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Contributors

Taylor, Albert.
Royal College of Physicians of Edinburgh

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THE

SANITARY INSPECTOR'S HANDBOOK

THE

SANITARY INSPECTOR'S HANDBOOK

BY

ALBERT TAYLOR

ASSOCIATE SANITARY INSTITUTE; HOLDER OF THE INSPECTOR OF NUISANCES CERTIFICATE OF THE SANITARY INSTITUTE; CHIEF SANITARY INSPECTOR TO THE VESTRY OF ST. GEORGE, HANOVER SQUARE, LONDON; FORMERLY CHIEF INSPECTOR OF NUISANCES, WIGAN; AND SANITARY INSPECTOR, WALLASEY.

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WITH ILLUSTRATIONS

LONDON
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TO

PROFESSOR WILLIAM HENRY CORFIELD,

M.A., M.D., F.R.C.P., Hon. A.R.I.B.A.

TO WHOSE SUGGESTIVE GENIUS

ENLIGHTENED ZEAL AND UNTIRING ENERGY THIS COUNTRY

IS GREATLY INDEBTED FOR THE INTEREST WHICH HE HAS TAKEN IN

EDUCATING THE PUBLIC AND ITS EXECUTIVE SANITARY

OFFICERS IN THE TRUE PRINCIPLES OF SANITARY SCIENCE,

THESE PAGES ARE MOST RESPECTFULLY INSCRIBED

BY THE

AUTHOR.

PREFACE.

THE following pages have been compiled with the desire of furnishing to the Sanitary Inspector, and those seeking to qualify for such an appointment, a useful *vade mecum* upon the subjects pertaining to the office.

The book aims at supplying practical information on the various matters which come daily under the notice of the Sanitary Inspector, and not at being an exhaustive work of scientific reference.

It is hoped that the book may also be found useful to others who take an interest in sanitary subjects.

To Baldwin Latham, Esq., C.E. London; Dr. F. Vacher, Birkenhead, and A. Smith, Esq., B.A., LL.B., Town Clerk, Wigan, my best thanks are due for the privilege of embodying some information from their publications, and also to Dr. W. H. Corfield and Dr. Louis C. Parkes for permission to make use of blocks from their works.

The Extracts from the Acts of Parliament, and the quotations from the Regulations as to Sanitary Inspectors of the Local Government Board, are inserted by permission of the Controller of Her Majesty's Stationery Office.

A. T.

7 Commercial Road,
Buckingham Palace Road, S.W.
April, 1893.

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THE

SANITARY INSPECTOR'S HANDBOOK.

INTRODUCTION.

After ages of apathy, the people of this country are willing to recognise, with the advance of sanitary science, the fact, that the mortality amongst us is still excessive and should be further diminished. This conviction is no doubt a pledge for better things; for, if we would lessen disease and mortality, we must remove or lessen their causes, and to do this we must inquire into them and devise suitable remedies, which duty falls to the lot of Sanitary Inspectors and their superior officer the Medical Officer of Health.

It has become quite the fashion to speak of the origin of most infectious diseases as due to preventable causes, under these circumstances it may be presumed that we have passed the period of mere theory and speculation.

As the result of this belief great efforts are being made throughout the country to remove such insanitary conditions as may affect the community, such as defective drainage, accumulations of offensive matter, overcrowded and ill-ventilated dwelling rooms and workshops, offensive trades, and to provide a supply of pure air, water, and food, all of which tend to prevent epidemic diseases, and generally to improve the health of individuals.

Legislation has done wonders in this direction by providing for the appointment of Medical Officers of Health and Sanitary Inspectors in every town and village in the United Kingdom, whose duty it is to enforce the provisions of the Public Health Acts for the Abatement of Nuisances, and to prevent the sale of adulterated and unsound food.

This work is intended as a practical book of experience upon subjects relative to the duties to be performed by these officers, and as a textbook for students preparing for the examinations of the Sanitary Institute.

With the subjects selected, it matters, perhaps, little as to the order in which they are treated, but I have humbly endeavoured to compile such information for the guidance of the reader as may be of special interest, having proper regard to the duties which devolve upon Sanitary Inspectors.

THE INSPECTOR OF NUISANCES OR SANITARY INSPECTOR.

The office of inspector of nuisances was definitely legalised by the Public Health Act, 1848, section 37. The Nuisances Removal Act, 1855, section 9, adopted the more appropriate designation of "Sanitary Inspector," and yet we find the original term, Inspector of Nuisances, retained in section 133 of the Metropolis Local Management Act passed the same year.

The Public Health Act, 1875, and the Public Health

(London) Act, 1891, are the two principal Acts governing matters relating to Public Health in England and Wales. Both these Acts have made provisions for the appointment of inspectors, the former adopting the title of Inspector of Nuisances, while the latter uses the term Sanitary Inspector.

The clauses relating to the appointment of such officers are as follows :—

"Every urban authority shall from time to time appoint fit and proper persons to be medical officer of health, surveyor, inspector of nuisances, clerk, and treasurer: Provided that if any such authority is empowered by any other Act in force within their district to appoint any such officer, this enactment shall be deemed to be satisfied by the employment under this Act of the officer so appointed, with such additional remuneration as they think fit and no second appointment shall be made under this Act. Every urban authority shall also appoint or employ such assistants, collectors, and other officers and servants as may be necessary and proper for the efficient execution of this Act, and may make regulations with respect to the duties and conduct of the officers and servants so appointed or employed." (38 & 39 Vic., C. 55, S. 189).

It will be observed that an urban authority has power only to appoint "one" inspector, while a rural authority in the following section is empowered to make as many such appointments as may be thought proper :—

"Every rural authority shall from time to time appoint fit and proper persons to be medical officer or officers of health, and inspector or *inspectors of nuisances ;* they shall also appoint such assistants and other officers and servants as may be necessary and proper for the efficient execution of this Act." (38 & 39 Vic., C. 55, S. 190).

The sanitary authorities in the Metropolis are required to appoint a sufficient number of sanitary inspectors, otherwise they may be ordered by the Local

Government Board to do so, as directed in the following clause:—

"Every sanitary authority shall appoint an adequate number of fit and proper persons as '*sanitary inspectors*,' and may distribute among them the duties to be performed by sanitary inspectors, and every such inspector shall be a person qualified and competent by his knowledge and experience to perform the duties of his office.

"Where the Local Government Board, on a representation from the county council, and after local inquiry, are satisfied that any sanitary authority have '*failed to appoint a sufficient number of sanitary inspectors*,' the Board may order the authority to appoint such number of additional sanitary inspectors and to allow them such remuneration as the order directs, and the sanitary authority shall comply with the order." (54 & 55 Vic., C. 76, S. 107).

In case of officers any portion of whose salary is paid out of the Exchequer Contribution Account they are appointed subject to the powers of the Local Government Board. Any local authority preferring themselves to defray the whole expenses of their sanitary staff, may, subject to the provisions of the Public Health Act, 1875, make their own regulations as to the appointment, tenure of office and duties of such officers. All sanitary inspectors appointed in the Metropolis after the 1st January, 1892, are made subject to the Sanitary Officers (London) Order, 1891; but if the sanitary authorities elect to name their officers "assistant" sanitary inspectors, having one (chief) sanitary inspector, the "order" does not apply, and the sanitary authority thereby retains sole control of such officials.

Sanitary inspectors, especially in rural districts are frequently appointed for short periods of one, two, three or five years, but the principle of appointing persons to offices of such responsibility upon short terms acts most unsatisfactorily towards the inspector and the public whom he is expected to serve; for should the inspector

perform his duties without fear or favour he may find himself ousted from office directly the time arrives for his re-appointment.

Hence the thought of what may happen should he press for the abatement of a nuisance in which one of his masters is interested, can scarcely fail to affect the action of an inspector so placed.

