also in the district considerable standing water in excavations, made in grading the streets or for building purposes. Even on elevated ground these excavations are occasionally met with, containing water collected either from rains, or from adjoining springs; but they are oftenest observed in the valleys, along and near the site of the old water-courses, even where there is no stagnant water on the surface.

(*b.*) *Sewerage and House Drainage.*—Insufficient sewerage and house drainage constitute, also, one of the chief causes of insalubrity. The shanties, the tenements, and a considerable portion of the brick tenant-houses, have no connection with the sewers, and no drainage, unless into the gutters. Generally a connection with the sewer is impossible, as there is so little sewerage in the district; but even in sewered streets, shanties and wooden tenements have no sewer connection on account of the small value of these domiciles, and the cost of constructing drains. This is less objectionable as regards shanties, on account of their being built over the squares, without order and with interspaces; but the wooden, and in part

also the brick tenant-houses, being built in rows along the streets, the slops from them are thrown into the gutters, where they form long lines of stagnant, or if the ground inclines, slowly-running water, of the most insalubrious character, and in many places continuing the year round. Wherever there are rows of wooden tenements this condition of the gutters generally obtains; and as there is such a large number of families living in these houses, the noxious exhalations from the gutters must be a prolific source of disease. In one locality the water of the gutters forms a network with occasional breaks, extending the distance of several squares. This nuisance might be partially obviated in sewered streets by the construction of more culverts, which are entirely too few for localities where the domiciles have no drainage, or else drainage to the surface of the street. That this description of the gutters is not exaggerated, will be apparent from a brief statement of the condition of Ninth Avenue and the cross streets, from Fiftieth to Fifty-fifth, along which streets there is a dense German population, living in wooden tenant-houses. All the gutters in this locality contain more or less water; and in the more crowded streets the quantity is ordinarily so great that there is a flow or current toward the river, as the ground inclines in that direction. Thus in Fifty-second Street there is a current in each gutter from Ninth Avenue to Eleventh, where it reaches the first culvert, which it enters, although this street is sewered from near Tenth Avenue to the river. In Fifty-third Street, the stream on either side, from Ninth Avenue, enters the vacant lots west of Tenth Avenue, where there is a pond of stagnant water. In Fifty-fourth Street the two streams from Ninth meet at Tenth Avenue, and thence flow to Eleventh; thence along Eleventh Avenue to Fifty-fifth Street; and finally down Fifty-fifth Street to the Hudson, a distance from the commencement of probably half a mile. All gutter streams produced by slops and house drainage are of course small, so that in hot weather they frequently dry away, leaving stagnant water in crevices and sunken places.

(c.) *The Condition of Domiciles.*—It has been stated above that elevated rocky localities on the one hand, and marshy and sunken ground on the other, are to a great extent peopled by poor families, who select these places for the erection of their cheap dwellings, either because they pay no rent, or but little. Elevations of rock are probably not objectionable to the sanitarian as a place of residence, but swampy ground obviously is. There are many shanties and wooden tenements constructed near the bed of streams, upon ground which is permanently wet, so as to render the apartments liable to dampness. Cellars in these localities are apt to contain water, in some instances through all

the seasons, as for example a cellar in Fifty-third Street, where, although remote from the river, fish have lived many months. In addition to the objectionable nature of the ground on which shanties and wooden tenements often stand, the salubrity of these domiciles is greatly impaired by their mode of construction. They are generally built with very little elevation of the floors above the ground, and sometimes after a period there is none in consequence of the accumulation of dirt and ashes outside. A large proportion of the wooden tenements, and many of the shanties, are warm and comfortable in cold weather; but others not being properly lathed and plastered, contain apertures through which the cold penetrates. The inmates of such domiciles suffer especially from those diseases which occur in consequence of sudden changes in the weather, as croup, bronchitis, pneumonia, and dysentery. The inadequate water-supply of both shanties and wooden tenements, by preventing proper personal and domiciliary cleanliness, is doubtless a source of disease.

Some of the brick tenant-houses are constructed with a proper regard for the health as well as comfort of the occupants. With others the case is different. In a large number of them the bedrooms have a central position on each floor, so that proper ventilation is impossible, the supply of air being through the door only, or a door and a small half window. Another fault of construction in some houses of this class, is the small size of the rooms, so as to cause crowding or packing of families, and thereby promoting contagious and pestilential diseases. As an example may be mentioned four houses, built however as one, at the corner of Broadway and Fifty-third Street. These houses are four stories high, but are not deep, and are built with the greatest economy of space, containing forty-five families.

Into one of these families, a few months since, typhus fever was introduced by an emigrant from Ireland. There were in the family no children, but six adults, including the emigrant, and only one escaped the disease. This family occupied a main apartment, measuring 10×12 feet, and two bedrooms each $7 \times 6\frac{1}{2}$ feet. It will be obvious to those familiar with typhus, that the spread of this disease was due, mainly, to the small size of these rooms, and the consequent crowding. In this class of buildings the pestilential and contagious diseases, when epidemic, prevail extensively and fatally. It has been seen that some of the brick tenant-houses have no drainage, and therefore, as regards salubrity, differ but little from those constructed of wood.

The better class of dwellings in the Twenty-fifth District, have been for the most part constructed with reference to health as well as comfort

of the occupants. The older houses of this class are, ordinarily, built of wood, and isolated; those more recently constructed, of brick, and in rows. The point of chief interest to the sanitarian in reference to these dwellings relates to their drainage. Some of the streets, where rows of brick houses have been erected, are not sewered, and proper drainage under these circumstances is hardly to be expected. It is necessary, in such streets, to connect the buildings with some distant sewer; and as the construction of houses in this district is, usually, in the hands of speculators and contractors, the drain to the sewer is apt to be built in a careless manner, and of poor materials, so that obstructions and leakages after a while occur. The longest row of houses in the district affords a striking example in corroboration of the truth of this remark. Fiftieth Street, between Eighth and Ninth Avenues, is not sewered, except a short distance near Ninth Avenue. A row of thirty first-class houses was erected a few years ago in this street, and they all connect with the sewer in Ninth Avenue, by a single drain, which runs under the houses from No. 1 to 30. The occupants of several of these houses have, to my knowledge, complained of an offensive odor arising from the cellars, due doubtless to cracks in the drain or a separation of the joints. In one of these buildings, where a child was sick last summer with cholera infantum, the parents stated to me that the odor was sometimes noticed on the second floor, and it may have been one of the causes of the disease. Two or three years since an eminent physician of this city, well known to the public as a sanitarian, stated in my hearing that he had visited two children in a house in this row, who seemed to be suffering from blood-poisoning, and one died. They were both much prostrated, and their tongues presented a singular dark appearance. In investigating the cause, he and the attending physician were shown to the cellar, the ground of which was wet, and exhaling an offensive odor. These physicians appear to have been ignorant of the peculiarity in the drainage of these houses, though satisfied that they had ascertained the cause of the disease.

The connection of a house with the sewer necessitates the payment of the sum of ten dollars, in addition to the cost of constructing the drain, which, if the ground is rocky, is considerable. On this account it is customary in building rows of houses to connect several houses, perhaps five or six, with the sewer by a single drain; and if this is done with as little labor as possible, and as cheap materials as the terms of the contract will allow, it is readily seen that the drainage of the so-called first-class houses, even in sewered streets, may be, and often is, very defective. In consequence, in many of these houses there is complaint of an offensive odor from the sewer, especially in certain states of the weather

(*d.*) *The Disposition of Garbage.*—One of the principal sources of impure air in the Twenty-fifth District is the garbage. It is removed pretty regularly from the better class of dwellings in a few of the streets, in the lower part of the district, either by boys sent out from shanties to collect it for domestic animals, or by the City Inspector's ash and garbage-carts. From this class of houses, located in the central and upper or northern part of the district, and from the tenant-houses and shanties generally, there is no regular removal of garbage. There are only twenty-eight garbage-boxes in the entire district, and some of these are so dilapidated as to be almost useless. These boxes are used by the occupants of the tenant-houses not only as receptacles for garbage but also for ashes; and being so few and so irregularly emptied, they are practically of little consequence. As there are about 3,221 families in the district who occupy tenant-houses and shanties, it may be safely said that there are 3,000 families who throw their entire garbage on the ground, where it decays. This disposition of the garbage adds most to the insalubrity of those squares which contain wooden tenements, for these houses are generally built compactly in rows, and the garbage from them is thrown into the gutters, where there is usually more or less stagnant water. This water then becomes impregnated with organic matter undergoing decay, and to add to the insalubrity these streets are seldom cleaned. For example, Fifty-second Street, between Sixth and Seventh Avenues, contains a dense population on either side, living in wooden tenements. In the gutters of this street there is always garbage and stagnant water. The street was opened about eight years ago, and one family informed me that it had never been cleaned; another that it was cleaned once about four years since. Garbage from the shanties probably does not add much to the insalubrity of the district, as the quantity of it is not great, and it is consumed to a considerable extent by the domestic animals.

(*e.*) *The Condition of Privies.*—Owing to the unsewered state of the streets, and the character of the domicile, there are numerous badly-constructed and undrained privies in the Twenty-fifth District. Most of the brick better-class dwellings, and five of the brick tenant-houses, are constructed with water-closets inside, and therefore without privies. All the other brick tenant-houses (142) and all the wooden domiciles, whether tenement or belonging to the better class, have privies.

Privies attached to wooden tenements and to shanties have no drainage, and it has been seen that of those connected with the brick tenant-houses there is no drainage to sixty-one. Privies belonging to brick houses, whether drained or not, are ordinarily well constructed. They

are of large size, with suitable doors and covers, and deep vaults. Those not drained are cleaned at intervals, so that the privies of such domiciles cannot be considered a cause of insalubrity.' The case is different with those belonging to wooden tenements and to shanties. These are generally very small, built mainly of rough boards. Many of them are located on rocky ground, and without vaults; others, and the majority, have shallow vaults, which are soon filled. It is evident that privies constructed in this way are a source of insalubrity, unless frequently cleaned; but to a large proportion of them proper attention in this respect is seldom given. They are most offensive, and add most to the insalubrity in those squares which contain rows of wooden tenements, for in such localities they are most numerous. It is here that families complain most of the odor from this source, which is so offensive that I have noticed it not infrequently in such domiciles in the apartments occupied by the sick.

The diseases which prevail most on those squares where the privies are most numerous and in the most offensive state, and which appear to be referable in part at least to them, are diarrhœal affections, especially of infants in warm weather. From observations made in this district, and more thorough and conclusive examinations in other districts, there is abundant proof that continued fever, especially the typhoid form, is also produced by privy exhalations.

Families living in the upper part of the district, near Eighth Avenue, complain much of the odor of night-soil, which is dumped in the Central Park for manure; bu tfortunately this portion of the district is sparsely inhabited. The cleaning of the undrained privies at night by scavengers is also a nuisance of which there is much complaint, as it produces an intolerable stench in the vicinity.

(*f.*) *Occupations.*—The occupation which has been most productive of insalubrity in this district has been the raising of hogs. At the time of the last epidemic of cholera, in 1854, this nuisance was in a measure abated through the vigilance of the police; but from the immunity granted to it of late, the number of pig-pens has again increased, though not to the extent of former years. The presence of pig-pens is objectionable, not only on account of the filthy habits of the animal and the offensive character of the excrementitious matter, but also on account of the nature of the food which is usually given to it. This consists largely of swill, and garbage obtained from private houses and from hotels in the city. It is collected in dog or horse carts early in the morning, and what is not consumed is thrown upon the ground, where it decays. In this way the amount of decaying animal and vegetable matter in the district is considerably increased.

Those engaged in raising hogs reside, for the most part, in shanties, so that the pens are chiefly on those squares where the shanties are located. The largest number on one square, that between Sixth and Seventh Avenues, Fifty-first and Fifty-second Streets, is 18, and here the hogs feed in part upon the viscera of animals obtained from a slaughter-house near by.

There are in the entire district only about 6 slaughter-houses, and all but two of these are so small that they are scarcely known in their immediate neighborhood. The two excepted are connected with sewers about 100 feet distant, and, unless in the warmest weather, no offensive animal odors are noticed in or around them. In one sheep, in the other cattle, are mainly slaughtered.

There are 7 establishments for the preparation of tripe. The odor from these, especially during the boiling process, and from the rejected portions cut or scraped from the tripe, and which are often not properly disposed of, are offensive, and without doubt insalubrious. The summer complaint of infants, occurred last summer in the immediate vicinity of at least 4 of these establishments (which are usually little more than sheds), and in apartments where the odor was at times distinctly noticed. But the occupations which are the most objectionable to the sanitarian remain to be noticed. In the interior of a square on which 189 families reside, is a sausage and fat-boiling establishment. The heads and viscera of animals are received here, and the parts which can be profitably used are selected, while the rest is thrown upon the ground or buried. The adjoining streets have no sewerage, and this building no drainage. In another part of the district, about one quarter of a mile distant from each other, are two establishments where the intestines of cattle are cleaned, boiled, and packed for transportation to Germany, to be used in the manufacture of sausages. People living near these buildings complain much of the stench arising from them. The part which they bear in the causation of disease, will be seen when we come to treat of insalubrious localities.

(*g.*) *Dram-Shops.*—At a recent meeting of the Board of Inspectors, a member of the hygienic council stated that accidents on the city railroads constituted a proper subject for sanitary inquiry. Surgeons who are called to treat such cases do not find it difficult to discover the chief cause in the sale of intoxicating drinks. A very large proportion of those who receive injuries either on the railroads or elsewhere, are intoxicated at the time. It is the experience too of all physicians, that those who are in the habit of taking alcoholic drinks, are not only more liable to certain kinds of disease than the temperate, but that with them all diseases are

more severe, and more apt to terminate unfavorably. The drunkard, from exposure to the weather, from irregularity in sleeping and eating, from frequenting dens of vice, which he would shun if sober, from perversion generally of his faculties, invites disease, so that community would be startled did they know in how large a proportion of cases of sickness intemperance is either a direct or predisposing cause. But the effects of this vice in the production and aggravation of disease, are not confined to the victim of the habit: the intemperate parent slights his family, in sickness as well as in health, neglects in many instances to send for a physician till the disease of his wife or child is too far advanced for successful treatment. Moreover, the destitution of the drunkard's family often necessitates the use of improper food and insufficient clothing, and an exertion in procuring the means of support beyond their strength or years, and therefore incompatible with their health. The child, scarcely advanced beyond infancy, who, trembling with cold, begs a piece of bread at your basement window, or whose hands are already hardened by work in the stifling air of the factory, is compelled thus to endanger its health in the formative period of life, in a large proportion of cases, through the intemperance of one, or both of its natural protectors. Hence the sale of intoxicating liquors is not only a proper, but an important subject for sanitary inquiry. Though the use of brewed liquors is not so injurious to the health of individuals as is that of distilled liquors, still some of the evil effects mentioned above proceed from the former as well as the latter, but in less degree. In the Twenty-fifth District are 53 liquor stores; 44 groceries, containing bars; 48 lager bier saloons. There is, then, one store where distilled liquors are sold to every 37.5 families, and one lager bier saloon to every 75.1 families. The distilled liquors are, with very few exceptions, prepared in the city, and, being of inferior quality, are sold at low prices. There are in the district only about 12 groceries which do not contain bars, so that the sale of distilled liquors is a more extensive, and, probably, more profitable business than that of groceries. Since the commencement of the war, several liquor stores, and some lager bier saloons, have been closed.

There are occupations pursued in the Twenty-fifth District which are detrimental to the health of those who engage in them, but not to community at large; and as they affect injuriously only a small relative number, they will not be considered in this paper.

(*h.*) *Unwholesome Articles of Diet.*—This is a subject which has not received the attention it deserves; but enough is known to lead to the belief that improper or insufficient food is a cause of impaired health and of disease among the poor of this district. The milk used by families

occupying shanties and wooden tenements is, in great measure, obtained from cows stabled in the city, or, as it has been termed, "swill-milk." That this milk is unsuitable food, especially to infants in warm weather, is well known. The use of it increases the number and severity of cases of cholera infantum. The children of the poor often eat rye bread and cheap molasses, with almost no animal food, the year round, except on certain days and special occasions. Even the swill-milk is too expensive for general consumption in the family, and is reserved for the infant. Such diet, doubtless, tends to produce that cachetic or scrofulous state so often visible in the features of these children, and which renders them so easy a prey to disease.

The practice of rigid economy among the poor induces them to purchase cheap and tainted meats and unripe or stale vegetables, and, in the summer season, the effect of this diet is apparent in the production of such diseases as cholera morbus.

Much of the pork raised in the city and its environs is consumed in the shanties and tenant-houses. The drab and mottled appearance and peculiar oily and disagreeable flavor of this meat, renders it probable that it is not a wholesome article of diet.

Below Sixtieth Street the water used for cooking purposes, as well as for drink, is chiefly the Croton. Above Sixtieth Street it is ordinarily obtained from wells or springs. Many of the shanties in this part of the district are so remote from croton hydrants, and from wells, that it is not practicable to obtain water from either. Families living in these localities usually obtain their water from holes dug in the ground where it is marshy. These excavations contain water nearly level with the surface of the ground, and, with occasional exceptions, covered by boards or surrounded by a curb. In these holes, which cannot properly be called wells, collect not only the drainage of the valley, but also the washings from the adjacent slopes on which shanties, with their pens and sheds, are located. Professor Draper lately made a chemical analysis of water from one of these valley excavations, and found that it contained "liquid poison;" contained a larger proportionate quantity of organic matter than the Seine or Thames. Yet there is water in this district, used both for cooking and drinking, which receives the washing of shanties and of pens in greater degree than that which he examined.* In Sixty-eighth Street.

* The following note, accompanied by the report of the analysis, sets forth the facts upon this subject:

"University Medical College, 107 *East Fourteenth Street, New York, Oct. 4th*, 1864.

"Dr. E. Harris:

"Dear Sir.—I enclose the analysis of the sample of water sent by Dr. J. L.

midway on the slope of a hill, is one of these holes, without any cover or curb, or inclosure whatever, and full of water, so that any stray pig or goat can drink from it. The slope is nearly or quite destitute of grass, and between the excavation and the summit are 5 shanties, with their yards, containing pigs, geese, and dogs. During rainy weather, the water from above flows so near this excavation that there is doubtless a much larger proportion of "liquid poison" deposited in it than was found in the specimen analyzed by Prof. Draper. There are, probably, about 150 families who obtain water from excavations similar to those described.

(*i*) *Still-births, Deaths of Parturient Women.*—In the enumeration of preventable causes of death, we approach an unpleasant subject, about which little is known outside the medical profession. We allude to the subject of still-births, and deaths of mothers in confinement. The poor in New York cannot, in many instances, afford sufficient remuneration to secure suitable attendance in child-birth. The institution for lying-in women is totally inadequate to meet the wants of so large a class, and in most cases is not applied to, probably in part through a feeling of pride. Consequently, in some of these families, neither midwife nor physi-

Smith. You see at once what is its peculiarity—the very large amount of organic matter. This is reported to me to have been of the most fetid kind, suggesting the proximity of a sewer, privy, or some other putrid receptacle.

"Now, there is, obviously, but one thing to be done in such a case. It is to close up the well. The people that use it are drinking so much liquid poison, and no wonder they have bowel complaints.

"Compare the filthy water with waters elsewhere used. It has, in a gallon, more than 48 grains of solid matter, half of which is organic. But the Thames water has only 15 grains, the Seine water 20 grains, and the Danube 10¼ grains.

"You mention in your note the Permanganate of Potash tests. You will perceive that the quantities here determined have been by the customary process of Quantitative Analysis, which, though more troublesome, is incomparably more correct.

'Yours truly,

"(Signed) JOHN. W. DRAPER."

Report of an analysis of a sample of water from a well in the Twentieth Ward. Presented by Dr. J. Lewis Smith, inspector Twenty-fifth District.

Amount of water sent for examination, 24 ounces.

	Grains.
Organic matter and volatile salts, per gallon, . . .	$23\frac{88}{100}$
Fixed salts, " . . .	$24\frac{29}{100}$
Total solid residue, " . . .	$48\frac{17}{100}$

HENRY DRAPER, M. D.

Chemical Laboratory University of New York.
October 4th, 1864.

cian is employed, in order to save the fee. Neighboring women give their advice and assistance, often more to the injury than help of the patient. In other families midwives are employed with the small fee of three dollars, who are mostly uneducated, and are, of course, unfit for the duties which they assume. They ordinarily lack patience, which is indispensable in judicious midwifery; and by the use of baths, fumigation, and, worst of all, ergot, before delivery, and their reckless treatment of the patient afterwards, lead to great and unnecessary sacrifice of life. Instances might be cited.