It is competent by 38 & 39 Vic., C. 55, Sect. 192, for the sanitary inspector to act in the dual capacity of "surveyor and inspector to a local authority." This may be a satisfactory arrangement in a district having a small population and a limited area, but as the population and the consequent responsibilities increase it will be obvious, that to carry out the duties with satisfaction the appointments should be separated.

Nothing could be more disastrous to the efficiency of the work of a sanitary department, than to have the surveyor of a large urban district nominally acting as its chief sanitary inspector as this would often lead to unpleasantness between the two officials, owing to the fact that a great proportion of the inspector's work arises out of defective drainage, due frequently to the want of proper supervision of the drains when first laid, so that the omissions of the surveyor becomes the commissions of the inspector.

The following clauses apply both to rural and urban inspectors:—

"Officers or servants appointed or employed under this Act by the local authority shall not in anywise be concerned or interested in any bargain or contract made with such authority for any of the purposes of this Act.

"If any such officer or servant is so concerned or interested, or, under colour of his office or employment, exacts or accepts any fee or reward whatsoever other than his proper salary, wages and allowances, he shall be incapable of afterwards holding or continuing in

any office or employment under this Act, and shall forfeit and pay the sum of fifty pounds, which may be recovered by any person, with full costs of suit, by action of debt." (38 & 39 Vic., C. 55, S. 193).

"Before any officer or servant of a local authority enters on any office or employment under this Act, by reason whereof he will or may be intrusted with the custody or control of money, the local authority by whom he is appointed shall take from him sufficient security for the faithful execution of such office or employment, and for duly accounting for all moneys which may be intrusted to him by reason thereof." (38 & 39 Vic., C. 55, S. 194).

"Every person who shall by himself or by or in conjunction with any other person, corruptly solicit or receive, or agree to receive, for himself, or for any other person, any gift, loan, fee, reward, or advantage whatever as an inducement to, or reward for, or otherwise on account of any member, officer, or servant of a public body as in this Act defined, doing or forbearing to do anything in respect of any matter or transaction whatsover, actual or proposed, in which the said public body is concerned, shall be guilty of a misdemeanour.

"Every person who shall by himself or by or in conjunction with any other person corruptly give, promise, or offer any gift, loan, fee, reward, or advantage whatsoever to any person, whether for the benefit of that person or of another person, as an inducement to or reward for or otherwise on account of any member, officer, or servant of any public body as in this Act defined, doing or forbearing to do anything in respect of any matter or transaction whatsoever, actual or proposed, in which such public body as aforesaid is concerned, shall be guilty of a misdemeanour." (52 & 53 Vic., C. 69, S. 1).

With regard to the salary paid to the sanitary inspector there is no rule, the sanitary authority having the fixing of the rumuneration offered to that officer; if however, the appointment is made subject to the approval of the Local Government Board, that Board may withhold its consent to the appointment until a reasonable salary is offered for such services.

The "order" of the Local Government Board as regards salaries is as follows:—

ART. 14.—The Sanitary Authority shall pay to every Officer such salary as may be approved by Us.

Provided always that the Sanitary Authority may, with our approval, pay to any Officer a reasonable compensation on account of extraordinary services, or other unforeseen or special circumstances connected with his duties or the necessities of the District.

ART. 15.—The salary of every Officer shall be payable up to the day on which he ceases to hold office and no longer, subject to any deduction which the Sanitary Authority may be entitled to make in respect of Article 13 of this Order; and in case he shall die whilst holding such office, the proportion of salary (if any) remaining unpaid at his death shall be paid to his personal representatives.

Provided that any Officer who may be suspended, and who may, without the previous removal of such suspension, resign or be removed under Article 9 or Article 10 of this Order, shall not be entitled to any salary from the date of such suspension.

ART. 16.—The salary assigned to every Officer shall be payable quarterly, according to the usual Feast Days in the year, namely, Lady Day, Midsummer Day, Michaelmas Day, and Christmas Day; but the Sanitary Authority may pay to him at the expiration of every calendar month such proportion as they may think fit, on account of the salary to which he would become entitled at the termination of the quarter.

ART. 17.—All salaries shall be considered as accruing from day to day, and be apportionable in respect of time accordingly, in pursuance of the provisions of "The Apportionment Act, 1870." (The Sanitary Officers (London) Order, 1891).

The list of duties prescribed by the Local Government Board for sanitary inspectors under the Sanitary Officers (London) Order, 1891, is as follows:—

ART. 19.—The following shall be the duties of a Sanitary Inspector as regards the District or part of a District for which he is appointed (in this Article referred to as "his district"):—

(1) He shall perform, either under the special directions of the Sanitary Authority, or (so far as authorised by the Sanitary Authority) under the directions of the Medical Officer of Health, or, in cases where no such directions are required, without such directions, all the duties specially imposed upon a Sanitary Inspector by any Statute or Statutes, or by the Orders issued by Us, so far as the same apply to his office.

(2) He shall attend all meetings of the Sanitary Authority when so required.

(3) He shall by inspection of his district, both systematically at certain periods, and at intervals as occasion may require, keep himself informed in respect of the nuisances existing therein that require abatement.

(4) On receiving notice of the existence of any nuisance within his district, or of the breach of any byelaws or regulations made by the Sanitary Authority for the suppression of nuisances, or of any byelaws made by the London County Council which it is the duty of the Sanitary Authority to enforce, he shall, as early as practicable, visit the spot, and inquire into such alleged nuisance or breach of byelaws or regulations.

(5) He shall report to the Sanitary Authority any noxious or offensive businesses, trades, or manufactories established within his district, and the breach or non-observance of any byelaws or regulations made in respect of the same.

(6) He shall from time to time, and forthwith upon complaint, visit and inspect the shops and places in which is exposed for sale, or in which is deposited for the purpose of sale or of preparation for sale, any animal, or any article, whether solid or liquid, intended for the food of man, and examine any such animal or article which may be therein. If any such animal or article appears to him to be diseased, or unsound, or unwholesome, or unfit for the food of man, he shall seize and carry away the same himself or by an assistant, in order to have the same dealt with by a Justice according to the provisions of Section 47 of the Public Health (London) Act, 1891: Provided that in any case of doubt arising under this clause, he shall report the matter to the Medical Officer of Health, with the view of obtaining his advice thereon.

(7) He shall, when and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under "The Sale of Food and Drugs Act, 1875," and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings prescribed by that Act.

(8) Whenever it appears to him that the intervention of the Medical Officer of Health is necessary in connection with any nuisance, he shall forthwith inform such Officer thereof. He shall also,

subject to the directions of the Sanitary Authority, attend to the instructions of the Medical Officer of Health with respect to any measures which can be lawfully taken by a Sanitary Inspector under the Public Health (London) Act, 1891, or under any other Statute or Statutes.

(9) He shall enter from day to day, in a book to be provided by the Sanitary Authority, particulars of his inspections and of the action taken by him in the execution of his duties. He shall also keep a book or books, to be provided by the Sanitary Authority, so arranged as to form, as far as possible, a continuous record of the sanitary condition of each of the premises in respect of which any action has been taken under the Public Health (London) Act, 1891, or under any other Statute or Statutes, and shall keep any other systematic records that the Sanitary Authority may require.

(10) He shall at all reasonable times, when applied to by the Medical Officer of Health, produce to him his books, or any of them, and render to him such information as he may be able to furnish with respect to any matter to which the duties of Sanitary Inspector relate.

(11) He shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within his district.

(12) In matters not specifically provided for in this Order, he shall observe and execute any instructions issued by Us, and the lawful orders and directions of the Sanitary Authority, applicable to his office.

ART. 20.—Where in any District there shall be two or more Sanitary Inspectors nothing in this Order shall be deemed to prevent the Sanitary Authority from distributing among them the duties directed by this Order to be performed by a Sanitary Inspector.