Other families send for physicians, promising pay, which perhaps is sufficiently remunerative if the detention is short, but not if otherwise. There are strong inducements, which many do not resist, to expedite such cases by means which are hazardous to both mother and child. Indeed, an amount of self-denial is required on the part of the physician, in some of these cases, if he treat them carefully and judiciously, which few can appreciate who have not been similarly situated. To stay hour after hour, perhaps all night, in a shanty, or the close room of a tenant-house, inspiring an atmosphere which is poisonous, obliged to answer perpetual queries in reference to the patient, afraid to lie, or almost to sit, through regard for personal cleanliness, and that, too, when there are urgent and more remunerative duties elsewhere, or when sleep is greatly needed, requires an amount of patience and benevolence which every one does not possess. Hence physicians engaged in this practice often resort earlier than they should to the use of the forceps or ergot, in order to terminate their own suffering as well as that of the patient, with the hope that it may be as well for the mother and the child, but with consciousness of the risk, and sometimes with a result which leads them to regret that they had been so hasty.

This truthful statement of midwifery among the poor, explains, in part, but not entirely, the reason why there are so many still-births, and so many deaths of parturient women among these people. The mode of life, and the recklessness of the women themselves, before and after confinement, constitute, doubtless, one cause.

A section might be added on the treatment of diseases, especially among the poor, by which there is an unnecessary increase in the number of deaths; an important and interesting subject, but to which we can only allude.

Brothels.—There is not in the entire district a single brothel; or, if there is, it is conducted so secretly that it is not generally known. Consequently, the diseases which originate in such places are not so frequent as in other parts of the city, and decoy-women are rarely seen in the streets at night.

Fire-Escapes.—From the suburban character of the district there are many houses, three or four stories high, built isolated, and only one of these has a fire-escape. Here is a constant source of danger to those who occupy the upper floors of these houses, though, fortunately, fires are not so frequent in the upper as in the central and lower parts of the city, and no accident has occurred in the district from this source, at least during the last ten years.

Crowded Domiciles.—There is less packing or crowding of families in domiciles in the upper part of the island than is complained of by inspectors in the thickly-settled wards. Some of the tenant-houses in this district contain more families than a proper regard for salubrity would allow. The most crowded building is an asylum for soldiers' children in Fifty-eighth Street, which, with a ground area of 43 feet by 45, contains one hundred children. But sufficient publicity has been given elsewhere to this institution.

Habits.—A statement of the preventable causes of disease will not be complete without a section on personal domiciliary habits; but more space is required to treat this subject properly than the limits of this paper will allow.

There is one fact, however, to which we will call attention, and that is the practice, common among poor Germans, of living in apartments too highly heated; of covering their children with an unnecessary amount of clothing, and of sleeping between feathers even in the warmest weather. The infant among these people is often placed lengthwise upon a large pillow, which is then wrapped around it, and secured by cord or tape, so that only its head is visible, projecting from the end of the pillow. Such personal and domiciliary habits among people occupying wooden tenements, which are especially subject to changes of temperature, evidently increase the liability to inflammatory affections, especially of the throat and chest, and the children in these families are the very ones who are oftenest sick with croup, bronchitis, and pneumonia.

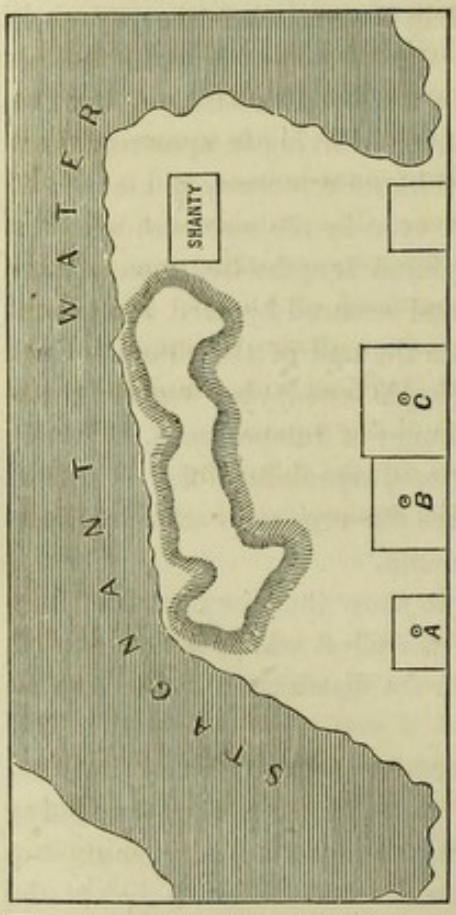
Insalubrious Localities.—In order to show that the causes of insalubrity mentioned above do actually have the effect which is represented, a few of the most insalubrious localities in the district will be briefly described.

There is a lot 25×100 feet which contains a tenant-house in front, and another in the rear, with two rows of sheds between, accommodating six horses and four cows. The location is near one of the old water courses (*see* the Map page 299 [A]), so that the surface of the lot is below the grade of the street, and wet. The interspaces between the two sheds, and between the sheds and the houses, are covered with loose boards, between

which water can be seen stagnant. There is decaying vegetable matter, as apples, potatoes, turnips, and cabbage designed as food for the animals, lying upon and between the boards, and a considerable part of the year there is stagnant water by the side of the rear house, in the adjoining lot. Here is abundant cause of disease, and, as a consequence, typhus fever has occurred in the rear house, in the last six months.

In Fifty-second street, between Sixth and Seventh Avenues, there is a dense German population on each side, in wooden tenant-houses. This street is not sewered, and has not been cleaned in four years, as is elsewhere stated. Nos. 151 and 153 are on low ground, with stagnant water in a ditch between them, and in the gutter in front. This water contains refuse matter thrown into it from the houses, so as to exhale a deadly miasm during hot weather. As a consequence, an infant in each house rapidly succumbed to cholera infantum last summer, before the warmest part of the season was reached.

Between Seventy-fifth and Seventy-sixth Streets a point of land juts out from Eighth Avenue into a pond of stagnant water, produced by obstruction to a water course (marked on my district map as C), by work on the Central Park. This point of land contains one shanty and three wooden tenant-houses, till lately but two, occupied by nine families. During the past twenty months, there have been among these people dysentery, typhoid fever, intermittent fever, and cholera infantum, and three deaths of infants. These diseases and deaths were unquestionably due to the insalubrity of the place, caused by the stagnant water. In this diagram it will be observed that the area occupied by the dwellings is surrounded by the filthy pond on three sides.



Between two streets west of Tenth Avenue is another insalubrious locality. This square contains two establishments for the preparation of tripe, one for curing intestines, a few pig-styes and cow-stalls, and nineteen wooden tenant-houses. The odor from these various sources is at times very offensive in the vicinity, especially during the process of boiling the intestines, and the effect, especially on the health of infants, is quite apparent.

The best idea of the insalubrity resulting from the nuisances of this locality, will be conveyed by mentioning my own experience. A considerable part of the square is in a valley more than twenty feet below the grade of the streets, and is crossed diagonally by a stream (E).* On a close, sultry evening of last summer, I was asked to see a child with cholera infantum, near this water-course. At this time the intestines were boiled in the latter part of the day; and as noxious exhalations fall to the ground at night, the immediate neighborhood was filled with gases exceedingly offensive to the nostrils, and doubtless proportionately injurious to health. In the valley there was such a concentration of effluvium, that it seemed to me were it not for the conservatism in the economy due to acclimation it would be hardly possibly to support life.

Of course the infant in such an atmosphere was in a hopeless state, and died soon after. Before leaving I was requested to see another infant with the same disease, the result of which was probably similar, and an adult troubled with pain and looseness of the bowels. During the entire evening it was impossible for me to remove the offensive taste of these exhalations from my throat, in spite of gargling with water.

But to show how the causes of insalubrity may affect a large number of individuals, we would refer to the accompanying diagram, which represents the most thickly settled square of the district. This square contains one shanty, two brick, and sixty-five wooden tenant-houses, and a population of one hundred and eighty-nine families. The number of families in each house is stated in the diagram. The diseases occurring among these people from the first of January to the beginning of October have been ascertained, and written opposite the diagram, with the exception of the cases among the families on and near Ninth Avenue, with whom there has been much less sickness than in other parts of the square.

The obvious causes of so much sickness are the following:

1st. The low ground in the centre of the square, which was once the source of a stream (D).*

2d. Crowded populati .

3d. Absence of sewerage, and of house and privy drainage, so that there is water with garbage in the gutters almost the entire year, and an offensive odor from many of the privies in the rear of the houses.

4th. A sausage and fat-boiling establishment, also without drainage, and having a central position toward one end of the square. The effluvia from this establishment sometimes compel the people in the adjoining houses to close their windows.

* The letters E and D refer to streams that are indicated upon the Map, p. 299.

Prevailing Diseases in one square in 1864, *prior to Oct.* 1*st.*

[Domiciles in which sickness occurred are designated by letters.]

a. Two infants died of diphtheria.

b. An infant died in warm weather.

c. Two infants spoon-fed, died in warm weather, twelve and fourteen days old.

d. An infant has had the bowel complaint during the six weeks preceding Oct. 1st.

e. An infant has been sick several weeks, and is now much reduced, the mother says, "*with its teeth.*"

f. An infant died of cholera infantum in warm weather.

g. A boy two years old had typhus fever in September. An infant died in the summer.

h. An infant had bowel complaint in hot weather.

i. " " " "

j. A spoon-fed infant died of cholera infantum. A girl about eight years old has typhus at present (Oct. 1st).

k. Two children had dysentery.

l. Two children had inflammation of eyes.

m. A child twenty-one months old had diarrhœa all summer.

n. Two infants had cholera infantum; one died. One child has inflammation of eyes.

o. An infant one year old had cholera infantum.

p. An infant had cholera infantum in summer. A girl had fever (probably typhus).

q. Two cases of dysentery, and three of cholera infantum, in hot weather.

r. One case of cholera infantum.

s. An infant in the summer very sick with cholera infantum. A girl eight years old now has fever.

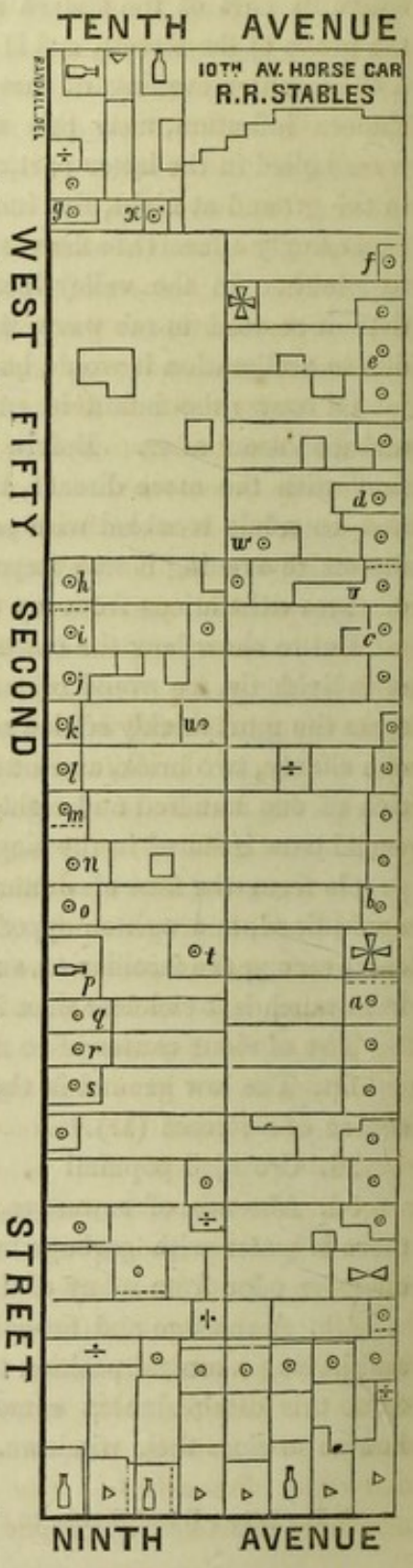
t. An infant had cholera infantum.

u. Severe attack of dysentery in an adult.

v. An infant died in warm weather with the bowel complaint.

w. An infant died of cholera infantum.

x. An infant sick with diarrhœa in summer, recovered.



5th. A pond and adjacent wet ground containing the entire drainage of the domiciles in Fifty-second Street, between Ninth and Tenth Avenues, beside the drainage of a cluster of houses and privies west of Tenth Avenue. Dead animals are also thrown into this pond.

To a physician, an attentive examination of this diagram, showing, as it does, the nature of the prevailing diseases, would do more than an essay to convince him of the need of proper sanitary regulations, as a means of reducing the amount of disease and death in this city.

Preventable Diseases in the Twenty-fifth District.—In the examination of diseases of a preventable nature, sanitarians very properly give much attention to the fevers, since the causes of these affections are in great degree under our control. All agree that the causes of intermittent and remittent fevers are susceptible of complete removal, and perhaps also the causes of typhoid and typhus, could proper sanitary regulations be enforced. These diseases occur in all parts of the district, though typhus is more frequent in the southern, and intermittent and remittent fevers in the northern section, as has been stated. Diphtheria also prevailed in sparsely as well as thickly-settled portions of the district during the recent epidemic of the disease in New York. The most severe cases seen by me were in basements of brick and wooden tenements, in rear buildings, and in shanties in marshy localities, although it spared no condition of domicile or of life. Though not susceptible of entire prevention, its malignant character could, no doubt, be greatly modified if people lived generally with a proper regard for the laws of health.

The eruptive fevers are much more prevalent in the district than they would be with proper sanitary regulations. Small-pox prevails more or less every year in portions of the district, notwithstanding the readiness of physicians to vaccinate, and the proffer of gratuitous vaccination on the part of the dispensaries. Many parents, either from indolence or forgetfulness, do not have their children vaccinated; and some refuse to have it done, in spite of the remonstrance of their physicians, either because they believe it ineffectual as a preventive of small-pox, or dangerous as a means of communicating scrofula.

Scarlet fever and measles, the former very fatal, are of frequent occurrence. Both these affections, as well as the other contagious diseases of children, become vastly more frequent in consequence of exposure in the public schools. In truth, the public schools spread such diseases over the entire district. Hence, could proper regulations be enforced in reference to the schools, the amount of sickness among children might be materially diminished. The diarrhœal affections could be, in a great measure, controlled by proper sanitary regulations, and they add largely

to the mortality of the district, especially in the summer season. Asiatic cholera, fortunately not a frequent visitant, it is well known, ravages most the insalubrious localities. It has occurred once in this district during my residence in it, namely, in 1854. At this time there were many pig-pens between Sixth and Seventh Avenues, Fiftieth and Seventieth Streets, and over this wide section it prevailed most extensively and malignantly. During the entire summer of this year, after nightfall, the air in the vicinity of the pens and stables was always very offensive to the smell, and the disease occurred most frequently at night, when the noxious exhalations remained in the lower portions of the atmosphere.

During the months of July, August, and a part of September, so often did these cases occur at night, that physicians who attended them usually expected to be called from bed between the hours of one and three A. M. The recollection is vivid to this day of the great mortality from this disease, not only in the immediate neighborhood of the pens and stables, but also in certain houses where there were obvious causes of insalubrity. Thus in a double three-story tenant-house in Seventh Avenue resided a butcher, whose daughters were occupied in removing the fat from viscera sent from the slaughter-house. This occupation gave rise to an offensive odor, which was noticed, not only in the apartments where the viscera were kept, but in the adjoining hall. The epidemic first visited the family of the butcher, and then ravaged room after room to the top of the house, with a rapidity and violence which rendered it certain that it had found in the animal miasm a condition exceedingly favorable for its development.

In the course of this summer so great was the panic, that it was resolved by the authorities to remove all the hogs beyond the limits of the island; but this wise sanitary measure was only partially carried out, on account of the resistance and evasions which it met.

In another three-story tenant-house the disease was more than ordinarily malignant, and the cause was afterwards found in the cellar, where hogs were kept in order to escape the notice of the police. Cholera also occurred in the other parts of the district; but in the locality which we have described, this midnight messenger of death lingered after comparative salubrity had returned to most other portions of the city. The preventable nature of cholera morbus is well known. It is induced mainly by the use, in warm weather, of fruits and vegetables frequently unripe or stale.

But the diarrhœal affection which is most destructive to life in this district, and in the city, is cholera infantum. Therefore we shall treat somewhat at length of this disease, especially of its preventable nature. The term cholera infantum, originally applied only to those severe cases in which there are frequent serous evacuations and rapid prostration of the

infant, is now employed to designate all severe and dangerous cases in which diarrhœa is the prominent symptom, occurring in the summer season. This disease begins to appear in the latter part of May, and from this time till November it is the most common and fatal disease which the physician is called to treat, except when Asiatic cholera prevails. It generally commences with moderate diarrhœa, the evacuations being often green, and sometimes containing undigested casein and partly-digested particles of solid food, if its diet have been of this character. After some days vomiting commences, and, if the disease continue, the patient becomes more and more emaciated and weak. Instead of this gradual commencement, the onset of the disease is sometimes violent, an actual cholera morbus, especially if improper food has been taken. Recovery or death may occur at any period, but a fatal termination is not usual till after the lapse of several weeks; and of those who linger through the summer months, many finally recover as the weather becomes cold, though from a state of extreme emaciation.

There is much doubt in the minds of physicians in regard to the exact causes of cholera infantum. The belief is prevalent in and out of the profession that dentition is one of the chief causes, and that therefore the disease is in a measure unavoidable. Many lives are lost annually in consequence of this belief, since the parents not unfrequently neglect to procure medical advice till the last stages of the disease are reached, acting in the idea that the diarrhœa is the result of dentition, and a relief to it.

The following statistics, which throw some light on the causation of cholera infantum, are drawn from observations made, for the most part, in this district:

TABLES.

Age.	*Nos. of Cases.*
5 months or under,	52
From 5 months to 12,	193
" 12 " 18,	153
" 18 " 24,	88
" 24 " 36,	27
Total,	513

Stage of Dentition.	*Nos. of Cases.*
No teeth,	38
Cutting incisors,	84
" anterior molars,	31
" canines,	36
" last molars,	14
" all the teeth,	25

When disease began	*Nos. of Cases.*
Beginning of summer,	5
In June,	16
" July,	35
" August,	25
" September,	3
" October,	1
	85

Under the age of 2 years.	*Nos. of Cases.*
Nursing,	36
Weaned,	27
Spoon-fed and occasionally nursed,	15
	78

Under the age of 18 months.	*Nos. of Cases.*
Weaned in spring or summer,	20
" autumn or winter,	8

As dentition commences at about the age of six months, we see that many cases of cholera infantum occur before the period of dentition, and

some afterwards; so that in a large number of cases this physiological process cannot operate as a cause. Dentition, it is generally admitted, will sometimes increase the peristaltic action of the intestines, and consequently the number of evacuations; but there is no evidence that it ever produces organic change in the mucous surface of the intestines, which occurs in cholera infantum, for in fifty-eight *post-mortem* examinations in cases of this disease which I have witnessed, colitis was uniformly present, frequently entero-colitis, unless the patient had died within the first week of its sickness.

According to my experience, the younger the infant, the conditions being the same, the more liable it is to this disease; and the reason why fewer have it in the first half year of life than in the second or third, is that in these latter periods more are weaned. Bottle-fed infants under the age of six months, rarely escape the disease in this city during the months of July and August. That the causes of cholera infantum are in a great measure atmospheric, is evident from the fact that the disease occurs only in the season of high temperature; that though so frequent in the city, it is rare in the country; and that in the city it prevails most where the atmosphere is most insalubrious. That the causes are, in part, dietetic, is evident from the above statistics. Although it is customary for mothers, in the class among whom these observations were made, to suckle their infants till nearly the age of two years, one-third of those under this age who had cholera infantum were weaned, and a portion of the remainder were spoon-fed in part. In another table it is seen that a larger proportion take the disease who are weaned in, or immediately before warm weather, than in autumn or winter. These facts show clearly that the nursing infant is much less liable to the disease than the one who uses cows' or goats' milk, or solid food, especially such milk or food as is used in the families of the poor.

Cholera infantum, if we include under this head those cases of marasmus which result from it, is the most fatal disease in the city except consumption. It adds nearly two thousand to the aggregate death-list each year, and yet it is one of the most preventable, and, in its first stages, curable diseases.

Let the physician and the parent correctly understand the preventable nature of this disease, so that instead of quietly and resignedly deploring the bad effects of dentition, they set themselves vigorously at work to provide purer air, and a more wholesome diet for the child, if need be, by removing it to the country, and cholera infantum would no longer stand second in the lists of deaths.

These diseases we have thought best to particularize, as they are so

eminently susceptible of prevention or modification; but other affections might be mentioned which would be much less frequent, were the laws of health better understood and obeyed.

Remedial Measures.—It is difficult to determine, exactly, what measures should be employed in order to remove those causes of disease which have been mentioned above, or, if their removal be impossible, at least to restrict their operation. But it is evident that in order to promote the salubrity and health of the district, the following measures are requisite:

1st. Sewerage of all occupied streets, and the connection of each house with the sewer by a suitable drain. Sewerage, also, sufficient to remove stagnant water.