The General Order of the Local Government Board, dated 23rd March, 1891, as regards the duties of rural and urban inspectors of nuisances, is as follows:—

ART. 19.—The following shall be the duties of an Inspector of Nuisances:—

(1) He shall perform, either under the special directions of the anitary Authority, or (so far as authorised by the Sanitary Authority)

under the directions of the Medical Officer of Health, or, in cases where no such directions are required, without such directions, all the duties specially imposed upon an Inspector of Nuisances by the Public Health Act, 1875, or by any other Statute or Statutes, or by the Orders of the Local Government Board, so far as the same apply to his office.

(2) He shall attend all meetings of the Sanitary Authority when so required.

(3) He shall by inspection of the District, both systematically at certain periods, and at intervals as occasion may require, keep himself informed in respect of the nuisances existing therein that require abatement.

(4) On receiving notice of the existence of any nuisance within the District, or of the breach of any byelaws or regulations made by the Sanitary Authority for the suppression of nuisances, he shall, as early as practicable, visit the spot, and inquire into such alleged nuisance or breach of byelaws or regulations.

(5) He shall report to the Sanitary Authority any obnoxious or offensive businesses, trades, or manufactories established within the District, and the breach or non-observance of any byelaws or regulations made in respect of the same.

(6) He shall report to the Sanitary Authority any damage done to any works of water supply, or other works belonging to them, and also any case of wilful or negligent waste of water supplied by them, or any fouling by gas, filth, or otherwise, of water used for domestic purposes.

(7) He shall from time to time, and forthwith upon complaint, visit and inspect the shops and places kept or used for the preparation or sale of butchers' meat, poultry, fish, fruit, vegetables, corn, bread, flour, milk, or any other article to which the provisions of The Public Health Act, 1875, in this behalf shall apply, and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or other article as aforesaid, which may be therein; and in case any such article appear to him to be intended for the food of man, and to be unfit for such food, he shall cause the same to be seized, and take such other proceedings as may be necessary in order to have the same dealt with by a Justice: Provided that in any case of doubt arising under this clause, he shall report the matter to the Medical Officer of Health, with the view of obtaining his advice thereon.

(8) He shall, when, and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under "The Sale of Food and Drugs Act, 1875," and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings prescribed by that Act.

(9) He shall give immediate notice to the Medical Officer of Health of the occurrence within the District of any contagious, infectious, or epidemic disease; and whenever it appears to him that the intervention of such Officer is necessary in consequence of the existence of any nuisance injurious to health, or of any overcrowding in a house, he shall forthwith inform the Medical Officer of Health thereof.

(10) He shall, subject to the directions of the Sanitary Authority, attend to the instructions of the Medical Officer of Health with respect to any measures which can be lawfully taken by an Inspector of Nuisances under The Public Health Act, 1875, or under any other Statute or Statutes, for preventing the spread of any contagious, infectious, or epidemic disease of a dangerous character.

(11) He shall enter from day to day, in a book to be provided by the Sanitary Authority, particulars of his inspections and of the action taken by him in the execution of his duties. He shall also keep a book or books, to be provided by the Sanitary Authority, so arranged as to form, as far as possible, a continuous record of the sanitary condition of each of the premises in respect of which any action has been taken under The Public Health Act, 1875, or under any other Statute or Statutes, and shall keep any other systematic records that the Sanitary Authority may require.

(12) He shall at all reasonable times, when applied to by the Medical Officer of Health, produce to him his books, or any of them, and render to him such information as he may be able to furnish with respect to any matter to which the duties of Inspector of Nuisances relate.

(13) He shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within the District.

(14) He shall, if directed by the Sanitary Authority to do so, act as Officer of the said Authority as Local Authority under the Con-

tagious Diseases (Animals) Act, 1886, and any Orders or Regulations made thereunder.

(15) In matters not specifically provided for in this Order, he shall observe and execute all the lawful orders and directions of the Sanitary Authority, and the Orders of the Local Government Board which may be hereafter issued, applicable to his office.

It is to be regretted that sanitary authorities have not always sought to appoint the person best fitted for the post of inspector, but rather, they have too frequently appointed the man who could command the greatest influence with its members without the slightest regard to his qualifications, except perhaps that he had been unsuccessful in some other business or occupation.

Legislature has recognised this necessity of appointing men with some knowledge of the duties appertaining to the office in the Public Health (London) Act, 1891, as will be gathered by the following clause:—

A sanitary inspector appointed after the first day of January one thousand eight hundred and ninety-five shall be holder of a certificate of such body as the Local Government Board may from time to time approve, that he has by examination shown himself competent for such office, or shall have been, during three consecutive years preceding the year one thousand eight hundred and ninety-five, a sanitary inspector or inspector of nuisances of a district in London, or of an urban sanitary district out of London containing according to the last published census a population of not less than twenty thousand inhabitants (54 & 55 Vic., C. 76, Section 108).

A person to be fully competent to perform the duties of a sanitary inspector or inspector of nuisances should have the following qualifications:—

He should be the owner of a good sound constitution and be able to follow the rules laid down to preserve it, including temperance.

He should be able to write legibly, spell correctly and have a fair knowledge of arithmetic.

He should have a thorough knowledge of building construction, including plumbing, and the methods of water-supply and drainage, also the proper principles of ventilation of rooms, and should know the best and most suitable sanitary appliances to use under varied circumstances.

He should have an observant eye, a quick ear and a sensitive nose, and be able at once to detect any defective or faulty sanitary arrangements of dwellings and other buildings.

He should be thoroughly acquainted with the work of the various Public Health Acts and Model Bye-laws relating to the duties of sanitary inspectors.

He must make himself acquainted with the various kinds of infectious disease, and know the best means to adopt for preventing the spread of such diseases.

He should acquire a knowledge of the different kinds of disinfectants in use, and know those best fitted for safely and effectually disinfecting houses and fever localities.

He should have a thorough knowledge as to the different methods adopted for the collection and disposal of house and other refuse.

He should be of pleasing address and in his dealings with the public he should be calm and collected, learn to restrain his temper and to endure hard speeches.

He should bear himself with a sympathetic aspect to the many bereaved widows, mothers and orphan children he so frequently meets in the performance of his duties. Civility and kindness must characterise all his actions, and rude behaviour or supercilious officialism should find no place in his conduct.

The growing importance of the duties of sanitary inspectors and the necessity for a standard of proficiency in persons applying for such offices, led the Sanitary Institute to establish voluntary examinations for the purpose of granting certificates of competency to surveyors and inspectors and with a view to affording information to inspectors and others desirous of becoming qualified in this work, I append the following particulars respecting the Institute's examinations:—

Each Examination occupies a portion of two days. On the first day, the Examination consists of written papers only. Inspectors of Nuisances occupy three hours, viz., usually from 11 a.m. to 2 p.m. On the second day the Examination usually commences at 11 a.m., and is *vivâ voce*, with one or more questions to be answered in writing, if deemed necessary.

Every Candidate is required to furnish the Board of Examiners with satisfactory testimonials as to age and personal character, and to give two weeks' notice previous to presenting himself for Examination. The fee for Examination must be paid to the Secretary, by Post-Office order or otherwise; 10*s.* 6*d.* on making application, and the remainder at least one week before the day of Examination. On receipt of the fee, a ticket will be forwarded admitting to the Examination.

No one under 21 years of age is admitted to the Examination.

A Certificate of Competency, signed by the Examiners and bearing the Seal of the Institute, is granted to each successful Candidate; but it must be distinctly understood that no Certificate will be granted to any Candidate unless he can write legibly, spell correctly, and possesses a fair knowledge of arithmetic, so that he may be able to prepare a report on

any subject connected with his duties, creditable to himself and to the Authority employing him.