2d. The construction of water-closets like those in the better class of houses, so far as practicable, in place of privies. These can be located within the domiciles, or in the yard. If privies are built, building them with proper covers and vaults, and with drains trapped, so as to prevent the escape of sewer gas.

3d. The construction of an adequate number of garbage-boxes of an improved pattern, perhaps as recommended by some of the inspectors, having covers, trapped drains, and hydrants attached.

4th. Cleaning the streets at short and stated intervals, and the use of Belgian or Russ pavement, in order to facilitate the cleaning.

5th. Ordinances to improve the mode of constructing domiciles, especially in reference to the size and ventilation of rooms in tenant-houses, and the elevation of the first floors of shanties and tenements above the surface of the ground, so as to prevent dampness; also an ordinance in reference to the construction of fire-escapes.

6th. Ordinances either prohibiting or regulating those occupations which add to the insalubrity of the district, or increase the number of deaths. Occupations of this character, which confer no benefit on the community, should, so far as possible, be suppressed. Others which are useful, such as hog-raising, should not be allowed within the limits of the city, or should be subject to such restrictions as would render them in the least possible degree injurious to the public health. The advice of the city inspector in reference to this matter deserves consideration, that markets, slaughter-houses, and similar establishments be placed in one locality.

7th. Ordinances regulating the sale of articles of food, especially milk, vegetables, and meats. Also the construction of more Croton hydrants, so as to furnish a better supply of water to the poor in the central and upper parts of the district.

8th. Regulations in reference to medical practice, especially the obstetric branch. As obstetrical cases are largely attended by women, and will doubtless continue to be, should not the education of women for attendance in midwifery be encouraged?

9th. Regulations to prevent the spread of contagious diseases, such as exclusion of unvaccinated children from the schools, and what is still more required as a preventive measure, the exclusion of those children who are exposed at home to small-pox, varioloid, scarlet fever, or measles.

This brief enumeration of remedial measures is, of course, incomplete. It has been our object simply to present certain particulars in which sanitary reform is needed, and is apparently quite feasible. The exact details of the manner in which so desirable an end can be attained, will be best determined by a competent board of health.

JOINT REPORT

OF THE

TWENTY-SIXTH AND TWENTY-SEVENTH SANITARY INSPECTION DISTRICTS.

H. MORTIMER BRUSH, M. D., AND ALEXANDER HADDEN, M. D.
Sanitary Inspectors.

BOUNDARIES OF THE JOINT DISTRICTS.—*North by Eighty-sixth Street, east by the East River, south by Fortieth Street, and west by the Sixth Avenue. This district comprises the Nineteenth Ward.*

In reviewing our reports, the fact will doubtless be noticed that, notwithstanding the comparatively healthy condition of all classes of the population, there is scarcely a block throughout our two inspection districts that has not either a publicly acknowledged nuisance, or a something which directly deteriorates public health. The causes of complaint to which we refer do not all require a special act of legislation to remove; many of them being already provided for by law. The city inspector's report for 1863 may be brought in conflict with the above statements in regard to the general health of this district. His report of mortality gives the number of deaths in this, the Nineteenth Ward, as 2,382; nearly 1,000 more than in any other ward in the city; but this includes the mortality of the institutions on Blackwell's Island, the St. Luke's Hospital, Colored Home, Nursery and Child's Hospital, and the various orphan asylums which are located in this ward.

The population of the Nineteenth Ward, according to the last census, is 31,004—adults, 16,918; children, 14,086. The present population cannot be less than 40,000.

TOPOGRAPHY.—The original topography of this part of Manhattan Island is very difficult to describe with accuracy. The surface was very uneven, abrupt ledges of rock running boldly up 122 feet above tide-water; valleys almost encircling them, sinking as low as 11 feet. The

principal portion of the surface was dry, only about one-tenth being marshy, and that along the water-courses. The general inclination, south of Seventieth Street, is southeasterly, waters flowing into the East River, between Forty-seventh and Forty-ninth Streets. Above Seventieth Street the inclination is directly eastward. The character of the soil is mostly clay: hard-pan about four inches below the surface. About one-eighth of the whole district is made-ground. The materials used have been stones, excavations of cellars in the vicinity, the levellings of high ground, &c., &c.

Origin, direction, and present condition of water-courses.—There are four original water-courses in these districts.* One arises in the neighborhood of Fourth Avenue and Forty-sixth Street, and taking a southeasterly direction, crosses Forty-fifth Street between Fourth and Lexington Avenues, crosses Lexington Avenue at Forty-fourth Street, then runs south to Forty-second Street, along Forty-second Street east to midway between Second and Third Avenues, then south to Thirty-eighth Street, then taking a southeasterly course empties into the East River at Kip's Bay, between Thirty-seventh and Thirty-sixth Streets. The second water-course arises at Seventy-second Street near Ninth Avenue, and taking a winding southeasterly direction empties into the East River at Turtle Bay, foot of Forty-seventh Street. This stream crosses the lower portion of Central Park to the southeastern angle at Fifty-ninth Street, crosses Fifth Avenue at Fifty-eighth Street, then winds northward to Sixtieth Street midway between Fourth and Fifth Avenues, then turning south runs parallel with Fourth Avenue to Fifty-third Street, crosses Fourth Avenue, Lexington Avenue at Fifty-first Street, Third Avenue between Fiftieth and Fifty-first Streets, crosses Fiftieth Street midway between Second and Third Avenues, Forty-ninth Street at the junction of Second Avenue, then a direct course to the river. The third water-course is short and superficial. It rises at about Sixty-fifth Street and Second Avenue, runs southeast, crosses First Avenue between Sixty-fourth and Sixty-fifth Streets, and opens into the East River between Sixty-first and Sixty-second Streets. The fourth water-course is also superficial. It rises by three forks, one in the high grounds of Eightieth Street near the Tenth Avenue, the other two in the Central Park between Sixty-eighth and Seventy-ninth Streets, crosses Fifth Avenue at Seventy-third Street, runs directly eastward between Seventy-fourth and Seventy-fifth Streets, emptying into the East River between the said streets. By as correct information as can be gained, the two lower water-courses west of the Third Avenue are turned into the sewers; east of the Third Avenue they are below the

* See the Sanitary and Topographical Map at beginning of volume.—EDITOR.

sewers. The condition of the latter is difficult to ascertain, but most of them are bridged over; the sewer running a number of feet above. These give indications of their insufficiency to carry off the absorbed waters, as the spongy condition of the ground after heavy rains in these localities clearly shows. The cellars, also, in the vicinity of these water-courses, if they have not a direct communication with the sewer, are found very damp, giving evidence of the water being near the surface. The drainage below Sixtieth Street is nearly complete. The principal streets and avenues are sewered and paved. All the sunken lots, with but few exceptions, are filled in and drained. Above Sixtieth Street the drainage is incomplete. Only a few of the streets are sewered, not any paved, many are not yet cut through, and a large part not graded. The topography in this section of the ward presents many original features. The two superficial water-courses mentioned above are as yet uncovered, nor are they in any way improved. Fevers caused by malaria are the prevailing diseases in those parts of the districts where the sewerage and drainage is imperfect. Above Sixtieth Street agues are very prevalent; also around the pools of stagnant water between that and Fortieth Street.

Streets.—The direction of the streets in these districts is east and west. The direction of the avenues is north and south. The width of the streets is 60 feet, with the exception of Forty-second, Fifty-seventh, Seventy-ninth, and Eighty-sixth Streets, which are 100 feet wide. The avenues are all 100 feet wide, with the exception of Lexington Avenue. Most of the streets are paved with trap-block pavement, cobble stones now being seldom used. Some of the streets have no pavement, especially those above Sixtieth Street.

The surface and gutters in some of the streets are allowed to remain in a very filthy condition: for example, Forty-third Street, between Fourth and Lexington Avenue; Forty-seventh and Forty-eighth Streets, between First and Second Avenues; Third Avenue, between Forty-ninth and Fiftieth Streets; First Avenue, between Fifty-fifth and Fifty-fourth Streets, and Fifty-fourth Street between First and Second Avenues. The influence the condition of these streets exerts upon the public health is very evident; the children found here have a strumous appearance, and many of them are constant applicants to the physician for relief. Diarrhœa, cholera infantum, and typhoid fever prevail most extensively in these localities, where the air is rendered impure from the exhalations of garbage, house-slops, etc., which are thrown into the streets and gutters.

Sewerage.—The sewerage below Sixtieth Street is quite general; above that, very few of the streets are sewered. The sewers, as far as can be ascertained, are in a very fair condition; they empty into the East

River by eight openings or outlets, viz.: Forty-fifth, Forty-seventh, Forty-eighth, Forty-ninth, Fifty-fourth, Sixty-first, Seventy-ninth, and Eighty sixth Streets. These, with three exceptions, open into the river above high-water mark. (The exceptions are Sixty-first, Seventy-ninth, and Eighty-sixth Streets sewers.) Sewer mouths above the water level may be objectionable. The sewer gases escaping from these openings before coming in contact with the salt-water, are carried back into the city by easterly winds; furthermore, the same winds force back these gases through the sewers, which, escaping through "stench pipes" opening on the tops of houses, and often through defective house-drainage, the outer air of a densely-populated neighborhood becomes tainted, also that of dwellings, so that disease of a low type springs up as it were from the grounds: these are scrofula, typhoid fever, cholera infantum, and many others, upon which medical skill is unavailing, unless the patients are removed to other localities more healthy.

SQUARES.—In the two districts there are 276 squares. Of these but very few are in a good sanitary condition; a fourth of the number are in a bad, and the remainder in a faulty condition.

There are numerous causes which render these squares in whole, or in part, insalubrious: and of these we particularly mention defective sewerage and drainage of the houses, and very defective plumbing; the filthy condition of some streets and gutters, the old wooden boxes on the walk used as the receptacle for garbage and house-slops, and which it is impossible to keep clean; the water-closets in the rear of some tenant-houses, which are often very offensive by reason of the leaders from the house-tops emptying into them during heavy rains; the presence of slaughter-houses in thickly-populated neighborhoods; vacant lots not fenced in, sunken lots with stagnant waters, the receptacles for the washings of water-closets, etc., as in Second Avenue, between Fifty-second and Fifty-third Streets; also in Fifty-sixth Street, between Fourth and Lexington Avenues, etc.

INHABITANTS.—The general character of the inhabitants is good. About three-fourths are the working-class, composed mostly of Germans and Irish. There are about an equal number of mechanics and laborers; the larger part have families depending on them.

BUILDINGS.—*Dwellings.*—About two-thirds of the dwellings in these districts are private residence; that is, dwellings containing less than three families. These houses are comparatively new, nearly all of them having been built within the past ten years. They are built mostly of brick, with brown-stone fronts. Average height three stories. The drainage is generally defective, the waste-pipes in most of the houses being

too small; many of the houses have no direct communication with the sewer. Some of the houses in the upper part of the ward have no cellars nor any means for ventilation under the basement floor. The water-supply is very good. The apartments and dormitories in nearly all of the private residences are of good size, large enough for health and convenience. The ventilation is by means of doors and windows. Gas is used almost universally for lighting. The water-closets of the private residences in the lower part of the ward are located in the house, in a small room off the hall of the second or third story, basement-floor, or in the cellar. In the upper part of the ward the water-closets are located mostly in the rear yard.

Tenant-Houses.—About one-third of the dwellings are tenant-houses. The larger proportion of these houses are located in the eastern section of the ward, viz., east of Third Avenue. They are built mostly of brick, and are comparatively new; a few are old wooden buildings. The average height is four stories. The drainage of these, as of the private residences, is generally defective. About half the houses have water faucets on each floor; the remainder have one hydrant in the yard, which supplies the entire house. The garbage and house-slops are variously disposed of; sometimes into barrels and small boxes, sometimes into garbage-boxes on the walks, but too frequently thrown into the streets and gutters, or into vacant lots. The larger proportion of the water-closets to these houses are located in the rear yard. Very few communicate with the sewer. Some of these are kept in a very filthy condition, especially if not under lock and key. The average number of rooms to each family is three. The average number of square feet of floor area to each person is 40. The average number of cubic feet of air-space to each person in apartments is 1,000. The ventilation in most of these houses is very defective. The bedrooms are mostly dark middle rooms, with only a small window two feet square opening into the hall. Some have no window at all, and the only means of ventilation is a door opening into the living-room, in which the family sit, cook, and wash. This room has generally two windows opening into the yard or street. The apartments are mostly heated by small cooking stoves, and the method of lighting is by means of kerosene oil.

The cellar-population of this ward is proportionately very small, the number being only 205. The average number of cubic feet to the cellar-population is 847.

The miserable ventilation of tenant-houses—the narrow halls and passages, which sometimes are found in not very clean condition, water-closets not kept in good order, defective drainage, the effluvia from old

wooden garbage-boxes on the walks, the filthy state of streets and gutters and of vacant lots not fenced in, dwellings built on the rear of lots, preventing a free circulation of air and diffusion of sunlight, water-closets placed in too close proximity to these rear houses. These and many other causes not only tend directly to deteriorate the health of residents of such tenant-houses, but also to imperil the sanitary safety of the city, and help to swell its bills of mortality. For special examples illustrating this, we would refer to our Sanitary Record-books of Sections 26th and 27th.

DRAM-SHOPS.—There are 200 places in the ward where liquor is sold. No brothels or gambling saloons exist here, as far as can be ascertained.

MARKETS.—There is no regular market in this ward. A good one is much needed, both on account of convenience and the public health.

FACTORIES.—There are about 40 factories in the ward, and scarcely any two of a kind, viz.: ink, piano-forte, comb, bone, iron, cloth, dyeing, varnish, paper, cabinet-makers, etc., etc. Most of these factories are small, and have very little influence on the public health. The ink factory in Sixty-first Street between First and Second Avenues, may be considered as a nuisance; it sends off from its chimneys a kind of soot, which renders the neighborhood quite objectionable. *There are* 14 *breweries in this ward.* They all communicate, except one, by drains with the sewer, and are kept clean.

SLAUGHTER-HOUSES, ETC.—Five slaughter-houses are located in this ward. The one in Forty-fifth Street between Third and —— Avenues is the most objectionable. It is located in the midst of a thickly-populated neighborhood; the entrails, manure, hoofs, etc., of the sheep and cattle slaughtered, are left standing in the yard two and three days to decompose. This is not only a nuisance, but a breeder of pestilence to the residents of this locality. Several cases of typhoid fever have occurred recently on this square.

There are 154 livery and private stables in the ward. These, as a general thing, are kept clean and in good order. We find 2 fat-boiling establishments in the ward, located at the foot of Forty-fifth Street, East River. These establishments were thoroughly inspected. They are considered as a great nuisance by the inhabitants of the whole district.

CHURCHES, ETC.—There are 21 churches, 3 public schools, 1 dispensary, 7 asylums and hospitals, and 1 college. All these institutions are in good condition.

PARKS, ETC.—A portion of the Central Park, Jones' Woods, Reservoir Park, and Hamilton Park, are located in this ward, and all kept in good condition. There are no public cemeteries, piers, basins, and a very few

wharfs in this section of the city. The vacant ground below Sixtieth Street is mostly fenced in. Sunken lots are the chief ground of complaint in this ward. They are mostly above Sixtieth Street, in a mixed sanitary condition; some of them are now being filled in.

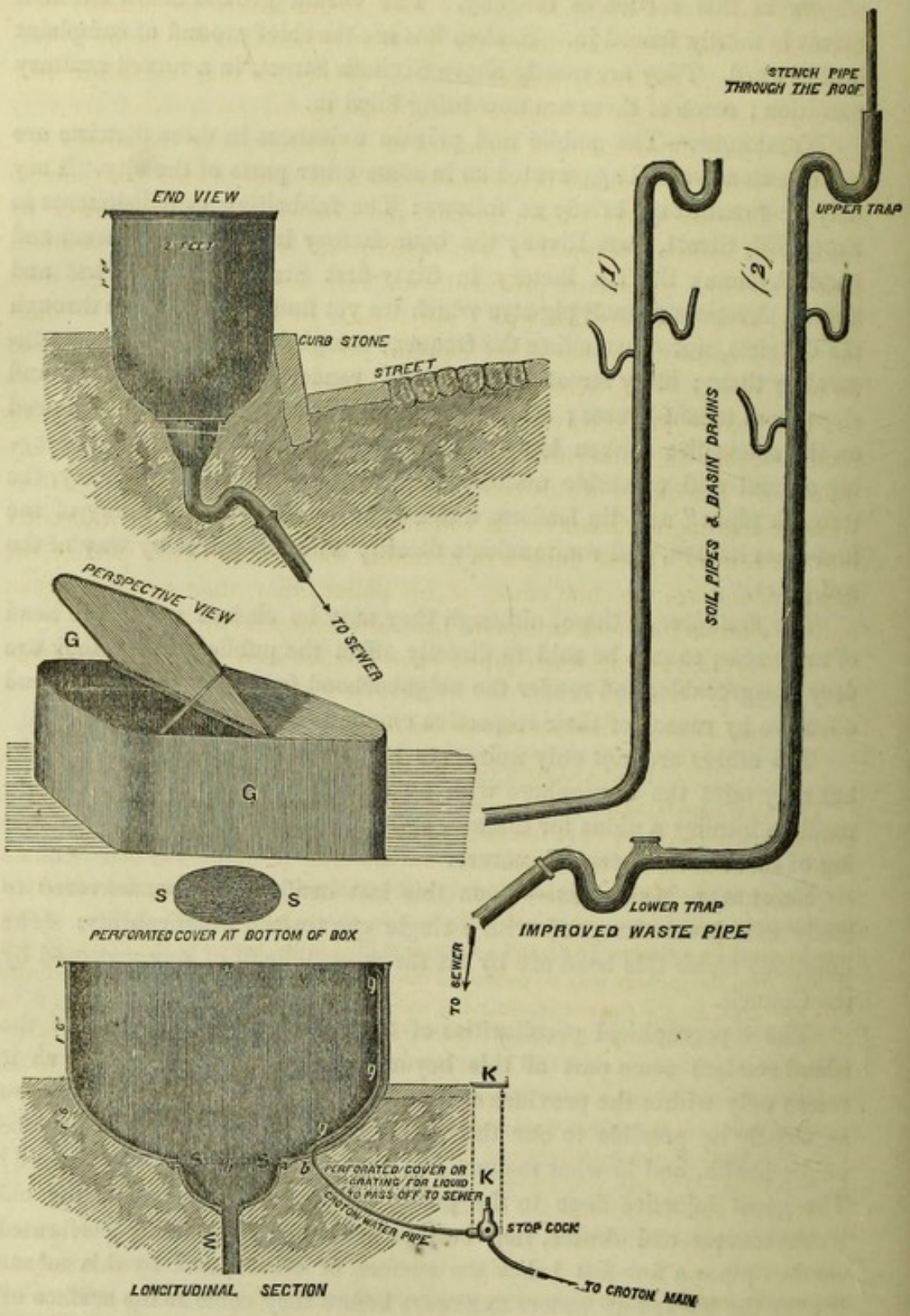
NUISANCES.—The public and private nuisances in these districts are not as extensive and aggravated as in some other parts of the city. They may be summed up briefly as follows: The fat-boiling establishments in Forty-fifth Street, East River; the bone factory in Fifty-third Street and First Avenue; the ink factory in Sixty-first Street between First and Second Avenues; small pig-stys which we yet find here and there through the districts, notwithstanding the frequent complaints of the citizens concerning them; filthy streets and gutters, rendered so by garbage and slops from tenant-houses; also, the modern wooden garbage-boxes placed on the sidewalk; sunken lots with pools of stagnant water, and decaying animal and vegetable matters; and we may add with propriety, the "stench pipes" and tin leaders, which open on the tops of many of the first-class houses, and communicate directly with the sewer by way of the soil pipes.

The *first three* of these, although they may be classed under the head of nuisances, cannot be said to directly affect the public health; they are very disagreeable, and render the neighborhood for many squares around offensive by reason of their respective emanations.

The others are not only nuisances by reason of the odors they emit, but they taint the atmosphere with an effluvium, which renders the immediate locality a nidus for disease, and a favorable place for the spreading of those of a contagious nature.

REMEDIAL MEASURES.—Upon this last head we have endeavored to study with great care, and with a single eye toward practicability. The questions under this head are by far the most difficult of any proposed by the Council.

The topographical peculiarities of the surface of this section of the island renders some part of this beyond our capability to advise, as it comes only within the province of a practical engineer. We shall adhere as closely as possible to our theme, viz.: does this and that affect the public health, and in what manner can causes of insalubrity be removed? The great injustice done to the public by the lack of care for the old water-courses and drains, may best be remedied by placing perforated earthen pipes a few feet below the surface of cellars, and by this means convey the backed-up waters to sewers before they come to the surface of the ground. We would suggest that those water-courses still remaining uncovered, be laid with these same pipes of a large size; and by this means obviate the danger of their being stopped up.



IMPROVED RECEIVING VESSEL FOR GARBAGE, AND IMPROVED SOIL-PIPE WITH DOUBLE TRAPS, ETC.

The gutters in front of second-class tenant-houses are usually in a very filthy condition, and under the present regulations can be no better. The poor have no ready means of doing otherwise than to throw their accumulated garbage in the gutters. Garbage-boxes of wood are very offensive, and the contents of them are often spread out in the streets.

We would recommend that a garbage-box be made of cast-iron, sunken in the sidewalk about twelve inches, and connected with the sewer by means of a soil-pipe trapped.* The bottom of this box to have a strainer, like what kitchen sinks are provided with, only much larger in proportion, and this box also supplied with Croton-water by means of a pipe entering within about 25 inches of the bottom. The box would also be closed on top by an iron lid, so as to cover the contents completely.

This fixture would leave tenement classes without an excuse for their filthiness, and the authorities might inflict punishment without doing any injustice. The object of this box is to furnish a receptacle for the garbage without creating a nuisance. It will also carry off the fluids of it directly into the sewer. These fluids are in reality the most offensive part of the garbage, and are the chief cause of complaint; they often run more than half-way around a block or square before reaching a culvert.

In the diagram of waste-pipes, page 332, is seen the plan we would

---

* *Improved Receiving Vessel for garbage and Improved Soil-pipe with double traps, etc.*

EXPLANATION OF THE FIGURES. (Page 332.)

THE CAST-IRON GARBAGE-BOX represented in this drawing is for the use of tenant-houses; dimensions, 2 × 4 × 3 (4 feet long, 3 feet deep, and 2 feet broad). The base of the vessel is of cast-iron, and the sides and two lids are made of thick boiler iron. The lids are hinged in the middle by means of a bolt. This will give strength, and will allow the lids to be raised from either end. The box is also to be somewhat oval, in the bottom, supplied by a strainer [S S], and a waste-pipe [W] to the sewer in the street, so that all fluid from the garbage may be conducted directly away. It is also to be supplied with CROTON-WATER, for the purpose of cleansing when the garbage is removed. This is to be in charge of the Collector of garbage; the water is to be turned on by means of a key reaching below the curb-stone [k k], the pipe to pass up through a covered groove [g g] inside of the box to within a few inches of the top, so that the box may be thoroughly cleansed daily. It is recommended that this box be sunken in the sidewalk, along the curb, to a depth of about 18 inches, or half its height.

SOIL-PIPES.—The pipe represented by Figure 1 is the one in use at present in the city.

Figure 2 with the stench-pipe is the one I recommend. It answers every purpose.

The stench-pipe runs from the top of the soil-pipe to the top of the house. It has two objects: first, to allow a full escape of gases through the soil-pipe; and second, it prevents the smaller traps in the dwelling-house from being exhausted of water when a large column of water descends through the soil-pipe. It is furnished with a large trap in the soil-pipe, a few feet from where it enters the drain from the house. This will prevent any sewer gases from rising through the dwelling, which is the great object to be accomplished.

recommend for running stench-pipes from the top of waste-pipes of dwellings, and extending them above the roof, to prevent water being exhausted from traps, and to carry off offensive gases that might return to apartments.

This in a most effectual manner makes a chimney for the sewer, and poisons the air with gases that we most desire to rid ourselves of. If the above pipe is required by reason of small-sized soil-pipes, we would recommend a trap to be placed in the soil-pipe on the cellar floor.

By this means the stench or gases cannot enter the house at all. This we would desire to be made a law; that every house should have a trap in the drain or soil-pipe on the floor of the cellar, so that if the smaller plumbing of the house should be defective, the noxious gases cannot enter and taint the air of dwellings. Typhoid fever, obstinate diarrhœa, and gastric difficulties, may thus be excluded to a great degree from private dwellings and tenant-houses.

This is but one of many improvements that seem to be immediately demanded in domestic hygiene; and whenever the principal Government or the State provides for the systematic investigation into the nature and causes of prevailing diseases, it will be found that a vast proportion of the most troublesome and fatal maladies arise from removable causes, and that they may be at once mitigated or altogether prevented.

Statistical Recapitulation.

Number of houses,	2,827	Dram-shops,	200
Number of squares,	276	Stores,	532
Private dwellings,	1,926	Factories,	40
Tenant-houses,	901	Breweries,	14
Shanties,	686	Slaughter-houses,	5
Cellar population,	205	Churches,	21
Population of the ward,	31,004	Public schools,	3
Adults,	16,918	Dispensary,	1
Children,	14,086	Hospitals and asylums,	7
Stables,	154		

REPORT

OF THE

TWENTY-EIGHTH SANITARY INSPECTION DISTRICT.

L. A. RODENSTEIN, M. D.,
Sanitary Inspector.

BOUNDARIES.—*This district is the northwestern section of the Twelfth Ward, and extends from Eighty-sixth Street to Spuyten Duyvil Creek, and from the Hudson River to Sixth Avenue;—a distance of* $5\frac{1}{10}$ *miles in length, and from* $1\frac{1}{2}$ *to* 1 *mile in width.*

In a district as extensive as this, including a greater variety of topographical conformations, of styles of buildings, of social conditions and modes of living, than any other district in the city, and at the same time covered by a population more unequally distributed and more widely scattered, it is more difficult to collect statistical information, and less satisfactory to draw conclusions from general averages. Full details would exceed the limits allowed to this report, and incomplete statistics might only mislead the reader.

Referring, therefore, to the detailed reports of my inspection, I shall here present only the great outlines and prominent features of this district.

TOPOGRAPHY.—The whole district may be represented as a gradually rising ascent, with abrupt and steep sides, whose highest point is Fort Washington. This slope is only interrupted by a deep cut or valley in which the village of Manhattanville is located. At one time a branch of the Hudson must have cut through the range of hills that extends the length of the Island, dug a bed for itself across, and filled with sand, gravel, and alluvium, the plain which extends from the western terminus of One Hundred and Thirtieth Street, through Manhattanville, along One Hundred and Twenty-fifth Street to Harlem River, and down around the elevations of One Hundred and Tenth Street to the southern part of the city.

The rest of the district is quite hilly. Primary rocks project everywhere through the superficial soil. The principal varieties are gneiss and granite. In the upper part of the district quite an extensive quarry of crystaline limestone may be seen. The soil is generally light and sandy, but in some of the lower depressions of the ground a rich vegetable mould may be found, and in a few places a strong black soil amply repays the gardener for his toil.

The general aspects of the country present still some of its natural scenery. A few streets have been cut through the hills, and a few of the avenues partly traverse the length of this portion of the Island. In the upper part of the district fresh country air may still be inhaled, and the luxury of rural enjoyments indulged in.

In this district no land has been made or reclaimed, except a strip of ground known as the "Manhattan Iron Foundry," which extends from 110 to 120 feet into the North River, and stretches from One Hundred and Forty-second to One Hundred and Forty-sixth Streets; it is composed of the refuse of the furnaces—a mixture of iron ore and silex—and exerts no perceptible influence upon the health of the neighborhood.

A number of small streams flow from the interior of the district to the Hudson or the Harlem River. The lowest of these water-courses takes its rise on the west side of Broadway and One Hundred and First Street, slowly winding its sluggish way through a piece of marshy ground to the Eleventh Avenue and Ninety-sixth Street, and then uniting with another branch empties itself into the river between the Eleventh and Twelfth Avenues.

Near the source of this stream is a pond of stagnant water, situated between One Hundred Third and One Hundred and Fourth Streets, and the Tenth and Eleventh Avenues; from it proceeds another stream, and on its way to the river makes those well-known marshes near the Bloomingdale Road, on One Hundred and Fourth Street between Tenth and Eleventh Avenues; on One Hundred and Thirty-eighth; in One Hundred and Forty-second and One Hundred and Forty-third Streets, other little rills flow in a more or less direct course toward the North River. A more considerable water-course takes its origin in One Hundred and Forty-ninth Street and Tenth Avenue, and runs parallel with the street to the west.*

As we approach Fort Washington, at about One Hundred and Seventy-fifth Street, we meet with a number of rivulets intersecting the country.

* The reader may consult the Sanitary and Topographical Map with reference to this section upon the medical topography of this district.—EDITOR.

At the extreme end of the Island where the waters of Spuyten Duyvil unite the Hudson and the Harlem Rivers, whole acres of marsh-land line the shore of the Creek. There, also, is an artificial water-course in that part of the Island, the canal or sluice which runs from the creek to the Harlem River.

At Two Hundred and Twelfth Street the Harlem River forms an inlet in which a considerable body of water pours itself from a stream whose source is on the east side of Eleventh Avenue near Two Hundred and Eighth Street. About thirteen acres are there covered with boggy ground. A belt of marsh extends along the whole course of the Harlem River down to McCombs Dam, but it does not form the immediate shore of the river; it lies rather to the rear and below the river height. The whole neighborhood is swampy. McCombs Dam is an inlet which cuts into the Eighth Avenue, extends from One Hundred and Fifty-fourth to One Hundred and Forty-ninth Streets; this place is subject to constant overflows by the tide-water. Further back, along the Sixth and Seventh Avenues, are other marshes covering several acres of ground. These are salt marshes, and being constantly subject to the action of the tide are not deleterious to health.

The pond of stagnant water formed by an old canal in this vicinity, constitutes an unmistakable source of sickness. This work was intended to sever the Island; it runs in a diagonal direction from One Hundred and Seventeenth Street and Sixth Avenue to Tenth Avenue and One Hundred and Twenty-fifth Street. Being found an impracticable undertaking, it has long since been abandoned; and as the avenues were extended to this portion of the Island, the canal was intersected and the excavations between the avenues have now become ponds of stagnant water. Into these basins the melted snow and the rains of spring are received, and when summer appears and "the Carrion-kissing god laps up the putrid wave," nothing remains but the foul sediments, whose noxious exhalations blanch the cheek of health. I have already in a detailed report enlarged upon this matter, and I cannot too emphatically call your attention to these insalubrious places; for as surely as the summer sun makes its appearance, so surely do remittent and intermittent fevers rise in the miasmata from the green surface of those stagnant pools, and afflict the people who live around them; nor are the inhabitants of this locality freed from these maladies until in the change of the seasons the ponds are filled and purified by the autumnal rains from "the sweet heavens."

Streets.—Only a few streets have been laid out in this district. Bloomingdale Road is still the main thoroughfare, extending from Eighty-sixth Street to Spuyten Duyvil Creek; it is a macadamized country road,

60 feet wide, has no sidewalks, and only dirt-gutters, which are generally filled up. The Eleventh Avenue is nominally opened from One Hundred and Ninth Street to One Hundred and Forty-fifth Street, and in a wretched condition. The Tenth Avenue is used for the aqueduct of the Croton-water, from High Bridge to One Hundred and Seventh Street; beyond the aqueduct the avenue has no improvements. The Eighth Avenue has, within the last month, been made passable for horse-cars to One Hundred and Twenty-fifth Street, and impassable for every thing else. Beyond One Hundred and Twenty-fifth Street to McCombs Dam Bridge it is a good hard road-bed for fast driving. The avenue presents no other hygienic advantages. Its gutters are receptacles for stagnant water, not for drainage. The Seventh Avenue is graded, guttered, curbed, and has one row of flags for its sidewalk. The Sixth Avenue the same. Eighty-sixth Street runs from Hudson River to Eighth Avenue; to the Tenth Avenue it is a rough country road; from thence to the Eighth Avenue it is curbed and guttered, and has a sidewalk. One Hundredth Street is partially opened, is in a most miserable condition, filled with filth of every description. One Hundred and Tenth Street extends from Bloomingdale road to East River, is now being graded, and is almost as wretchedly dirty as the preceding street. One Hundred and Twenty-third and One Hundred and Twenty-fourth Streets nominally extend from Sixth to Eighth Avenues; One Hundred and Twenty-fifth Street extends from Ninth Avenue to East River, 100 feet wide, macadamized, and makes pretensions to gutters and flag sidewalks. Manhattan Street intersects One Hundred and Twenty-fifth Street at the Ninth Avenue, and runs in a diagonal direction to the Hudson River, at One Hundred and Thirtieth Street. It is macadamized, guttered, and flagged. Laurence Street runs parallel with Manhattan Street; it is a country road with flagged sidewalks from Ninth Avenue to the river. One Hundred and Twenty-ninth Street is open from Ninth Avenue to the river, and from Eighth Avenue to Harlem. This is the only street which is paved; it is also guttered, curbed, and has flagged sidewalks. One Hundred and Thirtieth Street is opened from Ninth Avenue to the river, and has flagged sidewalks. One Hundred and Thirty-seventh Street is guttered and open from Broadway to the river. One Hundred and Fortieth and One Hundred and Forty-first and One Hundred and Forty-seventh Streets are country roads. One Hundred and Fiftieth Street is opened from Broadway to Tenth Avenue, and is in a filthy condition. One Hundred and Fifty-second and One Hundred and Fifty-sixth Streets are opened from Broadway to the river, and have good sidewalks.

I have been particular in enumerating these details, for they have

special bearing upon the health of the localities to which I would direct your particular attention—One Hundredth Street to One Hundred and Tenth Streets, from Broadway to Tenth Avenue. Also the district bounded on the south by One Hundred and Twenty-fifth Street, on the north by One Hundred and Thirty-second Street, east by Ninth Avenue, and west by the Hudson River.

One Hundred and Fiftieth Street, from Tenth Avenue to Broadway, and Croton Street, between Broadway and Eleventh Avenue, and between One Hundred and Seventy-sixth and One Hundred Seventy-seventh Streets, are the sewers in which disease displays its most fearful ravages, and mortality reaps its heaviest harvest; and here it is also where the streets are in the most shocking condition, and where the least attention is paid to those facilities and precautions which the requirements of public hygiene demand. Here huddled together are large numbers of human beings in close proximity with domestic animals. A man and his wife, with four, five, or six children, are crowded into a small shanty, with the pig-stye and a cow-shed adjoining, or a small house with four rooms and a basement is inhabited by five families with cats, dogs, geese, and goats; and a number of these dwellings are crowded together upon the smallest possible space. Filth reigns supreme within the houses, and offal, slops, and garbage are emptied into the streets, or thrown into the back yard, with no facilities for removing the accumulations of dirt and rubbish. There they remain day after day, week after week, breeding a foul and vitiated atmosphere which predisposes the beings who inhale it to every disease. These are the poor haunts of the district, where the poisoned air generates sickness, where malignant diseases are most prevalent, where even the most trivial indisposition often assumes a virulent character.

Sewers.—To remove the fruitful cause of disease a more extensive system of sewerage is required. There are at present but few sewers in this district. One extends from One Hundred and Tenth Street and Eighth Avenue to the East River. Another commences at the Tenth Avenue and Manhattan Street, empties into the Hudson, after it has effected a junction with one running from Broadway through One Hundred and Thirtieth Street. The last begins at Tenth Avenue and runs through One Hundred and Forty-second Street into the North River. These are all of the oval shape, and constructed in the most approved style. They are excellent but not sufficient, for a district which embraces 819 squares.

Squares.—Only 369 squares have yet been laid out, the others (450 in number) present still the undisturbed conditions of a rural district.

By far the larger part may therefore be represented as in a salubrious

state; for naturally there are few local causes of sickness in the upper portion of the Island, the succession of hills, and the declination of the valleys toward the rivers, furnish facilities for natural drainage which are sufficient to carry off any ordinary deposits. But in those portions of the district in which the natural conformation of the surface has been disturbed by the art of man which makes the city, and makes it badly; where the natural elevations and depressions have been obliterated by gradings, and streets have been opened without gutters or insufficient drainage; where avenues have blocked up the natural flow of streams; where the squares between streets are pits, and streets look like causeways over abysses; where an incipient city defaces Nature, and deprives it of its own provisions for restoring the equilibrium of its disturbed elements, and art has not yet provided any substitute for the natural outlets of accumulated moisture; there we find the habitats of malarious fevers, and the undertaker's great market-places for small coffins.

Where the district still preserves the air and appearance of the country, the handsome residences of the wealthy are located, and these localities are generally healthy. But the laboring classes are compelled to seek the cheaper tenements in the shanty villages upon undeveloped streets; they build their shanties on sunken squares filled in wet weather with standing water, and were it not for the Celtic brogue which salutes your ear, you might take them for some of the old Dutch settlers who still wished to perpetuate in a small way the memory of their ancestral dykes and canals.

Inhabitants.—The inhabitants of the district belong generally to the poorer and laboring classes. Along the banks of the Hudson are the stately mansions of the rich, with the usual complement of domestic servants, gardeners, hostlers, coachmen, stable-boys, etc. The inner portion of the island is dotted with public institutions and small settlements of laborers. The Irish predominate, and next come the Germans; other nationalities are also represented. Many of them work in the Central Park, others in the factories, foundries, or on the public roads.

Buildings.—The dwellings of the laboring classes are the usual tenant-house and the shanty. Cleanliness is their great want. In such streets as One Hundreth, One Hundred and Tenth, and Laurence Street, and others, the accumulations of garbage, slops, and filth, are indescribable. In those localities a dense population is closely huddled together. As we drive along the Bloomingdale Road as far as Fort Washington, and view the elegant residences beyond the extended lawns and gardens that skirt the road, it seems improbable that almost opposite to one of the handsomest lodges and finest residences the most loathsome and filthy lane of

the island extends; and yet in Croton Street are more human beings crowded together than inhabit all the proud mansions that crest the banks of the Hudson from one end of the district to the other. The packing of that little street can only be equalled by a Third Avenue railroad car. Men, women, and children, dogs, cows, pigs, goats, geese, ducks, and chickens are almost promiscuously mixed together. The street is rank with filth and stench, and the consequence is that mortality holds high carnival there; and diseases which are comparatively trivial, and readily yield to remedies in better homes in the immediate neighborhood, in this street, unsewered, unguttered, reeking with filth, destitute of Croton-water, assume a virulent character, and not unfrequently defy all treatment.

The dwellings of this district are of a very diversified description. They consist of 229 family residences, and are generally spacious wooden buildings. Gas has been introduced into most, Croton into some, and all have sinks for water-closets.

Tenant-houses.—There are 42 large tenant-houses, 710 *single* tenant-houses, and 313 shanties. The latter two classes of buildings are very slightly built, many have the evident marks of wear and tear; there is generally no water drainage, no removal of garbage, and the water-closets are built on the top of the ground. There are 121 saloons; of these 14 are hotels. There are 107 dram-shops; filthy holes where the worst of intoxicating liquors are sold. They are "dispensaries of poison." We have in this district in addition, 1 paint factory, 1 candle factory, 2 iron foundries, 1 sugar refinery, 2 breweries. To these establishments there can be no objection from a sanitary point of view. Contrary to what might be expected, the workmen of the paint factory are exceedingly healthy. Some of the operatives have grown old in the service; some have worked there twenty-five, others twenty years. In former years "painters' cholic" was prevalent among them, but since the lead is being *ground under water, or in oil*, which prevents the particles from flying into the air, the factory has been singularly free from that malady.

Slaughter-Pens.—There are 7 slaughter-houses in the district. Those in Manhattanville are badly kept, and have been complained of as nuisances.

Public Institutions.—Of public buildings we have 13 churches, 4 public schools, 1 college (Manhattanville), the "Sheltering Arms" (a charitable institution), 1 Deaf and Dumb Asylum, 1 Colored Orphan Asylum, 1 Insane Asylum, the Leake and Watt (Orphan) Asylum, the Convent of the Sacred Heart, and the Manhattanville Dispensary. All these institutions are conducted in an admirable manner with regard to the ob-

servance of hygienic principles. Trinity Cemetery is one of the best kept interment grounds, and has no perceptible influence on public health.

PREVAILING DISEASES.—The following diseases have prevailed during the last season: Cholera infantum has prevailed very fatally in One Hundreth Street, between Broadway and Ninth Avenue; and out of 33 cases, 19 have terminated fatally. In Manhattanville the same disease, with the same general characteristics, has been attended by the same fatal consequences. We have to contend with many disadvantages in the practice of medicine among the laboring population who inhabit these neighborhoods. They are chiefly Irish and Germans of the lower class, and the evils we have to encounter arise partly from the moral dispositions of these two nationalities. The Irish, with their proverbial carelessness, will act utterly heedless of medical advice; neglect and absolutely expose their children to inclement weather in winter, or the vertical rays of the sun in summer. The Germans, on the contrary, can never be careful enough; close, overheated rooms, feather beds above and beneath them, and exclusion from the fresh air, they deem essential to the treatment of their sick. Of the two evils I prefer the Irishman's carelessness; for the patient has at least a chance of getting fresh air, while among the Germans I have known patients to be actually smothered to death. This is merely a few of the single circumstances which increase the fatality in the two localities to which I have here referred. The crowded condition of the houses, with the close, vitiated atmosphere, is another which accelerates the fatal progress of disease; but I may state it as my deliberate opinion, that the noxious vapors and miasmatic exhalations from stagnant water, and the foul effluvia from decaying vegetables and putrid offal, contribute more than any other causes to the production of malarious fevers, and the malignant and fatal tendency of diarrhœal and other diseases, which, under other circumstances, yield readily to medical agencies. For illustrations I have here pointed to those two localities. They are alike in every particular, and although separated by the distance of a mile and a half, they correspond in all the main conditions that affect their salubrity. They are of the same elevation, populated by the same class of people, surrounded by the same sources of miasmatic influences, pools of stagnant water, the inhabitants occupy the same class of buildings, live in the same kind of overcrowded, over-heated rooms, and are addicted to the same unfortunate habits of drinking. The streets are distinguished by the same general features of filth; of course the same results follow in both places. Cholera infantum has made havoc among the children of these neighborhoods. Diphtheria prevailed last year, and was very fatal, and the scene of its devastation was the very region where cholera infantum proved so fatal.