The fee payable for the Examination is :—£3 3*s*.

But when the Examinations are held in Provincial Towns, £1 1*s*. extra will be charged to the Candidate in order to cover the expenses incurred in holding an examination out of London.

Unsuccessful Candidates are allowed to present themselves at any other Examination within twelve months on payment of half fees.

Syllabus of Subjects.

The Provisions of the Acts and Model Bye-laws relating to the duties of Inspector of Nuisances.

A knowledge of what constitutes a Nuisance.

Methods of Inspection of Dwellings, Cellar Dwellings, Dairies, Milk-shops, Markets, Slaughter-houses, Cow-sheds, and Nuisances especially connected with Trades and Manufactories.

The Regulations affecting persons suffering or recovering from Infectious Diseases, and some knowledge of such diseases—The principles of ventilation, and simple methods of Ventilating Rooms —Measurement of Cubic Space.

Disinfectants and Methods of Disinfection.

A Knowledge of the General Duties of the Office, and Methods of keeping the necessary Books and Records.

Writing and Spelling.

The proper conditions of good Drainage—The advantages and disadvantages of various Sanitary Appliances for Houses—Inspection of Builders' and Plumbers' work—Scavenging and the Disposal of Refuse.

The Physical Characteristics of good Drinking Water—the various ways in which it may be polluted, by Damage to Supply Works or in Houses, and the means of preventing pollution—Methods of Water Supply.

The Characteristics of good and bad Food (such as Meat, Fish, Milk, Vegetables).

The Sale of Food and Drugs Act.

The following is a specimen of the questions put to Candidates at the Examinations of the Sanitary Institute :—

1. Mention the principal Acts relating to the Public Health, and state briefly their most important provisions.

2. What is the order of procedure prescribed by the Sale of Food and Drugs Act in obtaining for Analysis samples of articles suspected of being adulterated ?

3. Describe some simple means of ventilating sleeping rooms which you think would be efficient. What do you consider overcrowding?

4. What are the physical characteristics of good drinking water ?

5. A house is found to be unhealthy, there are occasionally (not always) offensive smells, perceived both in the basement and in the upper rooms ; what is the most likely cause of this, and how would you proceed to investigate it ?

6. How should the soil pipes, sink pipes, and overflow pipes of a dwelling be dealt with so as to prevent any danger to the inmates ? What do you consider a proper fall for a six inch house drain ?

7. How would you proceed to disinfect a house in which a case of Typhus Fever or Small Pox had occurred.

8. In the inspection of a slaughter house, to what points would you specially direct your attention ? What are the requirements of a properly constructed slaughter house ?

9. A nuisance having been reported to exist in a certain house, what steps would you take ? What is meant by a recurring order ?

10. What are the provisions of the Public Health Act with regard to the exposure of infected persons and things ?

11. Describe the method of measuring the available air space in rooms. How much air-space is desirable ? How much should be insisted on.

12. How is water likely to be contaminated : —

(*a*) In wells in a country district ?

(*b*) In cisterns in houses ?

How can such contamination be prevented ?

13. Mention the various disinfectants in common use, and state

which you consider the best for particular purposes? Describe the methods of use and the precautions necessary.

14. What are the objects of a water trap? Describe good and bad forms of traps. What is meant by disconnection of waste-pipes, and what are its objects?

15. Describe the duties of an Inspector of Nuisances with regard to food exposed for sale in his district?

16. Describe any manufacturing process which is liable to be a nuisance. How would you deal with it?

THE ABATEMENT OF NUISANCES, PROCEDURE, &c.

THE Inspector being the executive officer of the Sanitary Authority for the abatement of nuisances, he becomes the eyes, ears and nose of that body, while the Medical Officer of Health is, in a sense, the head.

It will therefore be the duty as well as the privilege of the Inspector to work in unison with that officer and consult him upon all matters of importance, and by thus working together much misunderstanding confusion and duplication of labour will be avoided.

It is most desirable that the Inspector should attend the meetings of his Committee, as he will be able to afford its members any needful explanation with regard to his reports and other matters of enquiry, and thus expedite the business of the Meetings; besides which, he will become acquainted with the wishes of the members upon any particular subject relative to his duties.

The Inspector when entering upon a new appointment, should take an early opportunity of inspecting his district, and make himself thoroughly conversant with its sanitary condition and requirements. Having

obtained this information, he will then be at liberty to direct his attention to the amelioration of those conditions which appear to demand his first and serious consideration. To assist him in this work, he should endeavour to secure from the Surveyor's Department a map of the District over which he is to preside, with a plan showing the position and depth of the public sewers and private drains, and a list of the adopted and unadopted streets within his jurisdiction.

He should at all times attend promptly to any special complaints, and frequent inspections at uncertain periods are necessary as regards slaughter-houses and other similar businesses.

Anonymous complaints must be respected, and personal enquiry into the circumstances of such complaints is essential, always exercising the greatest care, otherwise the Inspector may be made the victim of much unpleasantness.

It is important that a house to house inspection should be instituted with the object of searching for nuisances, but in this work he will be called upon to use discretion and diplomacy, care being taken to inspect those houses first, that are situate in crowded localities and which have the appearance of dilapidation; by this I do not mean that the houses of the upper and middle classes will not require their share of attention, but it will be apparent that the former class of property will demand more frequent inspection, though the many adjuncts to the sanitary system of larger houses often render the occupation of such houses dangerous. It is a moot point whether a house to house inspection is authorised, but as the sanitary authority is required to cause an inspection to be made of the district to see what nuisances do exist and re-

quire abatement, the inference is, that such information can scarcely be obtained unless house to house inspections are resorted to, as the undermentioned clauses appear to direct :—

It shall be the duty of every local authority to cause to be made, from time to time, inspection of their district, with a view to ascertain what nuisances exist calling for abatement under the powers of this Act, and to enforce the provisions of this Act in order to abate the same; also to enforce the provisions of any Act in force within their district requiring fireplaces and furnaces to consume their own smoke (38 & 39 Vic., C. 55, Section 92).

It shall be the duty of every sanitary authority to cause to be made, from time to time, inspection of their district, with a view to ascertain what nuisances exist calling for abatement under the powers of this Act, and to enforce the provisions of this Act for the purposes of abating the same, and otherwise to put in force the powers vested in them relating to public health and local government, so as to secure the proper sanitary condition of all premises within their district (54 & 55 Vic., C. 76, Section 1).

Similar powers are given local authorities, in section 32 Housing of the Working Classes Act, 1890, with a view to ascertaining whether any dwelling-house is in a state so dangerous or injurious to health as to be unfit for human habitation, and if the authority fail in their duty, the County Council can do what is necessary and recover the expenses thus incurred from the defaulting sanitary authority, or the County Council may make a complaint to the Local Government Board, who will enforce the performance of the duty as provided.

The inspector when making house to house inspections should be furnished with a book having printed headings, this will facilitate the enquiries, besides keeping the particulars of each house entirely uniform and distinct. For all general purposes the following headings will be found sufficient :—

House to House Inspection Book.

Date of Inspection
Description and Situation of Premises inspected

Name of Occupier
Name and Address of "Owner" or Agent

No. of rooms Living
,, Sleeping
,, Underground, and for what used

No. of inmates Adults Males Females
,, Children
W.C. Accommodation

Drainage

Water Supply

Roofage and Spouting

Memorandum of Nuisance from any other Cause or general remarks

The word "nuisance" has a very extended meaning. It does not, however, include every common law nuisance; it is not necessary that a nuisance, to be within the act, should also be injurious to health, inasmuch as the terms are disjunctive, *nuisance or injurious*. It is sufficient if the nuisance is one which interferes with personal comfort.*

* The Bishop Auckland Local Board v. The Bishop Auckland Iron Company—Q. B. D., 138; 47 J. P. 389.—Stephen J.

For the purposes of the inspector it will be sufficient for him to remember the following definitions of nuisances, and these may be dealt with summarily :—

Any premises in such a state as to be a nuisance or injurious, or *dangerous* to health.

Any pool, ditch, gutter, watercourse, *cistern*, *watercloset*, *earth closet*, privy, urinal, cesspool, drain, *dung-pit*, or ashpit so foul or in such a state as to be a nuisance or injurious or *dangerous* to health.

Any animal kept in *such place or manner* as to be a nuisance or injurious or *dangerous* to health.

Any accumulation or deposit which is a nuisance or injurious or *dangerous* to health.

Any house or part of a house so overcrowded as to be injurious or *dangerous* to the health of the inmates, whether or not members of the same family.

Any such *absence from premises of water fittings* as is a nuisance by virtue of section 33 of the Metropolis Water Act, 1871, and

Any factory, workshop, or workplace which is not a factory subject to the provisions of the Factory and Workshop Act, 1878, relating to cleanliness, ventilation, and overcrowding, and

(i.) Is not kept in a cleanly state and free from effluvia arising from any drain, privy, earth-closet, water-closet, urinal, or other nuisance, or

(ii.) Is not ventilated in such a manner as to render harmless as far as practicable, any gases, vapours, dust, or other impurities generated in the course of the work carried on therein that are a nuisance or injurious or dangerous to health, or

(iii.) Is so overcrowded while work is carried on as to be injurious or dangerous to the health of those employed therein (54 & 59, Vic., C. 76, Section 2).

Any fireplace or furnace which does not as far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse or gas-work, or in any manufacturing or trade process whatsoever ; and

Any chimney (not being the chimney of a private dwelling-house), sending forth black smoke in such quantity as to be a nuisance (38 & 39 Vic., C. 55, Section 91).

An occupied house without a proper and sufficient supply of water

sha'l be a nuisance, and if it is a dwelling-house shall be deemed unfit for human habitation (54 & 55 Vic., C. 76, Section 91).

The words "dangerous, cistern, water-closet, earth-closet and dung-pit" do not appear in section 91 of the Public Health Act, 1875.

In the case of Reg. *v.* Parlby it was held that the expression "premises in such a state" referred to those which are decayed, dilapidated, dirty or out of order, as where the habits and ways of the tenants rendered them filthy or impregnated with disease or where foul matter has been allowed to soak into walls and floors or where so dilapidated as to be a source of danger to life or limb. Wills, J., 22 Q. B. D., 520; 53 J. P., 327.

Complaints will often be sent to the inspector of nuisances arising from the barking of dogs, cock-crowing and pianoforte playing, &c., but these are not nuisances over which the inspector has any control; the parties complaining should be referred to the Police who will advise them what to do.

Information of nuisances are directed to be given, as follows:—

Information of any nuisance under this Act in the district of any local authority may be given to such local authority by any person aggrieved thereby, or by any two inhabitant householders of such district, or by any officer of such authority, or by the relieving officer, or by any constable or officer of the police force of such district (38 & 39 Vic., C. 55, Section 93).

or as provided by 54 & 55 Vic., C. 76, section 3 "by any person, every officer of sanitary authority and relieving officers." The text simplifies the law by allowing any person to give information whether aggrieved or not. The following sections have reference to general nuisances:—

On the receipt of any information respecting the existence of a nuisance, the *local authority shall, if satisfied of the existence of a nuisance, serve a notice on the person by whose act, default or sufferance, the nuisance arises or continues*, or, if such person cannot be found, on the owner or occupier of the premises on which the nuisance arises, requiring him to abate the same within a time to be specified in the notice, and to execute such works and do such things as may be necessary for that purpose: provided:—

1st. That where the nuisance arises from the *want or defective construction of any structural convenience*, or where there is no occupier of the premises, *notice under this section shall be served on the owner.*

2nd. That where the person causing the nuisance cannot be found and it is clear that the nuisance does not arise or continue by the act, default or sufferance of the owner or occupier of the premises, the local authority may themselves abate the same without further order (38 & 39 Vic., C. 55, Section 94; and 54 & 55 Vic., C. 76, Section 4).

If the person on whom a notice to abate a nuisance has been served makes default in complying with any of the requisitions thereof within the time specified, or if the nuisance, although abated since the service of the notice is, in the opinion of the local authority, *likely to recur* on the same premises, the local authority shall cause a complaint relating to such nuisance to be made before a justice, and such justice shall thereupon issue a summons requiring the person on whom the notice was served to appear before a court of summary jurisdiction (38 & 39 Vic., C. 55, Section 95).

If the court is satisfied that the alleged nuisance exists, or that although abated it is likely to "recur" on the same premises, the court shall make an order on such person requiring him to comply with all or any of the requisitions of the notice, or otherwise to abate the nuisance within a time specified in the order, and to do any works necessary for that purpose; or an order prohibiting the recurrence of the nuisance and directing the execution of any works necessary to prevent the recurrence; or an order both requiring abatement and prohibiting the recurrence of the nuisance (38 & 39 Vic., C. 55, Section 96).

If either:—

The person on whom a notice to abate a nuisance has been served as aforesaid makes default in complying with any of the requisitions thereof within the time specified; or,

The nuisance although abated since the service of the notice, is, in the opinion of the sanitary authority, likely to recur on the same premises, the sanitary authority shall make a complaint, and the petty sessional court hearing the complaint, may make on such person a summary order (in this Act referred to as a nuisance order).

A nuisance order may be an abatement order, a prohibition order or a closing order, or a combination of such orders.

An abatement order may require a person to comply with all or any of the requisitions of the notice, or otherwise to abate the nuisance within a time specified in the order.

A prohibition order may prohibit the recurrence of a nuisance.

An abatement order or prohibition order shall, if the person on whom the order is made so requires, or the court considers it desirable, specify the works to be executed by such person for the purpose of abating or preventing the recurrence of the nuisance.

A closing order may prohibit a dwelling-house from being used for human habitation.

A closing order shall only be made where it is proved to the satisfaction of the court that by reason of a nuisance a dwelling-house is unfit for human habitation, and if such proof is given, the court shall make a closing order, and may impose a fine not exceeding twenty pounds.

A petty sessional court, when satisfied that the dwelling-house has been rendered fit for human habitation, may declare that it is so satisfied and cancel the closing order.

If a person fails to comply with the provisions of a nuisance order with respect to the abatement of a nuisance, he shall, unless he satisfies the court that he has used all due diligence to carry out such order, be liable to a fine not exceeding twenty shillings a day during his default; and if a person knowingly and wilfully acts contrary to a prohibition or closing order he shall be liable to a fine not exceeding forty shillings a day during such contrary action; moreover the sanitary authority may enter the premises to which a nuisance order relates, and abate or remove the nuisance, and do whatever may be necessary in execution of such order (54 & 55 Vic., C. 75, Section 5).

The words "structural convenience" appear to be such things as a landlord would provide in a house for the purpose of letting it to a tenant. Thus a owner was held liable for the defective construction of a privy,

Cook *v.* Montagu, 37 J. P. 53; and for water closets and sink drains, Parker *v.* Inge, 51 J. P. 20 (Macmorran).