MIASMATIC FEVERS.—Any one exposed to the miasmatic influence of marshy lands is liable to contract these, the rich and the poor; those living on the highest points of the district, and those who live on the level with the rivers, have alike been more or less afflicted with these fevers.*

Statistics of intermittent fevers extracted from the Manhattan Dispensary record:

During the month of		May	one in every	3.33
"	"	June	"	3.50
"	"	July	"	3.25
"	"	August	"	3.67
"	"	Sept.	"	3.20
"	"	Oct.	"	2.50
"	"	Nov.	"	4.75
"	"	Dec.	"	5.20

But there is a fact in the history of diseases here which ought not to escape our observation. In those insalubrious localities to which I have referred, malarious disease assumes a peculiar phase, and displays decided typhoid characteristics. And being already predisposed to disease, with a body enfeebled by deep and oft-repeated draughts of villanous

* The inspector of the Twenty-eighth District has submitted a very carefully-prepared map to illustrate the medical topography of that important section of the island from recent surveys, the essential points of which will be found upon the Sanitary Map at the beginning of this volume. A supplementary report upon the sickness and mortality records of the public institutions in that district has also been submitted. As the latter is too lengthy for publication in this volume, we present the following abstract of some of these records to illustrate the practical bearing of Dr. Rodenstein's suggestions respecting the causes of malarious diseases in the upper portion of the island:

The average number of patients in the *Bloomingdale Lunatic Asylum*, the past year, has been..... 162
Total number of Do. sick with malarious fever in Do..... 16
Total number of inmates of the *Leake and Watt's Orphan Asylum* is..... 169
Is located on improved grounds, One Hundred and Tenth Street, Ninth and Tenth Avenues. No malarious fever reported.
Total number of inmates in the *Juvenile Asylum*..... 505
Is located on most elevated grounds at Fort Washington. Reports but 98 cases of sickness during the year, and but one case of malarious fever.
Total number of children in the *Colored Orphan Asylum*..... 209
Is located on One Hundred and Fifty-first Street, North River. Total number of cases of sickness, 196; number of cases of malarious fever. 33

—EDITOR.

liquors, and a low degree of vitality induced by unwholesome food, etc., they fall easy victims to the ravages of fever.

The progress of small-pox infection has been checked by vaccination. For a short time typhoid fever spread very rapidly in One Hundred and Tenth Street. This street extends from Broadway to Tenth Avenue, and on each side is a row of small *single* tenements numbering in all about 27. Each has four small, badly-ventilated rooms, lighted by kerosene, and heated by stoves. The street has neither pavement nor gutter. The garbage and slops are thrown in front of the houses. Here, then, was the fuel for fever; the spark was added by the importation of a case of typhoid fever from the army. In a very short time about one-tenth of the population were seized by the fever, and about one-fourth of these died.

In concluding this report, if I were to suggest any remedial measures, I should simply ask, let there be no new contracts granted for the opening of new streets until some security is given that their improvement will be completed in such manner as to preserve the public health. The few streets that now exist in this district should be paved and guttered; the ponds and marshes and all stagnant waters should be thoroughly drained to the rivers, and the low places filled up. Sewers, or a proper system of dry-gathering in garbage and waste-carts, should be provided, and, most important of all, there should be an efficient medical or sanitary police on daily duty.

REPORT

OF THE

TWENTY-NINTH SANITARY INSPECTION DISTRICT.

JOSEPH O. FARRINGTON, M.D.,
Sanitary Inspector.

BOUNDARIES.—*North by Harlem River, east by the East River, south by Eighty-sixth Street, and west by the Sixth Avenue.*

Harlem, and the greater part of Yorkville, are included in this district. The lay of the land is, with the exception of the southern margin, remarkably level. The elevated portion includes a tier of squares bordering on Central Park and Eighty-sixth Street, and the single square known as Mount Morris. With the exception of these parts the entire district lies but little above the tide-level, and has very much the appearance of having been originally *submerged*. The evenness of the surface, the alluvial character of the deposits, the direction of the water-courses still remaining, the absence of forest trees, all indicate that the water once flowed across the island from the North River through the gap at Manhattanville to Hell Gate. In fine, the topography of the district is just such as to have gladdened the eyes of the original Dutch settlers. It must have forcibly reminded them of their almost inundated fatherland, and accounts for its receiving the name of Haarlem, after one of their principal cities.

STREETS.—The avenues run northeast and southwest, and the streets cut them at right angles. The former are all 100 feet wide except the Fourth Avenue, which is 140. The streets are 60 feet in width, with the exception of a street at an interval of every half mile, which is 100 feet, *e. g.*, One Hundred and Twenty-fifth Street and One Hundred and Sixteenth Street.

One Hundred and Twenty-ninth Street is paved with cobble stone, and

the Third Avenue is macadamized. The other streets and avenues are simply graded.

SEWERAGE.—The few sewers constructed are all of the oval kind, and have their outlets above low-water.

SQUARES.—The whole number of squares and parts of squares is 256. Of these fully 200 are in a good sanitary condition, well-drained and free from any sources of preventable disease and mortality. The remainder, in consequence of their being low and sunken, or containing ponds of stagnant water, are in a mixed sanitary condition. On and around all these last-named squares there is a tendency to intermittent fever, and they will continue to be insalubrious until the streets are sewered and the ponds drained or filled up. Wherever this has been already done the Inspector has observed a marked improvement in the health of the inhabitants.

INHABITANTS.—It would probably be safe to say that the population of the district has doubled during the last five years. This has been mainly due to the increased facilities for travel afforded by the Second and Third Avenue Railroads and the Harlem line of Steamboats. The nationalities represented are about equally the American, the Irish, and the German. The American element is fully equal to all others combined, and the laboring class embraces about one-half the entire population. The general character of the inhabitants is that of a well-to-do, law-abiding, orderly, and church-going community.

BUILDINGS.—The whole number of houses is 1820. Of these 1,360 are dwellings, occupied by one or two families; 160 are tenements, containing three or more families; 110 are drinking saloons; 172 grocery or other stores, and 19 markets. There are also 330 shanties, occupied by Irish families, who are known as "squatters." They locate upon unopened streets or vacant lots, build their rude one-story cabins, raise children, pigs, and potatoes, and maintain their *squatter sovereignty* until compelled by the city or proper owners to *vacate* the premises.

The district being beyond the fire-limits, the principal material used in building has been wood. At present, however, brick and brown-stone are more in demand, and whole blocks of substantial brick and stone dwellings have already been erected. Nearly all the houses have gas and Croton-water, and those of recent building contain all the modern improvements.

About *one* house in every *eleven and a half* is a *tenement*. The general character of these tenements, which contain, on the average, five or six families, is good. Their location, ventilation, water-supply, and drainage, are, on the whole, conducive to the health of the inmates. They are

rarely overcrowded, and present few, if any, of the objectionable features of houses of a similar kind in the heart of the city.

The whole number of *drinking saloons* is 110, or *one* for every *sixteen and a half* houses. Of these fully one-half are common dram-shops.

NUISANCES.—Ponds of stagnant water constitute the worst nuisances. They are found on some of the low and sunken squares, and which, as above remarked, exert a deleterious influence upon the health of those living near them.

DISEASES.—With the exception of intermittent fever there has been no prevailing disease during the past season, and this has been chiefly confined to the insalubrious squares indicated as low and sunken.

The condition of the streets and gutters has also, through the praiseworthy exertions of Mr. Thomas Miller, the efficient Deputy Street Inspector, been much improved, and other causes of insalubrity would at once be removed if he had the power to act.

IMPROVEMENTS.—During the past year the following improvements of a noteworthy character, as bearing upon the sanitary condition of the district, have been made. A large pond of stagnant water in Second Avenue, near One Hundred and Fourteenth Street, has been filled up. Also a similar pond on the First Avenue, between One Hundred and Twenty-first and One Hundred and Twenty-second Streets, has been drained by laying a pipe from it to the sewer in One Hundred and Twenty-second Street. The following sewers have likewise been built: In One Hundred and Twenth-ninth Street, from the Sixth to the Third Avenue; in Third Avenue, from One Hundred and Eighteenth Street north to the river, or more than half a mile long; in Third Avenue, from One Hundred and Tenth to One Hundred and Eighth Street, where it connects with the "Harlem Canal;" in One Hundred and Twenty-fifth Street, from Third Avenue east to the river; and in First Avenue, from One Hundred and Tenth to One Hundred and Eighteenth Street, and through the last-named street to the river.

REMEDIAL MEASURES.—The undersigned would recommend the speedy filling up of all low and sunken lots, the draining of ponds of stagnant water, and the sewering of the avenues and streets adjacent to the squares which are positively insalubrious. When this is done the district will compare in general healthfulness with any other on the Island.

Tabulated Statement.—The following table will exhibit at a glance the statistical results of the inspection, the whole district being divided into eight belts by the avenues, and extending from the river south to

Eighty-sixth Street. (See Map in front of "*Sanitary Inquiry*," District No. 29, Twelfth Ward.)

Statistical Recapitulation.

	Squares.	Houses.	Shanties.	Rear Buildings.	Tenant-Houses.	Dram-Shops.	Stores.	Markets.	Factories.	Stables.	Churches.	Schools.
1st Belt (bet. 6th and 5th Avs.)	28	120	6	4	5	1	1			20	2	
2d Belt (bet. 5th and 4th Avs.)	50	246	192	26	30	21	5	1	2	51		
3d Belt (bet. 4th and 3d Avs.)	46	722	80	48	81	50	97	8	9	64	9	1
4th Belt (bet. 3d and 2d Avs.)	45	434	8	19	36	31	65	8	3	54	4	4
5th Belt (bet. 2d and 1st Avs.)	42	88	19	14	6	4	2		1	31	1	
6th Belt (bet. 1st Av. and Av. A)	28	122	23		2	3	2	2	3	13		
7th Belt (bet. Avs. A and B)..	15	87	2						2	20		
8th Belt (bet. Av. B and river)	2	1								2		
Totals.....	256	1820	330	111	160	110	175	19	20	255	16	5

Statistical Summary of the Tenant-Houses and Cellars, and the Distribution and Statistics of their Population, etc., in the City of New York, at the close of the year 1864.

WARDS.	Total No. of Tenant-Houses.	Total No. of Families in Tenant-Houses.	Average No. of Families in each House.	Total Population in Tenant-Houses.	Average Population in each House.	Total Cellar Population.	Total Population in Cellars and Tenant-Houses.	Total No. of Tenant-Houses without Sewers.	Total Population in Unsewered Houses.
First	250	2,181	8½	8,564	34¼ +	498	9,062	89	2,606
Third	54	310	5¾	1,248	24⅕	57	1,305	28	640
Fourth	486	3,636	7½	17,611	35¼ +	346	17,957	151	4,473
Fifth	462	2,597	5⅝	10,370	24¾ +	836	11,206	293	5,796
Sixth	605	4,406	7¼	22,401	34½ —	496	22,897	214	6,612
Seventh	627	4,586	7⅓	19,293	30⅛	1,233	20,526	409	10,953
Eighth	625	3,977	6⅜	15,630	25 +	1,258	16,888	302	6,530
Ninth	596	3,836	6⅜	14,955	25⅛	217	15,172	208	4,485
Tenth	534	4,487	9	18,140	34 —	453	18,583	110	2,953
Eleventh	2,049	13,433	6½	64,254	31⅝	1,366	65,620	403	10,026
Thirteenth	540	3,729	6⅞	14,997	27½	939	15,936	215	5,089
Fourteenth	546	4,509	8¼	20,008	36⅝	417	20,425	207	6,202
Fifteenth	197	1,358	7	4,970	25 —	235	5,205	72	1,237
Sixteenth	1,257	7,088	5⅝	31,500	25 +	2,150	33,650	300	7,107
Seventeenth	1,890	15,974	8½	68,766	34⅜ +	2,441	66,207	155	4,596
Eighteenth	836	7,267	8¾	35,869	42⅞	230	36,099	98	3,766
Nineteenth	571	3,632	6⅜	16,067	28⅛ +	205	16,272	81	1,912
Twentieth	1,162	8,344	7⅛	32,205	27½	1,013	33,218	291	7,968
Twenty-First	1,026	7,299	7	36,675	35⅞ —	135	36,870	144	4,491
Twenty-Second	996	7,714	7¾	31,845	32 —	699	32,544	162	3,233

This Table presents the Statistics of Tenant-Houses, as reported by the Sanitary Inspectors of the Council of Hygiene, and verified in a recent inspection by the Metropolitan Police.

The total number of tenant-houses, none of which contain less than three families, who hire their apartments by monthly or very brief periods of rental, is **15,511.** This exceeds, by 202, the number which the Council of Hygiene as well as the Metropolitan Police has elsewhere given.

The total population of these tenant-houses at the time of last inspection, was 486,000
The total population in cellars was..... 15,224
Total in tenant-houses and in cellars.....**501,224**

Note.—The Sanitary Inspectors of the Twelfth Ward report that there are 202 tenant-houses of the larger class (averaging more than six families in a house) in that Ward. In the same Ward there are 643 inhabited *shanties*, and 710 other tenements of a poor class, but not having three families each, consequently not counted in the statistics of tenant-houses.

INDEX.

ABBATOIRS, of Paris, described as Sanitary Institutions, &c., xciv.

ACCIDENTS on the city railroads, generally caused by intemperance, 310.

ACHISON, Dr. J. C., Sanitary Inspector, 110; on the medical topography of the Thirteenth Ward, 111; classification of buildings by, 112; prevailing diseases—reactive evils by, 113; remedial measures suggested by, 114; when reforms must begin, 115.

AGGREGATION of population in cities, xxxviii; of tenant-houses and its evils, cxxxii.

ALCOHOLIC DRINKS, bad quality of, 10, 54, 137, 167, 201, 214, 311; poisonous air in crowded tenements begets a desire for, 54, 221; diseases induced by the use of, 55, 81, 123, 137, 201; consumed at unreasonable hours, 137; indulged in by numbers of both sexes, 167, 250; lead to riot, misery, and crime, 214, 250; habitual use of, renders diseases more apt to terminate unfavorably, 311.

AIR, how poisoned in dwellings, cxxxiii–cxxxiv.

ALLEYS, filthy condition of, 101, 179; dampness of, 137; used for surface drainage, 188; inaccessible between rear tenements, 193; in the nineteenth district, 225.

APARTMENTS, dimensions of, 7, 39, 47, 68, 86, 121, 149, 190, 198; filthy condition of, in tenant-houses, 68; defective ventilation of, 101, 190, 244; overcrowding of, 271; its effects upon children, 271; effluvia in, 199, 243; of rear tenements, 244; want of light and ventilation in, of rear tenements, 245.

ASSOCIATION for Improving the Condition of the Poor, its sanitary work and advice, lxxii—lxxiv; its special report on sanitary wants of the laboring classes, lxxxiii.

ASSYLUMS, the Lying-in, 89; the Half Orphan, 138; Home for Young Women and Children, 139; for Soldiers' Children, 315; Deaf and Dumb, 341; Colored Orphan, ib.; Insane, ib.; the Leake and Watt (Orphan), ib.

ATMOSPHERE, moisture of, in the First Inspection District, 36; in rear tenements, 48; the number of cubic feet of, to each individual among the tenant-house population, 48, 150, 190, 242; humidity of, as affecting health, 165; impregnated with sewer gases, a well-known source of disease, 223; amount of to each individual among the cellar population, 247; effects of impurity of, 258; amount of, breathed per hour, 258, xc.

BALLARD, Dr. E., of London, his report on the working of the Metropolitan system, cxv.

BARTON, Dr., quotations from, 203.

BASEMENTS, untenantable from dampness, 3, 5, 14, 55; population of, 152; unhealthy nature of, 190; typhoid fever in, 55; rheumatism contracted in, 3, 40, 71, 81, 199; ophthalmia in, 71.

BEEKMAN'S SWAMP, location and area of, 43.

BERWICK, ENG., results of sanitary works in, cxvii.

BESTAVER'S KELLITJE, 128.

BOARDING HOUSES, 25; sailors', how sometimes supplied with food, 60.

BRONCHITIS, among the occupants of shanties in the Twenty-fifth Inspection District, 306.

BROTHELS, in the First Inspection District, 10; in the Third, 26, 37; in the Fourth, 59; in the Fifth, 67; in the Sixth, 81; in the Seventh, 86; in the Twelfth, 138; in the Thirteenth, 154; by whom frequented, 10; difficulty of distinguishing, 26.

BROWN, Dr. J. L., Sanitary Inspector, 116; on the primitive and present topography of the Eleventh District, 117; objections to the cobble pavement by, 118; on an outbreak of typhoid fever and dysentery by, 119; on tenant-houses, 121; description of an improved tenant-house by, 122; cellar population by, 123; on garbage boxes, 124; prevailing diseases, ib.; remedial measures suggested by, 124.

BRUSH, Dr. H. M., Sanitary Inspector, 385; on natural water-courses of the Twenty-sixth and Twenty seventh District, 326; old water courses obstructed, 327; the evils of sewer gases, 328; on tenant-houses, 329; evils and their remedies, 321; foul gutters and poisonous gases, 333; garbage-box and waste-pipe proposed by, 333.

BUILDINGS, of the First Inspection District, 6; of the Second, 15; of the Third, 25, 38; of the Fourth, 45; of the Fifth, 67, 70; of the Seventh, 86; of the Eighth, 93; of the Ninth, 100; of the Tenth, 112; of the Eleventh, 120; of the Twelfth, 132; of the Thirteenth, 148; of the Fourteenth, 166; of the Fifteenth, 173; of the Sixteenth, 186; of the Seventeenth, 197; of the Eighteenth, 210; of the Twentieth, 241; of the Twenty-first, 257; of the Twenty-second, 276; of the Twenty-third, 286; of the Twenty-fourth, 291; of the Twenty-fifth, 300; of the Twenty-sixth and Twenty-seventh, 328; of the Twenty-eighth, 340; of the Twenty-ninth, 346; effects of high, on the sanitary condition of narrow streets, 16; sanitary condition of old, often superior to those of more recent date, 112; defective construction of, 287.

BURRALL, Dr. F. A., Sanitary Inspector, 127; on the sources of insalubrity in the streets of the Twelfth District, 129; sewerage and health statistics by, 131; classification of buildings by, 132; tenant-house statistics by, 134; objectionable features of the Twelfth District, 137; on the construction of churches and public schools, 139; on diseases prevailing in the Twelfth District, ib.; remedial measures suggested by, 140.

CASTLE GARDEN, 11; effects of, on the sanitary condition of the city, 12.