The authority may cause an examination of drains, &c., for the purpose of satisfying themselves as to the source of a nuisance or whether work ordered has been satisfactorily carried out, as follows:—

On the written application of any person to a local authority, stating that any drain, water-closet, earth-closet, privy, ashpit or cesspool, on or belonging to any premises within their district is a nuisance or injurious to health (but not otherwise), the *local authority may*, by writing, empower their surveyor or inspector of nuisances, after twenty-four hours' written notice to the occupier of such premises, or in case of emergency without notice, to enter such premises, with or without assistants, and cause the ground to be opened, and examine such drain, water-closet, earth-closet, privy, ashpit or cesspool. If the drain, water-closet, earth-closet, privy, ashpit or cesspool on examination is found to be in proper condition, he shall cause the ground to be closed, and any damage done to be made good as soon as can be, and the expenses of the works shall be defrayed by the local authority. If the drain, water-closet, earth-closet, privy, ashpit or cesspool on examination appear to be in bad condition, or to require alteration or amendment, the local authority shall forthwith cause notice in writing to be given to the owner or occupier of the premises requiring him forthwith or within a reasonable time therein specified to do the necessary works; and if such notice is not complied with, the person to whom it is given shall be liable to a penalty not exceeding ten shillings for every day during which he continues to make default, and the local authority may, if they think fit, execute such works, and may recover in a summary manner from the owner the expenses incurred by them in so doing, or may by order declare the same to be private improvement expenses. (38 & 39 Vic., C. 55, Section 41).

The sanitary authority may examine any of the following works, that is to say, any water-closet, earth-closet, privy, ashpit or cesspool, and any water supply, sink, trap, siphon, pipe, or other works or apparatus connected therewith, upon any premises within their district, and for that purpose, or for the purpose of ascertaining the course of a drain, may at all reasonable times by day, after twenty-

four hours' notice has been served on the occupier of the premises, or if they are unoccupied on the owner, or in case of emergency without notice, enter on any premises, and cause the ground to be opened in any place they think fit, doing as little damage as may be.

If any such work as aforesaid is found on examination to be in accordance with this Act and the bye-laws of the county council and sanitary authority, and directions of the sanitary authority given in any notice under this Act, and in proper order and condition, the sanitary authority shall cause the same to be reinstated and made good as soon as may be, and shall defray the expenses of examination, reinstating, and making good the same, and pay full compensation for all damages or injuries done or occasioned by the examination; but if on examination any such work is found not to be in proper order or condition, or not to have been made or provided by any person according to the said bye-laws and directions, or to be contrary to this Act, the reasonable expenses of the examination shall be repaid to the sanitary authority by the person offending, and may be recovered by that authority in a summary manner (54 & 55 Vic., C. 76, Section 40).

The following clauses apply to particular nuisances:—

If a house within the district of a local authority appears to such authority, by the report of their surveyor or inspector of nuisances, to be without a sufficient water-closet, earth-closet, or privy, and an ashpit furnished with proper doors and coverings, the local authority shall, by written notice, require the owner or occupier of the house, within a reasonable time therein specified, to provide a sufficient water-closet, earth-closet, or privy, and an ashpit furnished as aforesaid, or either of them as the case may require (38 & 39 Vic., C. 55, Section 36).

It shall not be lawful newly to erect any house or to rebuild any house pulled down to or below the ground floor without a sufficient ashpit furnished with proper doors and coverings, and one or more proper and sufficient water-closets according as circumstances may require, furnished with suitable water supply and water supply apparatus, and with suitable trapped soilpan and other suitable works and arrangements, so far as may be necessary to ensure the efficient operation thereof (54 & 55 Vic., C. 76, Section 37).

If a water-closet or drain is so constructed or repaired as to be a nuisance, or injurious or dangerous to health, the *person who under-*

took or executed such construction or repair shall, unless he shows that such construction or repair was not due to any wilful act, neglect, or default, be liable to a fine not exceeding twenty pounds (54 & 55 Vic., C. 76, Section 42).

Where, on the certificate of the medical officer of health or of any two medical practitioners, it appears to any local authority that any house or part thereof is in such a filthy or unwholesome condition that the health of any person is affected or endangered thereby, or that the whitewashing, cleansing, or purifying of any house or part thereof would tend to prevent or check infectious disease, the local authority shall give notice in writing to the owner or occupier of such house or part thereof, to whitewash, cleanse, or purify the same as the case may require (38 & 39 Vic., C. 55, Section 46).

Where in any urban district it *appears to the inspector of nuisances* that any accumulation of manure, dung, soil, or filth or other offensive or noxious matter *ought to be removed*, he shall give notice to the person to whom the same belongs, or to the occupier of the premises whereon it exists, to remove the same; and if such notice is not complied with within twenty-four hours from the service thereof, the manure, dung, soil, or filth or matter referred to, shall be vested in and be sold or disposed of by the urban authority, and the proceeds thereof shall be applied in payment of the expenses incurred by them in the execution of this section; and the surplus (if any) shall be paid on demand to the owner of the matter removed (38 & 39 Vic., C. 55, Section 49).

This section corresponds with section 35 Public Health (London) Act, 1891, save that the time allowed for removal is 48 hours.

Any person who in any urban district—

Keeps any swine or pigstye in any dwelling-house, or so as to be a nuisance to any person; or

Suffers any waste or stagnant water to remain in any cellar or place within any dwelling-house for twenty-four hours after written notice to him from the urban authority to remove the same; or

Allows the contents of any water-closet, privy, or cesspool to overflow or soak therefrom,

shall for every such offence be liable to a penalty not exceeding forty shillings, and to a further penalty not exceeding five shillings

for every day during which the offence is continued, and the urban authority shall abate or cause to be abated every such nuisance, and may recover in a summary manner the expenses incurred by them in so doing from the occupier of the premises on which the nuisance exists (38 & 39 Vic., C. 55, Section 47).

A person shall not—

Feed or keep any swine in any locality, premises, or place which is unfit for the keeping of swine, or in which the feeding or keeping of swine may create a nuisance or be injurious to health, or

Permit any swine to stray or go about in any street or public place.

If any person acts in contravention of this section he shall be liable to a fine not exceeding forty shillings, and to forfeit the swine, and to a further fine not exceeding ten shillings for every day during which he continues such offence after notice from the sanitary authority to discontinue the same.

Any swine found straying or going about in any street or public place may be seized and removed by any constable.

Any premises within forty yards of any *street or public place* shall be deemed for the purpose of this section to be a place unfit for keeping swine (54 & 55 Vic., C. 55, Section 17).

Where two convictions against the provisions of any Act relating to the overcrowding of a house have taken place within a period of three months (whether the persons convicted were or were not the same) a court of summary jurisdiction may on the application of the local authority of the district in which the house is situated, direct the closing of the house for such period as the court may deem necessary (38 & 39 Vic., C. 55, Section 109; and 54 & 55 Vic., C. 76, Section 7).

The word "conviction" seems to imply not only that orders have been made for the abatement or prohibition of the nuisance but that fines have been imposed, as a mere order to abate is not a conviction.

Any person who, after the passing of this Act, establishes within the district of an urban authority, without their consent in writing any offensive trade; that is to say, the trade of—

Blood boiler, or

Bone boiler, or

Fellmonger. or
Soap boiler, or
Tallow melter, or
Tripe boiler, or

Any other noxious or offensive trade, business, or manufacture, shall be liable to a penalty not exceeding fifty pounds in respect of the establishment thereof, and any person carrying on a business so established shall be liable to a penalty not exceeding forty shillings for every day on which the offence is continued, whether there has or has not been any conviction in respect of the establishment thereof (38 & 39 Vic., C. 55, Section 112).

Where any candle-house, melting-house, melting-place, or soap-house, or any slaughter-house, or any building or place for boiling offal or blood, or for boiling, burning, or crushing bones, or any manufactory, building, or place used for any trade, business process, or manufacture causing effluvia, is certified to any urban authority by their medical officer of health, or by any two legally qualified medical practitioners, or by any ten inhabitants of the district of such urban authority, to be a nuisance or injurious to the health of any of the inhabitants of the district, such urban authority shall direct complaint to be made before a justice, who may summon the person by or on whose behalf the trade so complained of is carried on, to appear before a court of summary jurisdiction (38 & 39 Vic., C. 55, Section 114).

If any person—

Establishes anew the following businesses, or any of them ; that is to say, the business of blood boiler, bone boiler, manure manufacturer, soap boiler, tallow melter, or knacker ; or

Establishes anew, without the sanction of the county council, the following businesses or any of them ; that is to say, the business of fellmonger, tripe-boiler, slaughterer of cattle or horses, or any other business which the county council may declare by order confirmed by the Local Government Board, and published in the London Gazette to be an offensive business,

he shall be liable to a fine not exceeding fifty pounds in respect of the establishment thereof, and any person carrying on the same when established, shall be liable to a fine not exceeding fifty pounds for every day during which he so carries on the same (54 & 55 Vic., C. 76, Section 19).

Dr. Ballard has classified effluvium nuisances, as follows :—

(1) Keeping of animals.

(2) Slaughtering of animals.

(3) Other branches of industry in which animal matters or substances of animal origin are principally dealt with.

(4) Branches of industry in which vegetable matters are principally dealt with.

(5) Branches of industry in which mineral substances are principally dealt with.

(6) Branches of mixed origin in which mineral, vegetable, and animal substances are dealt with.

It shall not be lawful to let or occupy, or suffer to be occupied separately as a dwelling, any cellar (including for the purposes of this Act in that expression any vault or underground room) built or rebuilt after the passing of this Act, or which is not lawfully so let or occupied at the time of the passing of the Act (38 & 39 Vic., C. 55, Section 71).

It shall not be lawful to let or occupy, or suffer to be occupied separately as a dwelling, any cellar whatsoever, unless the following requisitions are complied with; (that is to say),

Unless the cellar is in every part thereof at least seven feet in height, measured from the floor to the ceiling thereof, and is at least three feet of its height above the surface of the street or ground adjoining or nearest to the same; and

Unless there is outside of and adjoining the cellar and extending along the entire frontage thereof, and upwards, from six inches below the level of the floor thereof up to the surface of the said street or ground, an open area of at least two feet and six inches wide in every part; and

Unless the cellar is effectually drained by means of a drain, the uppermost part of which is one foot at least below the level of the floor thereof; and

Unless there is appurtenant to the cellar the use of a water-closet, earth-closet, or privy and an ashpit, furnished with proper doors and coverings, according to the provisions of this Act; and

Unless the cellar has a fireplace with a proper chimney or flue, and an external window of at least nine superficial feet in area

clear of the sash frame, and made to open in a manner approved by the surveyor (except in the case of an inner or back cellar let or occupied along with a front cellar as part of the same letting or occupation, in which case the external window may be of any dimensions not being less than four superficial feet in area clear of the sash frame).

Provided that in any area adjoining a cellar there may be steps necessary for access to such cellar, if the same be so placed as not to be over, across, or opposite to the said external window, and so as to allow between every part of such steps, and the external wall of such cellar, a clear space of six inches at the least, and that over or across any such area there may be steps necessary for access to any building above the cellar to which such area adjoins, if the same be so placed as not to be over, across, or opposite to any such external window (38 & 39 Vic., C. 55, Section 72).

Any person who lets, occupies, or knowingly suffers to be occupied for hire or rent, any cellar contrary to the provisions of this Act shall be liable for every such offence to a penalty not exceeding twenty shillings for every day during which the same continues to be so let or occupied after notice in writing from the local authority in this behalf (38 & 39 Vic., C. 55, Section 73).

Any cellar in which any person passes the night shall be deemed to be occupied as a dwelling within the meaning of this Act (38 & 39 Vic., C. 55, Section 74).

Any underground room, which was not let or occupied separately as a dwelling before the passing of this Act, shall not be so let or occupied unless it possesses the following requisites ; that is to say,

Unless the room is in every part thereof at least seven feet high, measured from the floor to the ceiling, and has at least three feet of its height above the surface of the street or ground adjoining or nearest to the room : Provided that, if the width of the area hereinafter mentioned is not less than the height of the room from the floor to the said surface of the street or ground, the height of the room above such surface may be less than three feet, but it shall not in any case be less than one foot, and the width of the area need not in any case be more than six feet ;

Unless every wall of the room is constructed with a proper damp course, and, if in contact with the soil, is effectually secured against dampness from that soil ;

Unless there is outside of and adjoining the room, and extending along the entire frontage thereof, and upwards from six inches below the level of the floor thereof, an open area properly paved at least four feet wide in every part thereof: Provided that in the area there may be placed steps necessary for access to the room, and over and across such area there may be steps necessary for access to any building above the underground room, if the steps in each case be so placed as not to be over or across any external window;

Unless the said area and the soil immediately below the room are effectually drained;

Unless, if the room has a hollow floor, the space beneath it is sufficiently ventilated to the outer air;

Unless any drain passing under the room is properly constructed of a gas-tight pipe;

Unless the room is effectually secured against the rising of any effluvia or exhalation;

Unless there is appurtenant to the room the use of a water-closet and a proper and sufficient ash-pit;

Unless the room is effectually ventilated;

Unless the room has a fire-place with a proper chimney or flue;

Unless the room has one or more windows opening directly into the external air, with a total area clear of the sash frames equal to at least one-tenth of the floor area of the room, and so constructed that one-half at least of each window of the room can be opened, and the opening in each case extends to the top of the window.

If any person lets or occupies, or continues to let, or knowingly suffers to be occupied, any underground room contrary to this enactment, he shall be liable to a fine not exceeding twenty shillings for every day during which the room continues to be so let or occupied (54 & 55 Vic., C. 76, Section 96).

Any officer of a sanitary authority appointed or determined by that authority for the purpose shall, without any fee or reward, report to the sanitary authority, at such times and in such manner as the sanitary authority may order, all cases in which underground rooms are occupied contrary to this Act in the district of such authority.

Any such officer or any other person having reasonable grounds for believing that any underground room is occupied in contravention of this Act may enter and inspect the same at any hour by day; and

if admission is refused to any person other than an officer of the sanitary authority, the like warrant may be granted by a justice under this Act as in case of refusal to admit any such officer.

A warrant of a justice authorising an entry into an underground room may authorise the entry between any hours specified in the warrant (54 & 55 Vic., C. 76, Section 97).

Where two *convictions* for an offence relating to the occupation of an underground room as a dwelling have taken place within a period of three months (whether the persons convicted were or were not the same), a petty sessional court may direct the closing of the underground room for such period as the court may deem necessary, or may empower the sanitary authority of the district permanently to close the same, in such manner as they think fit, at their own cost (54 & 55 Vic., C. 76, Section 98).

It would appear that section 96 of the Public Health (London) Act, 1891, referred only to underground rooms occupied as dwellings before the passing of this Act; it should, however, be read in connection with sub-section 3 of the section mentioned, which provides that at the expiration of six months, after the commencement of this Act, it shall extend to underground rooms let or occupied *separately as dwellings*, before this Act was passed.

The inspector must observe that it is only when underground rooms are *separately occupied as dwellings* that the Act applies, as an underground room occupied in conjunction with a room or rooms on a higher floor does not constitute separate occupation, but where two or more underground rooms are occupied together, he may consider each such room to be separately occupied, unless, as before stated, the rooms are occupied in conjunction with rooms on a higher floor.

Any fire-place or furnace which does not, so far as is practicable, consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever; and—

Any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance—

Shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act: Provided—

That where a person is summoned before any court in respec of a nuisance arising from a fire-place or furnace which does not consume the smoke arising from the combustible used in such fire-place or furnace, the court shall hold, that no nuisance is created within the meaning of this Act, and dismiss the complaint, if it is satisfied that such fire-place or furnace is constructed in such manner as to consume, as far as practicable, having regard to the *nature* of the manufacture or trade, all smoke arising therefrom, and that such fire-place or furnace has been carefully attended to by the person having the charge thereof" (38 & 39 Vic., C. 55, Section 91).