Cat-Alley, description of, 179.
Causes of Disease, xlvii; considered in connection with death-rates, xlviii; necessity for guarding against in New York, ib.; those which are external and those that are personal considered, xlix; localizing nature of, lxii.
Cellars, dampness of, during high tide, 3, 22, 40, 146; from deficiency of drainage, 144, 224; excluding light and air from, 40, 103; population of, in the Sixth District, 80; in the Thirteenth, 152; in the Twentieth, 246; in the Twenty-sixth and Twenty-seventh, 329; flooded by heavy rains, 123; diseases prevailing in, 135; filthy condition of, 191; rheumatism in, 199; should be prohibited as dwellings, 205; darkness of, a cause of impaired vitality, 212; diseases conveyed from, 224; amount of population of, diminishing, 247; offensive odor arising from, 307; blood poisoning from, ib.
Cemeteries, in the First Inspection District, 12; in the Fourth, 59; in the Sixth, 82; in the Eighth, 96; in the Thirteenth, 159, 163; in the Fourteenth, 168; in the Twenty-eighth, 342.
Chadwick, Edwin, Esq., remarks on particular reforms, cxvi.
Charitable Institutions, in the Sixth Inspection District, 87; proximity of, to fever-nests, 82.
Chemistry, hygienic applications of, xcviii—ciii; report on, by Profs. Draper and Doremus, xcix.
Cholera, Asiatic, first appearance of, in 1849, 84; in the vicinity of pig-styes, 309; its history in New York, lxiii; in Philadelphia and Boston, lxiv; seeks the insalubrious localities, 320.
Cholera Infantum, in the First Inspection District, 12; in the Third, 41; in the Sixth, 82; in the Eighth, 96; in the Tenth, 113; in the Eleventh, 124; in the Twelfth, 138; in the Thirteenth, 162; in the Fourteenth, 168; in the Fifteenth, 179; in the Sixteenth, 193; in the Seventeenth, 199; in the Twentieth, 248; in the Twenty-fourth, 294; in the Twenty-fifth, 312; in the Twenty-sixth and Twenty-seventh, 327; in the Twenty-eighth, 342; in connection with stables and offensive water-closets, 41; prevalent in rear tenements, 179; relation of, to filthy streets and gutters, 183, 327; to dram-shops, 186; fatality of, in rear tenant-houses, 249; in the vicinity of slaughter-houses, 294; caused by swill milk, 312; in the vicinity of stagnant water, 316; fatality of, in the Twenty-fifth District, 320; relation of, to dentition, 322; in Manhattanville, 342.
Cholera Morbus, in the First Inspection District, 12; in the Third, 29; in the Eleventh, 124; caused by unwholesome articles of food, 312; its preventable nature well known, 320.
Churches, in the First Inspection District, 11; in the Second, 17; in the Third, 28; in the Fifth, 72; in the Sixth, 81; in the Eighth, 96; in the Ninth, 101; in the Tenth, 112; in the Eleventh, 125; in the Twelfth, 138; in the Thirteenth, 148; in the Sixteenth, 192; in the Eighteenth, 222; in the Twentieth, 241; in the Twenty-second, 278; in the Twenty-sixth and Twenty-seventh, 330; badly ventilated, 81, 139.
Citizens' Association, information and advise requested by, xxxv; report presented to, xxvii.
Cleanliness, the first remedial measure for the city, cxxv, cxxxviii; should be enforced in tenant-houses, cxxxi; importance of both personal and domiciliary, 113, 166; neglect of, 166; with ventilation, will extinguish epidemics, 213; indifference to, acquired, and at variance with all moral or social improvement, 245; want of, a great source of insalubrity, 272; the great want of, in the Twenty-eighth District, 340.
'Collect,' outlet of, 21, 34; description of the, 75; filling-in the, 76; an incident, ib.; noxious influence of the, 92.
Commercial Warehouses, sanitary wants of, 16; effects of their want of ventilation and light, ib.
Commission, form of, to Sanitary Inspectors, xxviii.
Contagion, and contagious diseases considered, cxxxv.
Council of Hygiene, date of its organization, xxi; names of its members, cliii.
Crime resulting from a want of sanitary regulation, 65; from habitual intemperance, 137, 167, 214, 250.
Croton Street, packing of, 340.
Croton Water, its sanitary importance, lii; occasional impurities of, and their influence, c.
Croup among the occupants of shanties in the Twenty-fifth Inspection District, 306.
Culs-de-Sac, diseases and mortality in, lxxvi.
Death-Rates, defined, xl; its average in the Sixth Ward, lxiv.
Derby, Dr. E. W., Sanitary Inspector, 165; on the effects of a vitiated atmosphere, 166; on tenant-houses and dram shops, 167; on the moral influence of slaughter-houses, 168; how infectious diseases spread, 169; remedial measures, suggested by, 170.
Diarrhœa, in the First District, 12; prevalent at all seasons in the Fourth District, 63; existence of, among cellar population, 71; most prevalent in insalubrious quarters, 12; its prevalence near the river, 29; most severe on low, damp ground, 41; with drunkards, running into dysentery, 169; connected with filthy streets and gutters, 183, 327; in the Sixteenth District, 193; in the Twentieth, 248; may be controlled by proper sanitary regulations, 319.
Diarrhœal Maladies, lii, liii; their causes preventable, cviii; from open and neglected sewers, cviii; from impure water, cix; Dr. Greenhow's report on, cix.
Diphtheria, proximity of, to stables, 27, 62, 225; in connection with dram-shops, 186; with insalubrious slaughter-houses, 192; with flooded cellars, 199; death of a physician by, 225; in the vicinity of stagnant water, 342.
Disease, avoidable causes of, xxxix; preventable, the proportion of deaths from, lii; causes of in Tenth, Eighteenth, and Twentieth Districts reported, lxvi; special reports on, in a Park Street *cul-de-sac*, lxxvi; report on, in certain tenant-houses, lxxviii; in the First Inspection District, 12; in the Second, 17; in the Third, 29, 41; in the Fourth, 63; in the Fifth, 68, 72; in the Sixth, 82; in the Seventh, 89; in the Eighth, 96; in the Ninth, 107; in the Tenth, 113; in the Eleventh, 124; in the Twelfth, 139; in the Thirteenth, 162; in the Fourteenth, 168; in the Fifteenth, 179; in the Sixteenth, 193; in the Seventeenth, 199; in the Eighteenth, 215; in the Nineteenth, 224; in the Twentieth, 248; in the Twenty-first, 265; in the Twenty-second, 279; in the Twenty-fourth, 294; in the Twenty-fifth, 318, 319; in the Twenty-Sixth and Twenty-Seventh, 328; in the Twenty-eighth, 342; in the Twenty-ninth, 347; existence of, concealed by interested persons, 62; zymotic rife in the vicinity of large stables, 62; statistics of a tenant-house in Monroe Street, 104; influence of dirty streets in the spread of, 111, 113, 129; caused by the use of alcoholic liquors, 123; dispelled by the diluting agency of the atmosphere, 124; spread by means of the city rail-cars, 141; by fomites, 163, 249; localities of, 193; met with in rear tenements, 245; effect of acclimation on, ib.; causes of, among the poor, 224; preventable causes of, 199; improper food, intemperance, 201; spread by paper money, clothing, public conveyances, etc., 202; patent medicines, 203; unwillingness of tenants to acknowledge the existence of, 249; always liable to terminate unfavorably with the intemperate, 311; a large amount of

preventable, 251; statistics of, in the Twenty-third District, 288; effects of stagnant water upon, 342; the carelessness of the Irish, and the over-carefulness of the Germans, 342.

Dispensaries, special services of, cxxxv; the New York, 81; the Eastern, 96; in the Thirteenth District, 158.

Drainage of the City, reports on, xcvi; quotations from Mr. Menzies's treatise on, xcvii; natural of the island how obstructed, xcviii; of the Third Inspection District, 21, 35; of the fourth, 44; of the Fifth, 66; of the Eighth, 92; of the Ninth, 97; of the Tenth, 110; of the Eleventh, 117; of the Twelfth, 127; of the Thirteenth, 143; of the Fifteenth, 171; of the Sixteenth, 187; of the Seventeenth, 196; of the Eighteenth, 207; of the Nineteenth, 223; of the Twentieth, 228; of the Twenty-first, 256; of the Twenty-second, 268; of the Twenty-fifth, 298; of the Twenty-sixth and Twenty-seventh, 326; of the Twenty-eighth, 336, 337; instances of defective, 43, 102, 188; importance of thorough, 92; influence of bad house-drainage on the health of the inhabitants, 102; local, absence of, or imperfect, 185; sickness caused by defective house-drainage, 188; surface, ib.; tubular drains of tile preferable to those of brick, 232; faulty waste-pipes, 243.

Dram-Shops, in the First Inspection District, 10; in the Second, 16; in the Third, 26; in the Fourth, 59; in the Fifth, 67, 71; in the Sixth, 81; in the Seventh, 86; in the Eighth, 96; in the Ninth, 106; in the Tenth, 112; in the Eleventh, 123; in the Twelfth, 137; in the Thirteenth, 152; in the Fourteenth, 167; in the Fifteenth, 173; in the Sixteenth, 191; in the Eighteenth, 213; in the Twentieth, 241; in the Twenty-first, 257; in the Twenty-second, 277; in the Twenty-fourth, 293; in the Twenty-fifth, 310; in the Twenty-sixth and Twenty-seventh, 330; in the Twenty-eighth, 341; in the Twenty-ninth, 346; influence of, on the sanitary condition of squares, 100, 123; character of, 10, 137, 214; evils resulting from, 81, 106, 137; prejudicial to the public health, 137, 186; by whom frequented, 10, 26; ratio of the number of families in the Eighteenth District, 213; numerous in the locality of tenant-houses, 106; thronged with multitudes of both sexes, 167, 245; evils of, among squatter-tenements, 293; dispensaries of poisons, 341.

Draper, Professor J. W., letter from, 312 *note;* report by, xcix.

Draper, Henry, M.D., a chemical analysis of well-water from the Twenty-third District, made by, 313 *note.*

Dutch Hill, location of, 282; employments of the inhabitants of, 286.

Dwelling improvements in English cities, lxxxiv, lxxxviii; Alderman Waterlow's described, lxxxvi; Rev. Dr. Muhlenberg's remarks on the necessity for, in New York, lxxxviii; recommendations for, lxxxix; needed in private houses, lxxxix, xc.

Dwellings, area of the city to be occupied by, cxxxii; private, in the First Inspection District, 6; in the Second, 15; in the Third, 25, 38; in the Fifth, 67, 70; in the Seventh, 86; in Eighth, 93; in the Ninth, 100; in the Tenth, 112; in the Eleventh, 121; in the Twelfth, 133; in the Thirteenth, 148; in the Fourteenth, 166; in the Fifteenth, 173; in the Sixteenth, 187; in the Seventeenth, 197; in the Eighteenth, 210; in the Twentieth, 241; in the Twenty-first, 257; in the Twenty-second, 276; in the Twenty-fourth, 291; in the Twenty-fifth, 306; in the Twenty-sixth and Twenty-seventh, 328; in the Twenty-eighth, 340; faulty ventilation of, 38, 210; why bad odors occasionally occur in, 133, 233, 307; sanitary condition of, compared with that of tenant-houses, 135; occasional want of sanitary care in regard to, 210; defective sewerage and plumbing of, 291, 328; blood-poisoning and death from defective drainage of, 307; several connected with the sewer by a single drain, 307; having no cellars, 329.

Dysentery in the First Inspection District, 12; on low, damp ground, 41; in damp and filthy basements, 55, 71; prevalence of, in the Fourth Inspection District, 63; in the Fifth, 72; in the Seventh District, 89; in the Tenth, 113; connected with imperfect sewerage, 119; with crowded and insalubrious quarters, 124; with filthy streets and gutters, 183; in the Sixteenth District, 193; on reclaimed ground, 199; in connection with filthy privies and damp cellars, 237; among the occupants of shanties in the Twenty-fifth District, 306; in the vicinity of stagnant water, 316.

Eliot Dr. E., Sanitary Inspector, 284; on the up-town nuisances, 283; on street-cleaning, etc., 284; on filthy places and gross abuses, 285; "Dutch Hill," 286; on poisonous gases and emanations in dwellings, 287; on the tenant-houses in the Twenty-third District, 288; the "Great Eastern" tenant-house described, ib.; remedial measures suggested by, 290.

Epidemics, attack low, reclaimed ground first, 23 extinguished by cleanliness and ventilation, 213; die out after a certain length of time, 213; may be arrested, 216; attack the immoral and degraded classes, 218; influenced by want of sanitary regulations, 249, 250.

Erysipelas in the Third Inspection District, 29; in the vicinity of stables, 62.

Exanthematous Fevers, partly preventable, liv.

Executive Committee, its report on the plan and progress of the Sanitary Survey, xxi; names of, xxxv.

Factories in the Third Inspection District, 27, 38; in the Fifth, 71; in the Sixth, 81; in the Twelfth, 138; in the Fourteenth, 167; in the Eighteenth, 215; in the Twenty-fourth, 294.

Families childless from high death-rate in tenant-houses, lxxviii.

Farrington, Dr. J. O., Sanitary Inspector, 345; remedial measures suggested by, 347; statistical recapitulation by, 348.

Fat-boiling, establishments for, in close proximity to large business thoroughfares, 86; emanations arising from, ib.; in the Twenty-first District, 262; effects of inhaling the odor from, 262.

Fever in the years 1863–'4, cv; in the Eleventh and Seventeenth Wards, cvi; its causes and control considered, cxxxvi; prevailing most extensively in moist localities, 23; in damp cellars and basements, 81; in the Sixth Inspection District, 82.

—— Bilious and Miasmatic, causes of, 240.

—— Continued, prevalent in the Twenty-second District, 279.

—— Intermittent, prevailing on reclaimed, low, and poorly-drained ground, 41; in the vicinity of stagnant water, 316, 337, 346, 347; statistics of, from the Manhattan Dispensary, 343.

—— Malarial, in the vicinity of stagnant water, 230, 342.

—— Remitting, almost universal among children in tenant-houses of the Third Inspection District, 29; on reclaimed ground, 41; in the vicinity of stagnant water, 337.

—— Typhoid, causes of, preventable, li.; in some portions of the Third District, 29; malignant type of, 41; in damp cellars, 71; in the Fifth Inspection District, 72; in the Seventh, 89; in the Tenth, 113; in tenant-houses of the Twelfth District, 139; in the Thirteenth, 162; in the Fourteenth, 169; in the Fifteenth, 179;

in the Eighteenth, 215; caused by the inhalation of sewer gases, 233; by human exhalations and cloacal effluvia, 240; in the Twentieth District, 248; produced by privy exhalations, 309; in the vicinity of stagnant water, 316; caused by the impure exhalations from filthy streets and gutters, 327; in One Hundred and Tenth Street, 344.

Fever, Typhus, special reports on, and forms for, xxxv; where found, xlviii; preventable by fresh air and cleanliness, li; in tenant-houses, l; how prevented, li; illustrations of its infectious nature, lvi, lvii; localizing causes, lviii; neglect of, by municipal authorities, lix; footprints of, 6, 31; prevalence of, in the First Inspection District, 9, 13; in the Second, 17; in the Third, 29, 41; in the Fourth, 63; in the Sixth, 82; in the Seventh, 89; in the Ninth, 102; in the Eleventh, 124; in the Thirteenth, 162; in the Fourteenth, 168; in the Fifteenth, 179; in the Seventeenth, 199; in the Eighteenth, 215; in the Twenty-first, 265; traceable to newly-arrived immigrants, 17, 42, 69, 82, 162, 169; to discharged soldiers, 169; arrested by free ventilation, 17, 163; its relation to the nature of the ground on which it occurs, 23, 41; as connected with the humidity of the atmosphere, 36; with neglected privies and cesspools, 36; with junk-shops and clothing-houses, 61; with tenant-houses, 63, 78, 211, 306; diminishes during summer months, 63; may be controlled, 83, 216, 319; originating in a crowded tenement, 102; inspires dread which interferes with the welfare of the patient, 168; endangers the life of the physician, 169; in proximity to slaughter-houses, 192; in connection with stables, 192; in rear tenements, 275, 280; spread of, in the Twenty-second Inspection District, 280, 281; cases of imported, 281, 306; spread of, due to overcrowding, ib.

Fever-Nests, definition of, xxi; inspection of, xxxiv; the probable number in the city, cvii; in the First Inspection District, 9; in the Third, 41; in the Sixth, 78, 84; in the Eighteenth, 216; in connection with stables, 81; description of a, in Monroe Street, 102; continued by the condition of certain tenant-houses, 216; locality of, in the Eighteenth District, 216; physicians and others contracting fever in, ib.; description of a noted, in the Eighteenth District, 217; number of cases occurring in a, 218; located on made ground, ib.; how to exterminate disease from, 219; advantages gained by sanitary measures applied to, 267; description of, in the Twenty-second District, 279, 280.

Field, Dr. H. M., Sanitary Inspector, 206; on primitive and present topography, 207; on streets and gutters, 208; on avenues of wealth, and streets of poverty, 209; on the faulty construction of tenant-houses, 211; on cellars and basements, 212; on epidemics of fever, 213; dram-shops and liquor stores, 214; trades and unhealthful occupations not causes of fever, 215; the spreading of infection may be arrested, 216; description of a noted fever-nest, by, 217; epidemics attack the immoral and degraded first, 218; on the social aspects of insalubrious quarters, 219; remedial measures suggested by, 221.

Fire Escapes, want of, 80, 315.

Food, articles used for injury of, xcv; chemical inquiry concerning, cii; quality of, used by the poor, 59, 60, 166; how sometimes obtained for sailors' boarding-houses, 60; stale vegetables and fish, and unripe fruit, produce cholera morbus, diarrhœa, and dysentery, 201; unwholesome articles of, 311; their effects upon children, 312.

Fort Gansevoort, where situated, 116.

Fort Washington, 336.

Foulis, Dr., his sanitary work in Edinburgh, cxxx.

Furman, Dr. G., Sanitary Inspector, 195; on reclaimed ground, 196; on sewerage, ib.; domiciles, and people, 197; location and neglect of privies, 198; prevailing maladies and preventable diseases, 199; on the evil effects of watering the streets, 200; unventilated cellars and basements, ib.; brutal health-wardens and wretched mothers, 201; on faulty hygiene in public schools, 202; how are communicable diseases spread, ib.; on the indiscriminate use of patent nostrums, 203; remedial measures suggested by, ib.; description of a model tenant-house, 204; evils to be remedied, 205.

Gamgee, Prof. J. S., his reports on diseased animals and meats, xcv.

Garbage, nuisance of, cxxviii; disposal of a cause of insalubrity, 8, 37, 39, 68, 76, 95, 151, 183, 230, 269, 304, 308, 328, 331, 339, 340; effects of leaving in the street, 8, 95; in front of houses where cholera infantum was found, 183; non-removal, 185; improved receiving vessel for, 232.

Garbage-Box, a perpetual source of nuisance, 76, 124, 157, 230; not adapted to the wants of a cleanly people, 95; necessity for abolishing, 114; should be provided with covers and emptied daily, 137; a source of great evil where tenant-houses are most abundant, 185, 230; made of improper material, 189; in front of public schools, 151; decaying organic matter found in, 200; never completely emptied, 230, 274; seen in front of tenant-houses, 290; faulty construction of, 286; practically of little consequence, 308.

Gas, nuisance from manufactories of, xcv, 192; operatives subject to an affection of the eyes, 192.

Geology, of the Third Inspection District, 19; of the Sixth, 75; of the Tenth, 111; of the Thirteenth, 142; of the Seventeenth, 196; of the Twentieth, 227; of the Twenty-third, 283; of the Twenty-fifth, 298; of the Twenty-eighth, 336.

Gotham Court, description of, 49; statistics of, 52; health of the occupants of, 54.

Greenhow, Dr. S. Headlam, report on Diarrhœa Districts of England, cix.; on registration of disease, cxxiii.

Greenwich Village, how situated, 116.

Griscom, Dr. J. H., his treatise referred to, cxxxiii.

Groceries, how affect the public health, 40, 55, 71, 137, 277, 285.

Gutters, irregular grading of, 129, 143; unwholesome miasmata emanating from, 129; obstructions of, 143, 172; condition of, in front of tenant-houses, 305; wretched sanitary condition of, 183; diseases consequent thereon, ib.; receptacles of garbage, filth, etc., 269; in the Twenty-eighth District, 338.

Hadden, Dr. A., Sanitary Inspector, 325; on the natural water-courses of the Twenty-sixth and Twenty-seventh Districts, 326; old water-courses obstructed, 327; the evils of sewer gases, 328; on tenant houses, 329; evils and their remedies, 331; foul gutters and poisonous gases, 333; garbage-box and waste-pipe proposed by, 333; statistical recapitulation by, 334.

Hale, Chief Justice, on the causes of crime, 106.

Hammond, Dr. William H., his hygienic studies referred to, cxxxiii.

Halliday, Mr. S. B., his report on homes of the poor in the Sixth Ward, lxxvii.

Harriot, Dr. H., Sanitary Inspector, 18; old swamps and present drainage, 21; street elevations, 22; influence of topography on health, 23; tenant-houses, 25; on the influence of sta-

bles on the public health, 27; prevailing diseases of the Third District, 29; diseases prevalent in proportion to crowding, etc., ib.; an investigation needed, 30; footprints of typhus and small-pox, 31; statistical recapitulation by, 32.

HARRIS, Dr. ELISHA, treatise on ventilation by, 95; outlines of the progress of sanitary improvement by, 258.

HEALTH, its value, xxxviii; laws, committee on, xxxiii; standard of, how estimated, xli; necessity for its public protection, civ; a Board of, needed, cxxvii; the present organization inadequate, 140; measures for the promotion of, should be under the supervision of medical men, 141, 249.

HEALTH WARDENS, should have authority over insalubrious buildings, 114; example of the neglect of a, 201; office of, a sinecure, 248; occupation of, in the Twenty-third District, 290.

HOUGH, Dr. FRANKLIN B., his statistics and predictions, cxxi.

HOUSE-TO-HOUSE inspections, some results of stated, xlii.

HOUSE-DRAINAGE, its importance, xc.

HUNTER, Dr. WILLIAM C., Sanitary Inspector, 182; amount of preventable disease in proportion to filthy streets, 183; on the evils of obstructed sewerage, 184; on the massing of buildings, ib.; garbage and negligence, 185; on uncleanly and intemperate habits, 186; classification of buildings by, ib.; tenant-houses and statistics by, 187, on the evils of defective house-drainage, 188; water supply and domestic wants by, 189; on cellars and basements, 190; on dram-shops and soap-factories, 191; on typhus and ophthalmia in proximity to stables, 192; on filthy places and prevailing diseases, 193; on locality of disease, 193; remedial measures suggested by, 194.

HYGROMETRICAL OBSERVATIONS, during the sanitary survey, xcviii; made in the Third Inspection District, 36.

IMPROVEMENTS, made during the season in the First Inspection District, 12; in the Third, 43; in the Seventh, 89; in the Fourteenth, 170; in the Twentieth, 248; in the Twenty-first, 267; none made by the health authorities, 170, 247; in the Twenty-ninth District, 347.

INFANTS, sacrifice of, in tenant-houses, 10, 64; mortality of, in the Sixth Inspection District, 82; vitiated diet of, 96; diseases of, in the Fourteenth District, 168; congenital contaminations of, ib.; diseases of, in the vicinity of a tripe establishment, 310.

INFANTILE DISEASES AND MORTALITY, in the Fourth Inspection District, 64; in the Fourteenth, 168; in the Fifteenth, 180; fifty per cent. of, from preventable causes, 41; fearfully high in the Sixth District, 82; among the poor in the Twenty-fifth District, 199, 201; use of patent medicines; 203; the overcrowding of tenant-houses a fruitful source of, 241, 271; in the Twenty-fifth District, 303; due to stagnant water, 304, 317; to the condition of the domiciles, 306, 307; to the condition of privies, 309; to unwholesome articles of diet, 312; to habits of the parents, 315; cholera infantum, 321.

INFECTION, of fever, its spread from tenant-houses, cxxxiv.

INHABITANTS, character and employment of, in the First Inspection District, 5; of the Second, 15; of the Third, 24, 37; of the Fifth, 67, 70; of the Sixth, 77; of the Seventh, 85; of the Eighth, 91; of the Ninth, 100; of the Tenth, 111; of the Eleventh, 120; of the Twelfth, 132; of the Thirteenth, 147; of the Fourteenth, 166; of the Fifteenth, 181; of the Sixteenth, 186; of the Seventeenth, 197; of the Eighteenth, 209; of the Twentieth, 240; of the Twenty-second, 275; of the Twenty-third, 286; of the Twenty-fourth, 293; of the Twenty-fifth, 303; of the Twenty-sixth and Twenty-seventh, 328; of the Twenty-eighth, 340; of the Twenty-ninth, 346; the proportion of foreign to American birth of, 5; crowding of, 6; of tenant-houses need to be educated on sanitary subjects, 68, 113, 115; physical and social degradation of, in crowded tenements, 179; uncleanly and intemperate habits of, 186.

INSPECTION, sanitary, plan and commencement of, xxii.; Inspection Districts, boundaries of, etc., xxii.; should be unremitting, cxxvii.

INSTRUCTIONS, to Sanitary Inspectors, xxiv; in the laws of health needed, cxxxvii.

INTEMPERANCE, crime in consequence of, 137, 167, 214, 250; disease in proportion to the extent of, 196, 201; accidents in consequence of, 310; effects of, not confined to victims of the habit, 311.

JANES, Dr. E. H., Sanitary Inspector, 226; on the medical topography of the Twentieth District, 227; on the advantages of good natural drainage, 228; evidence of natural salubrity presented, 229; the garbage-box, 230; on the relations of pavements and sewerage to health, 231; evils of sewer gases and obstructed sewers, 233; a plan of sewerage described by, 234; why certain squares are insalubrious, 237; on the massing of tenements, 238; evils resulting therefrom, 240; difference between private dwellings and private houses by, 241; classification of buildings by, 242; on the number of cubic feet of air-space to an individual in tenant-houses, 242; on water supply and house-drainage, 243; on rear tenements, 244; habits and diseases in rear tenements, 245; on cellar population, 247; negligence of health-wardens, 248; epidemics and endemics in tenant-houses, 249; on epidemic and contagious influences upon insalubrious quarters, 250; on neglect of vaccination, 251; remedial measures suggested by, 252; poverty and crime as associated with disregard of hygienic laws, 254.

JARVIS, Dr., reports spread of small-pox to the country, lx.

JUNK-SHOPS, their connection with the spread of contagions, 61.

KEENEY, Dr. B. M., Sanitary Inspector, 33; on the effect of tides upon the sewers, 35; hygrometrical observations by, 36; on the causes of sickness and mortality, 37; moral condition of the inhabitants, 38; on tenant-houses, 38, 39; diseases in cellars and basements, 40; prevailing diseases, 41; on sanitary improvement, 42.

KENNEDY, Dr. J. T., Sanitary Inspector, 91; on the influence of the condition of the streets upon the public health, 92; influence of topographical conditions upon the public health, ib.; on the order and industry in the Tenth Ward, 93; on tenant-houses, 94; tenant-house packing, 95; summary of disease and mortality, 96.

LABORING CLASSES, sanitary wants and neglect of, lxxiv; Legislative Committee's report on their habitations, lxxv.

LANDLORDS, grasping disposition of, 219; have no right to refuse necessary repairs, or to withhold sanitary care, 220.

LAWS, compulsory, not waited for, cxli; will result from increased intelligence, cxl.

LENTE, Dr. FREDERICK D., reports of contagion of small-pox from New York, lx.

LIEBIG, Professor, practical suggestions by, cxxviii.

LIGHT, deficiency of, in commercial warehouses, 16; public school-houses built without proper

regard to, 28; excluded from cellars and basements, 40, 103, 152; absence of, in the halls of tenant-houses, 47, 68, 149; in rear dwellings, 49; in the apartments of tenant-houses, 102; in the dormitories, 21, 150; importance of, 203; a life-sustaining element, 244.
LISPENARD MEADOWS, original topography of, 21, 33; how filled in, 21, 34; map of, 20.
LITTLE, Dr. J. L., Sanitary Inspector, 255; on the natural water-courses and surface of the Twenty-first District, 256; on the sewerage and tenant-houses up-town 257; effects of impurity of the air, 258; on prevailing modes of constructing tenant-houses, 259; a table showing the number of cubic feet of air-space to an individual, 259; nuisances that produce disease, 261; on mortality as influenced by occupation, 262; on fat-boiling and gut-cleaning establishments, 262; on diseased cows and their milk, 263; the offal dock, ib.; slaughter-pens and fever, 265; on the prevailing diseases of the Twenty-first District, 265; on fever-nests, 267.
LIVERPOOL, progress and results of sanitary improvement in, cxvii.
LOCALIZING CAUSES OF DISEASE, numerous and excessive in New York, lxvii.
LODGING HOUSES, specimen of, in the First Inspection District, 6; in the Sixth, 77; in the Thirteenth, 163.
LOINES, Dr. J. P., his services as a public vaccinator, cxxxv.
LONDON, its metropolitan sanitary system, cxiv, cxv; death-rate in, how reduced, cxvi.
LORD, Captain B. G., services of, cxxvii; census by, 87; on cellar population, 247; estimate of cubic feet of air-space to an individual by, 260.
LYING-IN ASYLUM, surrounded by typhus, 89.
—— THE DUBLIN, good effects of ventilation in, 213.
MALARIA, its causes, how controlled, 1; in the Twelfth Ward, 343, 347.
MACCLESFIELD, ENG., results of sanitary works in, cxviii.
MANCHESTER, ENG., results of sanitary works in, cxvii.
MANSFIELD, Dr. J. R., Sanitary Inspector, 223; on sickness and its chief causes among the poor, 224.
MANURE HEAPS, as sources of disease, 201; in the Twenty-first Inspection District, 264; in the Twenty-third, 285; spreading of, a cause of fever, 295.
MARASMUS, in the First Inspection District, 12; in rear tenant-houses, 49; in "Gotham Court," 54; in the abodes of the poor, 64.
MARKETS, Washington, condition of, 10; Franklin, 16; Fulton, ib.; in the Third Inspection District, 38; in the Fourth, 59; in the Twelfth, 138; in the Eighteenth, 214.
MARSHES, in the Twenty-eighth District, 337.
MEASLES, in the First Inspection District, 12; in the Second, 17; in the Fifth, 72; in the Sixth, 82; in the Fifteenth, 179; in the Sixteenth, 193; exposure to, in crowded cars, 202; in the Twentieth District, 248; frequent in consequence of exposure in the public schools, 319.
MEDICAL CHARITIES, the physicians to, xxii.
METROPOLITAN POLICE, form of report to, concerning insalubrious quarters, etc., xxx; constant sickness-rate of its force, xliii.
MIDDLE CLASSES OF SOCIETY, how disappearing, lxxiii, lxxxi.
MILK, bad quality of, 60; of the nursing mother, 201; from swill-fed cows, 250, 263, 296, 312; from cows on Dutch Hill, 286.
MILLSPAUGH, Dr. J. L., Sanitary Inspector, 16; faulty condition of streets, 15; on the sanitary wants of commercial warehouses, 16; remedial measures suggested by, 17; statistical recapitulation by, 18.
MINETTA CREEK, description of, 127; the cause of wet and damp cellars in its old course, 128.
MONELL, Dr. J. A., Sanitary Inspector, 3; on the absence of sewerage, 5; example of crowding, 6; on tenant-houses, 7; an example of insalubrity, ib.; fever-nests, 9; remedial measures suggested by, 12.
MORTALITY, causes and rate of, xliv, xlvi; rates of, in Fifth and Fifteenth Wards, xlv; in Fourth and Sixth Wards, xlvi; of the entire city, xlvii; increase of, in the Sixth Inspection District, 82; infantile, ib.; in the Eighth District, 96; in the Ninth, 107; in the Twelfth, 140; in dispensary practice, 170; rate of among different classes, 262.
MOUNT PITT, 110.
MURRAY HILL, location of, 282; intermittent fever among the residents of, 284; crowded tenant-houses at the foot of, 288.
MUSSEY, Dr., on ventilation, 212.
NARCOTIC POISONS, often substituted for alcohol, 60.
NEWMAN, Dr. R., Sanitary Inspector, 142; streets and drainage of the Thirteenth District, 143; can the sewers be cleansed? 145; localities having no public sewers, 146; classification of buildings by, 148; on tenant-houses and their occupants, 149; description of nuisances, 151; massing of tenant-houses, 152; on cellar and basement population, ib.; tenant-house improvements, 153; dram-shops and their classification, 154; classification of slaughter-houses by, 155; improvements suggested by, 156; on schools, churches, and medical charities, 158; on nuisances, 159; on the prevailing diseases of the Thirteenth District, 162.
NEW ORLEANS, illustrating the utility of a sanitary police, cxiv.
NEW YORK, aggregation of population in, xxxix.
NIGHTINGALE, Miss, her remarkable sanitary reforms in the army, cxviii.
NOBLE, Dr. C. C., reports the spread of small-pox from New York, lx.
NOLAN, Dr. P., Sanitary Inspector, 85; on tenant-houses, 86; on fat-melting and hide-curing in crowded squares, 87; on diseases prevailing in the Seventh District, 89; remedial measures suggested by, ib.
NUISANCES, special, described, xcii, xcvi, cxxix; in the First Inspection District, 12; in the Third, 27; in the Ninth, 105; in the Tenth, 113; in the Thirteenth, 159; in the Sixteenth, 185, 193; in the Twenty-first, 261; in the Twenty-second, 274; in the Twenty-fourth, 294; in the Twenty-sixth and Twenty-seventh, 331.
OFFAL DOCK, in the Twenty-first Inspection District, 264.
OFFICERS OF HEALTH required in cities, cxxvi; their labors and success in London, cxiv.
OPHTHALMIA, in crowded tenements, 48, 82; among cellar population, 71; in the Sixth Inspection District, 82; due to vitiated atmosphere, 129; to filthy streets and gutters, 183; in connection with dram-shops, 186; with slaughter-houses, 192; with stables, 192.
OVERCROWDING, of the city, cxxxii; its results illustrated, cxxxiii; of tenant-houses, 7, 37, 39, 52, 68, 77, 95, 102, 112, 134, 177, 193; evils of, 38, 58, 64, 89, 113, 167, 224; mortality in connection with, 77; of human beings with domestic animals, 339, 341; of areas, 7, 56, 112, 135, 152, 184, 238; of rail cars, 141, 203, 341.
PARSONS, Dr. R. L., Sanitary Inspector, 268; on filthy streets, and how they are kept so, 269; on the causes which render squares insalubrious, 270; overcrowding kills children, 271; proposed method of improving ventilation by, 274; on domestic filth and its consequences, 273; rear tenant-houses and fever-nests, 275; on the general character of private dwellings, 276; filth, dram-shops, and slaughter-pens, 277;

the Bellevue Hospital, 278; fever and epidemics localized by, 279; how fever travels, 281.
PALMERSTON'S advice on sanitary works against cholera, liii.
PAVEMENT, the Russ, 4, 15, 128; the Belgian, 4, 15, 24, 43, 82, 98, 128, 143, 172, 183, 207, 229; objections to the cobble-stone, 4, 15, 24, 44, 118, 128, 197, 208, 224, 231; where too uneven for thorough drainage, 35, 128, 208; neglected condition of, 183.
PEABODY, Mr., his healthy dwellings for the poor, lxxxv.
PELHAM COURT, description of, 105.
PERCY, Dr. SAMUEL R., on the food of cities, 263.
PHILIPS, Mr. JOHN, statement in regard to sewers by, 213.
PHTHISIS, as developed in the abodes of the poor, 63, in the Tenth Inspection District, 113.
PIERS, in the First Inspection District, 12; in the Third, 28; in the Ninth, 105; intolerable stench from, 72; as a source of disease, 29; condition of the, adjoining Catharine Ferry, 105.
PLAYFAIR, Dr. LYON, his researches concerning rates of sickness and mortality, xli.
PNEUMONIA, prevalent in the vicinity of stables, 62; among the occupants of shanties, 306.
POLICE, METROPOLITAN, to execute sanitary regulations, cxxvii, cxxxix.
POLICY-SHOPS, patronage of, and evils resulting therefrom, 40, 58.
PONDS of stagnant water, a source of disease, 337, 346, 347.
POPULATION, aggregation of, in cities, xxxviii; crowding and rate of, in tenant-houses, lxx–lxxv; rate to the square mile in Fourth Ward, lxxi; in the city of New York, lxx; rate of its increase, cxxi; London, Liverpool, and Manchester, lxxi–lxxii.
PRINCE ALBERT, his plans of dwelling improvements, lxxxiv.
POVERTY no excuse for filth, 219.
PRIVIES, abuse of, 8, 16, 189; neglect of, xc; proximity of, to tenant-houses, 8, 39, 48, 80, 111, 135, 166, 184, 189, 261; insufficient for the accommodation of tenants, 39, 105, 189; neglect of cleaning, 39, 185, 261; overflowing of, 39, 80, 105, 145, 161, 219, 238; odor from, generating fevers, 56; location and kind of, in the Ninth District, 101; the contents of, overflowing the cellar, 151; effluvia from, diffused through the houses, 184; improper construction of, 185; occupants of rear houses the principal sufferers from, 189; located in cellars, 197; violation of law in the location, construction, and emptying of, 198; neglected, xci; should in all instances be connected with sewers, 274.
PRIVY VAULTS, etc., neglect and insalubrious effect of, xciv.
PROSTITUTION, in the First Inspection District, 10; in the Third, 26, 37, 40; in the Fifth, 67; in the Sixth, 81; in the Eighth, 96; in the Ninth, 106; under the guise of segar-selling, 138; in connection with tenant-houses, 26, 37; should be placed under legal and medical supervision, 138.
PULLING, Dr. E. R., Sanitary Inspector, 43; insalubrious quarters in the Fourth District, 44; classification of buildings by, 45; description of a tenant-house by, 47; "Gotham Court," 49; submarine dwellings, 55; overcrowding, the source of the greatest sanitary and social evils, 58; homes for the poor, 59; food and markets, 59; "'long-shore lobscouse," ib.; fountains of disease, 61; on influence of stables upon disease, 62; children die of fevers, 63; infantile disease and mortality, 64; "tenant-house rot," ib.; mobs and crime, 65.
PURDY, Dr. J. W., Sanitary Inspector, 70; on tenant-houses and their diseases, 71; statistical recapitulation of buildings, 72.
RAG-PICKERS' ROW, description of, 177.
RAILWAY-CARS, overcrowding of, a cause of disease, 141, 203; ventilation of, lxxxix.
REAR DWELLINGS, in the First Inspection District, 8; in the Fourth, 48; in the Fifth, 67; in the Sixth, 80; in the Ninth, 100; in the Tenth, 112; in the Eleventh, 122; in the Thirteenth, 151; in the Sixteenth, 186; in the Nineteenth, 224; in the Twentieth, 244; in the Twenty-first, 257; in the Twenty-second, 274; in the Twenty-third, 288; insalubrity of, 8, 49, 123; ventilation of, 122, 200; diseases common to, 200; effect of residence in, upon the nursing mother, 201; cellars of, 200, 241; disregard of personal cleanliness by the occupants of, 245.
RECLAIMED GROUND, in the First Inspection District, 3; in the Second, 14; in the Third, 21; in the Fourth, 43; in the Fifth, 70; in the Sixth, 76; in the Ninth, 97; in the Tenth, 110; in the Eleventh, 117; in the Thirteenth, 143; in the Fourteenth, 164; in the Fifteenth, 170; in the Seventeenth, 196; in the Eighteenth, 206; in the Nineteenth, 223; in the Twentieth, 228; in the Twenty-second, 270; in the Twenty-third, 283; in the Twenty-sixth and Twenty-seventh, 326, in the Twenty-eighth, 336; material used for, 14, 21, 97, 110, 165, 196, 223, 228.
RECOMMENDATIONS, of systematic medical inspection, lxi; of sanitary advice, lxii; to report and remove localizing causes of disease, lxvii; to establish sanitary government, lxvii; to reform tenant-houses, lxviii.
RECORDS of sanitary survey, system of, xxvi.
REGISTRAR-GENERAL'S reports, their purpose and utility, cxiv, cxxiv.
REID, Dr. D. B., illustrations of ventilation by, 94; cxxxiii.
REPORT, on pestilential diseases—schedule for, xxviii; of the Council of Hygiene, General, xxxvii.
REMEDIAL MEASURES, proposed, cxxv; suggested by Dr. Monell, 13; by Dr. Milspaugh, 17; by Dr. Warner, 69; by Dr. Thoms, 82; by Dr. Nolan, 89; by Dr. O. G. Smith, 105; by Dr. Acheson, 114; by Dr. Brown, 124; by Dr. Burrell, 140; by Dr. Newman, 156; by Dr. Derby, 170; by Dr. Ross, 181; by Dr. Hunter, 194; by Dr. Furman, 203; by Dr. Field, 220; by Dr. Mansfield, 225; by Dr. Janes, 252; by Dr. Little, 267; by Dr. Stewart, 297; by Dr. J. L. Smith, 323; by Drs. Brush and Hadden, 333; by Dr. Rodenstein, 344; by Dr. Farrington, 347.
RESPIRATION, requirements for its healthy performance, xc.
RHEUMATISM, contracted in damp cellars and basements, 3, 40, 71, 81, 199.
RIVINGTON PLACE, description of, 177.
RODENSTEIN, Dr. L. A., Sanitary Inspector, 335; on ponds and obstructed watercourses, 337; on the crowding of human beings and domestic animals, 339; on maladies and their causes, 341; statistics of intermittent fevers by, 343.
ROSS, Dr. J., Sanitary Inspector, 171; on the sanitary topography and formation, 172; on the evil effects of dirty streets, ib; effect of tides upon the sewers, 173; on dwellings, and the rate of crowding, ib.; tenant-houses, "dens of death," 174; a model needed, ib.; on pestilential quarters, 175; description of Rivington Place by, 177; on crowd-poisoning and typhus, 179; typhus localized, 180; the remedy suggested by, 181.
SANITARY COMMISSION, the U. S. Army—its purposes and results, cxviii; its statistical bureau, cxxiv.

Sanitary Inquiry, plan and leading points of, xxiv; subjects of, xxvii; system of, xxvi; Inspection Districts and boundaries, xxii; Inspectors, instruction to, xxiv; necessities—prospective of New York, cxix; works, practical character of, civ; described, cv; diseases that show the necessity of, cv, cxii; necessities of populous cities, xxxviii; examples of, cxiii.

Sanitary Science, necessity for its practical applications in cities, xxxix; its value and applications, cliii.

Scarlatina, proximity of, to stables, 27; prevailing in tenant-houses in proportion to crowding, uncleanliness, etc., 29; in the Fifth Inspection District, 72; in the Tenth, 113; in tenant-houses of the Twelfth District, 139; in the Fifteenth District, 179; in the Sixteenth, 183; in the Twentieth, 237, 248; frequent in consequence of exposure in the public schools, 319.

Schools, in the First Inspection District, 11; in the Second, 17; in the Third, 28, 41; in the Fifth, 72; in the Sixth, 81; in the Seventh, 89; in the Ninth, 96; in the Eleventh, 125; in the Twelfth, 133; in the Fifteenth, 173; in the Sixteenth, 187, 192; in the Seventeenth, 199, 202; in the Eighteenth, 222; in the Nineteenth, 225; in the Twentieth, 241; in the Twenty-second, 276; badly arranged for ventilation and light, 17, 28, 81, 139, 202; proximity of, to fever-nests, 41, 82; to fat-boiling establishments, 87; faulty hygiene in, 202; adjoining a row of stables, 225.

Seaman, Dr. Valentine, his first vaccination, cx.

Serrell, James E., improvements by, 233, 257; plan for saving the sewage and relieving the slips, 234.

Sewage, evils of emptying into the slips, 23; effects of the putrefactive decomposition of, 199; a plan proposed for saving the, 234.

Sewerage, of the First Inspection District, 4; of the Second, 15; of the Third, 21, 35; of the Fourth, 43; of the Fifth, 66, 70; of the Sixth, 77; of the Seventh, 84; of the Eighth, 92; of the Ninth, 99; of the Tenth, 111; of the Eleventh, 118; of the Twelfth, 130; of the Thirteenth, 144, 146; of the Fourteenth, 165; of the Fifteenth, 173; of the Sixteenth, 183; of the Seventeenth, 196; of the Nineteenth, 223; of the Twentieth, 231; of the Twenty-first, 257; of the Twenty-second, 279; of the Twenty-third, 287; of the Twenty-fourth, 291; of the Twenty-fifth, 300; example of faulty, 22, 35, 119; obstructions to, 77, 119, 184; diseases influenced by imperfect, 77, 99, 119, 304; how affected by the tide, 3, 22, 36, 146, 173; general effect of, upon the public health, 111; imperfect, in the Eleventh District, 119; in the Thirteenth, 145; health statistics in connection with, 131; necessity for an improved system of, 144; the original plan of, for this city, defective, 145; objections to the present system of, 233; a plan suggested, 234; advantages and economy of the "dirt catchers," 235; insufficient in the Twenty-eighth District, 339; of the Twenty-ninth, 346.

Sewers, flushing and cleansing of, xcvii; buildings imperfectly, or not connected with, xcvii, 5, 15; the proper depth of, 22; emanations from, injurious to health, 130, 165; experiments on the lower animals, 131; escape of gases from, 231; causes, 223; inconvenience of cleaning the, 233; Mr. Serrell's plan for constructing, 234.

Sewer Gases, evils of inhaling, 233, 328; how to prevent or destroy, 205.

Shanties, as affecting the public health, 99; in the Twenty-fourth Inspection District, 292; occupants of, 293; demoralizing influence of, 293, 294; the typical shanty described, 300; wooden tenements distinguished from, 301; population of, and their occupation, 303; mortality among infants, 303; severe cases of diphtheria in, 319; the floors of, should be elevated, 323; in the Twenty-eighth District, 339; in the Twenty-ninth, 346.

Sinks, with no sewer connection, 102.

Slaughter-houses, insalubrious influence of, xciv; in the city injurious, cxxviii; in the Fifth Inspection District, 71; in the Seventh, 86; in the Eleventh, 123; in the Twelfth, 138; in the Thirteenth, 155; in the Fourteenth, 168; in the Fifteenth, 175; in the Sixteenth, 191; in the Nineteenth, 225; in the Twenty-first, 261; in the Twenty-second, 277; in the Twenty-fourth, 294; in the Twenty-fifth, 310; in the Twenty-eighth, 341; injurious to the public health, 86, 294; importance of the removal of, to the outskirts of the city, 87; moral influence of, 168, 294; filthy condition of, 175; cholera infantum in the vicinity of, 294.

Sickness-rate, explained, xli; its ratio to the death-rate stated and illustrated, xli, xlii; probable constant sickness-rate in New York, xliii; of Metropolitan Police force stated, xliii; that of New York corresponds with that of British cities, xliii.

Simon, Dr. J., special hygienic inquiries by, cxxxv; his recommendations, cxxxviii.

Small-pox, fields of, inspected, etc., xxxiv; plan of inspections, and report of, xxxiv; epidemic of, in winter of 1865, liv; the many foci of in New York, lv; its prevalence in particular districts, lv, cvii; total mortality from, cxi; its prevalence in connection with typhus, lvi; its complete arrest by vaccination, cx; where prevalent, 29, 63, 68, 89, 96, 106, 180, 319; spread of, through the medium of junk-shops and clothing, 61; prevalence of, in tenant-houses, 63, 139; traceable to newly-arrived immigrants, 69; preventable nature of, 83; progress of, arrested by vaccination, 344.

Smith, Dr. J. L., Sanitary Inspector, 298; on the streets of the Twenty-fifth District, and their condition, 299; description of a shanty by, 300; on the classes and character of the population in the Twenty-fifth District, 303; on preventable causes of disease and death, 303; neglect of local drainage, and faulty sewerage, 305; diseases in wooden tenements, 306; faulty drains and poisonous exhalations, 307; on the disposition of garbage, 308; Levitical laws of personal hygiene needed, 309; on summer-complaint of infants in the vicinity of fat-boiling establishments, etc., 310; fearful results of inebriety among the poor, 311; on the effects of using unwholesome articles of diet, 312; liquid poisons drank for want of Croton, 313; midwifery among the poor, 314; bad habits and sickly places, 315; sickness record of a single square, 318; the most fatal diseases preventable, 319; cholera in the vicinity of hog-styes and stables, 320; on the havoc of cholera infantum, 321; on the causes of cholera infantum, 322; remedial measures suggested by, 323.

Smith, Prof. Joseph M., report by, cxxxii, cxxxiii; "Idio-miasm," 166.

Smith, Dr. O. G., Sanitary Inspector, 97; on the condition of the streets in the Ninth District, 98; defective system of sewerage detrimental to public health, 99; causes of insalubrity, 99; classification of buildings, 100; description of the tenant-houses by, 101; their influence on the public health illustrated by, 102; description of a fever-nest in Monroe street by, 103; the Pelham street rookeries, 105; other causes of insalubrity, 106; diseases and vital statistics

of Seventh Ward, 107; the prevailing diseases localized by overcrowding and filth, 109.
SNOW, Dr. E. M., reports spread of small-pox from New York to Providence, lxi; his remarks on, cxiii.
SOAP FACTORIES, unhealthful influence of, 191.
SOIL, its relations to public hygiene, ciii; where favorable to drainage and public health, 14, 111, 128, 228; objectionable, 223.
SPOTTED FEVER, in connection with crowded apartments, 37.
SPRAGUE, Dr. JENKS S., his account of small-pox contagion from city of New York, lx.
SPECTRUM ANALYSIS, hygienic applications of, ci.
SQUARES of the First Inspection District, 5; of the Second, 15; of the Third, 24, 36; of the Fifth, 67; of the Sixth, 77; of the Seventh, 85; of the Eighth, 93; of the Ninth, 99; of the Tenth, 111; of the Eleventh, 120; of the Twelfth, 131; of the Thirteenth, 147; of the Fourteenth, 166; of the Fifteenth, 173; of the Sixteenth, 184; of the Eighteenth, 209; of the Twentieth, 237; of the Twenty-second, 270; of the Twenty-fourth, 291; of the Twenty-sixth and Twenty-seventh, 228; of the Twenty-eighth, 339; of the Twenty-ninth, 346; on reclaimed ground, 15; causes of the insalubrity of, 85, 99, 111, 131, 173, 184, 237, 269, 270, 328; two contrasted, 100; influence of liquor stores and dram-shops on the sanitary condition of, 120; example of, in a mixed sanitary condition, 131, 237; rate of crowding, 173, 184.
STABLES, in the First Inspection District, 11; in the Third, 27, 40; in the Fourth, 61; in the Fifth, 71; in the Sixth, 81; in the Seventh, 87; in the Twelfth, 138; in the Thirteenth, 116; in the Fifteenth, 174; in the Sixteenth, 192; in the Nineteenth, 225; sanitary care of, recommended, cxxix; diphtheria in connection with, 27, 225; as sources of insalubrity, 11, 27, 41, 61, 81, 89; influence of, upon disease, 62; evils of confining horses in subterranean, 138; effects of overcrowding, upon horses, 174; insalubrious effects of, on rear buildings, 192; ophthalmia and typhus in connection with, 192.
STATISTICS, of the First Inspection District, 13; of the Second, 18; of the Third, 32, 42; of the Fourth, 45, 46, 47, 55, 63; of the Fifth, 67, 69, 72; of the Sixth, 71, 78; of the Ninth, 100, 104, 107, 108; of the Tenth, 112; of the Eleventh, 125; of the Twelfth, 133–135; of the Thirteenth, 148, 150, 163; of the Fourteenth, 169; of the Fifteenth, 180; of the Sixteenth, 186, 191; of the Eighteenth, 222; of the Twentieth, 241, 242, 247; of the Twenty-first, 259; of crowded tenant-houses in the Twenty-third District, 288; of the Twenty-fifth, 302, 318, 321; of the Twenty-sixth and Twenty-seventh, 334; of the Twenty-eighth, 343; of the Twenty-ninth, 348; of disease required, cxxvi; vital, of New York City and suburbs, cxxi; practical uses of, cxxiii, cxxxix.
STEWART, Dr. R., Sanitary Inspector, 291; on the dwellings of the Twenty-fourth District, 292; on squatter sovereignty, immorality, and insalubrity, 293; slaughter-houses and their moral effects upon children, 294; on typhoid fever and places that produce it, 295; on swill-milk, 296; remedial measures suggested by, 297.
STILL-BIRTHS, proportion of, in the Sixth Ward, 82; causes of, 313; uneducated midwives, 314; impatient physicians, 314.
STORES, in the First Inspection District, 10; in the Second, 15; in the Third, 26, 38; in the Fourth, 45; in the Fifth, 71; in the Sixth, 81; in the Seventh, 86; in the Ninth, 105; in the Tenth, 112; in the Twelfth, 138; in the Thirteenth, 154; in the Fourteenth, 167; in the Sixteenth, 186; in the Eighteenth, 214; in the Twentieth, 241; in the Twenty-second, 276; in the Twenty-fourth, 294; how they affect the public health, 40, 71.
STREETS, of the First Inspection District, 4; of the Second, 15; of the Third, 23, 34; of the Fourth, 43; of the Fifth, 67, 70; of the Sixth, 76; of the Seventh, 85; of the Eighth, 92; of the Ninth, 98; of the Tenth, 111; of the Eleventh, 117; of the Twelfth, 128; of the Thirteenth, 143; of the Fourteenth, 165; of the Fifteenth, 172; of the Sixteenth, 182; of the Seventeenth, 197; of the Eighteenth, 207; of the Twentieth, 229; of the Twenty-first, 256; of the Twenty-second, 269; of the Twenty-fourth, 291; of the Twenty-fifth, 298; of the Twenty-sixth and Twenty-seventh, 327; of the Twenty-eighth, 337, 338; of the Twenty-ninth, 345; the cleaning of, cxxix; elevations of, 22, 143, 182, 195, 229; filthy condition of, 5, 24, 76, 99, 111, 118, 147, 339; insufficient capacity of, 15, 34; public health affected by the condition of, 92, 99, 111, 118, 172, 339; pernicious effects of watering the, 92, 200, 231; imperfect grading of, 35, 128; dirt of, how composed, 129, 172; influence of moisture and the sun's rays on the dirt of the, 129; a hot-bed for the production of noxious vegetable miasmata, 130; importance of sweeping the, ib.; depositories for garbage, and evils resulting therefrom, 208; never thoroughly cleaned except by private enterprise, 284.
STUYVESANT FARM, 142.
SWILL-MILK ESTABLISHMENTS, 263, 296.
SWINE, pens for receiving, 296; the raising of, a source of insalubrity in the Twenty-fifth Inspection District, 309.
TENANT-HOUSES, sanitary wants of, lxviii; total number of, in the city, lxix; aggregation and abuse of, in the Fourth Ward, lxxi; rate of crowding in, lxx, lxxii; number and character of new ones needed, cxxx; duties of the owners of, cxxx; system of, its abuses and perils, lxxix, lxxxiii; improved, lxxxiv; the number unfit for dwellings, cxxxiv; in the First Inspection District, 7; in the Second, 15; in the Third, 25, 38; in the Fourth, 44; in the Fifth, 67, 71; in the Sixth, 77; in the Eighth, 94; in the Ninth, 101; in the Tenth, 112; in Eleventh, 121; in the Twelfth, 134; in the Thirteenth, 149; in the Fourteenth, 166; in the Fifteenth, 174; in the Sixteenth, 187; in the Seventeenth, 199; in the Eighteenth, 211; in the Nineteenth, 224; in the Twentieth, 238; in the Twenty-first, 257; in the Twenty-third, 288; in the Twenty-fourth, 292; in the Twenty fifth, 300; in the Twenty-sixth and Twenty-seventh, 329; in the Twenty-eighth, 341; in the Twenty-ninth, 346; modern construction of, regardless of sanitary laws, 7, 112; size of apartments in, 7, 39, 47, 68, 86, 121, 149; description of improved tenant-houses, 122, 153, 204, 260; differ in the character of their population, 123; massing of, 7, 56, 112, 135, 152, 184, 238; where originally private dwellings, 7, 38, 45, 101, 121; overcrowding of, 7, 37, 39, 52, 68, 77, 95, 102, 112, 134, 177, 193; evils of overcrowding, 38, 58, 64, 89, 113, 167, 224; mortality in connection with overcrowding, 77 main object of the proprietors of, 68; ventilation of, 7, 25, 47, 68, 78, 80, 112, 151, 211; means of escape from, in time of fire, 80, 134, 190; sunlight excluded from, 8, 40, 68, 200, 221; disposal of garbage and house-slops from, 8, 39, 68, 80, 95, 112, 151, 183, 197; examples of insalubrity in, 8, 39, 109; never thoroughly cleaned, 40, 48, 67; flooding of, during heavy rains, 8; effects exhibited upon the inmates of, 9, 48; the tenant a slave to his landlord, 58; little hopes from temperance reform among

occupants of, 222; evils of imperfect house-drainage of, 151; indifference of the inmates of, to contagious diseases, 139; investigation needed, 30; the effects of a residence in, upon children, 221; defective drainage of, 39, 43, 80, 112, 197; classification of, in the Fourth District, 46; description of, in the Fourth District, 47; personal habits of the inmates of, 67; population of, in the Sixth District, 80; need of reform in the construction of, 114, 153; a gigantic system of evils, 222; "The Great Eastern," 288; want of proper supervision, 290; wooden, 300; condition of, in the Twenty-fifth Inspection District, 306; consequence of the ill usage of, 187; filthy condition of bedding, clothing, carpets, etc., in, detrimental to health, 201; condition of streets in front of, 230.

THOMS, Dr. W. F., Sanitary Inspector, 73; statistics of district, ib.; statistics of disease and mortality, 74; medical topography by, 75; the inhabitants of the Sixth District and their homes, 77; a Sixth Ward fever-nest, 78; prostitution in the Sixth Ward, 81; prevailing diseases, 82; popular education, 83; epidemics and their local causes, 84.

TIDES, effects of, on cellars and basements, 3, 22, 35, 283; a remedy suggested, 36; ground overflowed by, 337.

TOPOGRAPHICAL draughtsman in the sanitary survey, lxvii.

TOPOGRAPHY of the First Inspection District, 3; of the Second, 14; of the Third, 19; of the Fourth, 42; of the Fifth, 66, 77; of the Sixth, 75; of the Seventh, 85; of the Eighth, 91; of the Ninth, 97; of the Tenth, 110; of the Eleventh, 117; of the Twelfth, 127; of the Thirteenth, 142; of the Fourteenth, 165; of the Fifteenth, 171; of the Sixteenth, 182; of the Seventeenth, 195; of the Eighteenth, 206; of the Nineteenth, 223; of the Twentieth, 226; of the Twenty-first, 255; of the Twenty second, 268; of the Twenty-third, 282; of the Twenty-fifth, 298; of the Twenty-sixth and Twenty-seventh, 325; of the Twenty-eighth, 335; of the Twenty-ninth, 344; influence of, on the public health, 3, 23, 34, 92, 98, 143, 171, 182, 228; on drainage, 92; healthful influence of, counteracted by atmospheric contaminations, 283.

TRADES, sanitary wants of, cxxvi.

TYPHOID FEVER. See Fever.

TYPHUS FEVER. See Fever.

URINALS, public, necessary in large cities, 141, cxxix.

VACANT LOTS in the Fourth Inspection District, 59; in the Ninth, 105; in the Twelfth, 139; in the Sixteenth, 192; in the Nineteenth, 224; in the Twentieth, 246; places for repositories for ashes, garbage, etc., 192; open privies in, ib.; dumping-grounds for manure, 193; "Bummers' Retreat," 246.

VACCINATION, Jenner's discovery, liv; State and municipal laws for, needed, lv; when first performed in New York, cx; history of, in Massachusetts, cxi; why defective, cxxxv; conditions of protection by, cxxxvi; neglect of, 52, 106, 251, 319; a duty we owe to the surrounding country, 251; the progress of small-pox arrested by, 344.

VAN COURTLANDT FARM, 142.

VENTILATION, importance of, in dwellings and school-rooms, xc; how obstructed in tenant-house construction, xci; compulsory, recommended, cxxix; special, for tenant-houses cxxx; of crowded dwellings, cxxxiv; of tenant-houses, 7, 25, 47, 68, 71, 113, 134, 167, 190, 211, 224, 241, 257, 329; bad effects of the want of in commercial warehouses, 16; influence of, in arresting the spread of typhus, 17; houses vary as to their facilities for, 29; deficiency of, in private dwellings, 38, 133; of "Gotham Court," 52; of rear dwellings, 49, 78, 112, 152, 244, 245; of churches, 81; of public school-houses, 28, 81, 87, 202; a law needed to regulate the construction of buildings with regard to, 83; in old-fashioned private residences, 94, 112; Dr. Ried on, 94; Dr. Harris on, 95; of halls, 101, 114, 190; of dormitories, 103, 121, 148, 151, 180, 190, 242, 260, 329; effects of a want of, on pestilential disease, 109, 200, 280, 281; want of, a cause of insalubrity, 113, 257, 271, 329; example of a well-ventilated tenant-house, 122; of stables, 138; the erection of two many rear buildings an obstruction to, 151, 153; examples of good, in a tenant-house, 204, 260; beneficial effects of, in fevers, 211; defective in basements and cellars, 212, 273; the power of, to extinguish epidemics, 212; no right to build houses without regard to, 220; a want of, demoralizing, 221, 254; importance of, 242, 258; of factories, 246; power of, to neutralize contagious and infectious influences, 250; a suggestion for the impromont of, 272.

VERMIN, in brothels, 40; in crowded tenements, 52.

VIELE, General E. L., on the evils of imperfect drainage, 206; his report on civic cleanliness, xcviii.

VITAL STATISTICS, practical uses of, cxix; those of New York studied and tabulated, cxxi; should include statistics of disease and of health, cxxiii.

WARNER, Dr. E. B., Sanitary Inspector, 66; on topography and sewerage, ib.; inhabitants of the Fifth District, 67; on tenant-houses, 68; on prevailing diseases, ib.; remedial measures suggested by, 69; statistical recapitulation by, ib.

WASTE-PIPES, obstructions of, 146, 188, 197, 238; escape of sewer gases through, 232; escape of offensive vapor through, 243; should be thoroughly trapped, 252, 273; improved plan of, 332.

WATER, insufficient supply of, to tenant-houses, 112, 177; should be distributed to the apartments of each family, 189; Croton, better supply needed in certain districts, cix.

WATER-CLOSETS, should be substituted for sinks, etc., xcii; often obstructed, 39; filthy condition of, in the Sixth Inspection District, 80.

WATER-COURSES of the Third Inspection District, 21, 34; of the Sixth, 75; of the Twelfth, 127; of the Thirteenth, 143; of the Fifteenth, 171; of the Seventeenth, 196; of the Eighteenth, 207, 218; of the Nineteenth, 223; of the Twentieth, 228; of the Twenty-first, 256; of the Twenty-second, 268; of the Twenty-third, 283; of the Twenty-fourth, 298, 299; of the Twenty-sixth and Twenty-seventh, 326; of the Twenty-eighth, 336; of the Twenty-ninth, 345; obstructions of, a source of malarial fevers, 340.

WATSON, Dr., on the effects of fresh air in fevers, 213.

ZYMOTIC DISEASES, how affected by sanitary works, cxviii; how influenced by stables, 62.

WELLCOME LIBRARY INSTITUTE