Nothing in this Act shall be construed to extend to mines of different descriptions, so as to interfere with, or to obstruct the *efficient* working of the same; nor to the smelting of ores and minerals, nor to the calcining, puddling, and rolling of iron and other metals, nor to the conversion of pig-iron into wrought-iron, so as to *obstruct* or interfere with any of such processes respectively (38 & 39 Vic., C. 55, Section 334).

Every furnace employed in the working of engines by steam, and every furnace employed in any public bath or washhouse, or in any mill, factory, printing house, dyehouse, iron foundry, glasshouse, distillery, brewhouse, sugar refinery, bakehouse, gas-works, water-works, or other buildings used for the purpose of trade or manufacture (although a steam engine be not used or employed therein), shall be constructed so as to consume or burn the smoke arising from such furnace.

If any person being the owner or occupier of the premises, or being a foreman or other person employed by such owner or occupier—

(*a*) Uses any such furnace which is not constructed so as to consume or burn the smoke arising therefrom; or

(*b*) So negligently uses any such furnace as that the smoke arising therefrom is not effectually consumed or burnt; or

(*c*) Carries on any trade or business which occasions any noxious or offensive effluvia, or otherwise annoys the neighbourhood or inhabitants, without using the best practicable means for preventing or counteracting such effluvia or other annoyance;

such person shall be liable to a fine not exceeding five pounds, and on a second conviction to a fine of ten pounds, and on each subsequent conviction to a fine double the amount of the fine imposed on the last preceding conviction.

Every steam engine and furnace used in the working of any steam vessel on the River Thames, either above London Bridge, or plying to and fro between London Bridge and any place on the River Thames westward of the Nore light, shall be constructed so as to consume or burn the smoke arising from such engine and furnace; and if any such steam engine or furnace is not so constructed, or being so constructed is wilfully or negligently used so that the smoke arising therefrom is not effectually consumed or burnt, the owner or master of such vessel shall be liable to a fine not exceeding five pounds, and on a second conviction to a fine of ten pounds, and on every subsequent conviction to a fine of double the amount of the fine imposed on the last preceding conviction.

Provided that in this section the words "consume or burn the smoke," shall not be held in all cases to mean, "consume or burn all the smoke," and the court hearing an information against a person may remit the fine if of opinion that such person has so constructed his furnace as to consume or burn, as far as possible, all the smoke arising from such furnace, and has carefully attended to the same, and consumed or burned, as far as possible, the smoke arising from such furnace.

It shall be the duty of every sanitary authority to enforce the provisions of this section, and an information shall not be laid for the recovery of any fine under this section except under the direction of a sanitary authority.

The provisions of this Act with respect to the admission of the sanitary authority into any premises for any purposes in relation to nuisances, and with respect to the giving of information of a nuisance, shall apply in like manner as if they were herein re-enacted, and i terms made applicable to this section.

This section shall extend to the port of London, and as respects the port shall be enforced by the port sanitary authority.

Nothing in this section shall alter or repeal any of the provisions of the City of London Sewers Act, 1851, or of the Whitechapel Improvement Act, 1853 (54 & 55 Vic., C. 76, Section 23).

(*a*) Any fire-place or furnace which does not, as far as practicable, consume the smoke arising from the combustible used therein,

and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork or in any manufacturing or trade process whatsoever; and

(*b*) Any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance;

shall be nuisances liable to be dealt with summarily under this Act, and the provisions of this Act relating to those nuisances shall apply accordingly:

Provided that the court, hearing a complaint against a person in respect of a nuisance arising from a fire-place or furnace which does not consume the smoke arising from the combustible used in such fire-place or furnace, shall hold that no nuisance is created, and dismiss the complaint, if satisfied that such fire-place or furnace is constructed in such manner as to consume as far as practicable, having regard to the nature of the manufacture or trade, all smoke arising therefrom, and that such fire-place or furnace has been carefully attended to by the person having the charge thereof (54 & 55 Vic., C. 76, Section 24).

In a case reported, 22 Q. B. D. 736, the defendant, who was the owner and occupier of certain premises in the Metropolis used for the purpose of manufacture was summoned under 16 & 17 Vic., C. 128, section 1, for negligently using a furnace in such premises so that the smoke arising therefrom was not effectually consumed. The furnace in question was constructed so as to consume its own smoke, if carefully used; and the emission of smoke complained of was caused by the carelessness of the stoker employed by the defendant to attend to the furnace. The defendant was not personally guilty of any negligence in connection with the matter. It was held that defendant was not criminally responsible for the negligence of his servant, and could not be convicted of the offence.

Upon similar words in a local act, it was held that where the owner used a furnace properly constructed,

and employed a competent person to use it, but without his knowledge his servant negligently used it so that smoke was not consumed, the servant only, and not the master, could be convicted. Wilcock *v.* Sands, 32 J. P. 565.

A furnace which is properly constructed may be so improperly used as to render the person using it liable to a fine under this section. Dumfries Commissioners *v.* Murphy, 11 Ct. of Sess. Cas., 4th series, p. 694.

The following "specification" will assist the officer in preparing his notices for the abatement of smoke nuisances :—

Complaint :—

The chimney known as (not being the chimney of a private dwelling-house) sending forth black smoke in such a quantity as to be a nuisance.

Specification :—

Provide and thereafter maintain smoke consuming apparatus to each fire-place or furnace for which the said chimney is used, and thenceforth cause the same apparatus and fire-place or furnace and the fires in each fire-place or furnace to be carefully and regularly attended so as to prevent the said chimney from sending forth black smoke in such a quantity as to be a nuisance.

Signed

Sanitary Inspector (or Inspector of Nuisances).

The pollution of the atmosphere due to the emission of smoke from the chimneys of manufactories is a matter which will often give rise to complaints and one upon which the inspector must proceed with caution. The reason for this course of action is not far to seek,

as the manufacturer, the smoke producer, may be found represented on every town council, local board, &c., and his influence to prevent any steps being taken which will suppress such nuisances, is often felt.

The emission of smoke from boiler furnaces may be, and often is, entirely prevented by the adoption of suitable apparatus and proper attention as to firing.

The production of smoke is no economy to the manufacturer, but really a great waste of money in the shape of unconsumed fuel.

It is frequently asserted, generally by the manufacturer, that the consumption of smoke causes the emission of something more injurious, though less visible. The fact is, that the "lightest" smoke consists of the same substances as the "darkest," but the proportion of the mixture differs. The bulk of all furnace smoke, whether light or dark, is colourless carbonic acid gas, the same gas that man and animals exhale and no more injurious, and in this float the particles of soot or unconsumed carbon which alone constitutes the visible part of the "ordinary" smoke.

It is the number of these particles, in a given volume of smoke, that determines its density and shade.

The inspector must understand that the rapidity of the consumption of all materials depends upon the quantity of air that can be mixed with them, as they change under the influence of heat from the solid to the gaseous form.

The finer the "slack" the more it has to be spread, the thinner the fires have to be kept upon the grate-bars and the more frequently it has to be broken up. But the more "slack" is spread, the greater are the number of particles of coal suddenly converted into gas, and the more irregular are both the production of the

flame and the consequent call for air to supply the oxygen for combination with the gaseous carbon of the coal. The same thing takes place with each breaking up of the fire, it is therefore obvious that an uniform draught cannot meet these ununiform conditions. The opening of a furnace door will do something, but this tends to cool the furnace by lessening the draught through the bars, and in a furnace where increased length is required in order to obtain the extended surface for spreading the fuel required by thin firing, the difficulty of equal distribution of this volume of air to every particle of carbon at the instant of its incandescence is obviously greater than in a short furnace.

The apparatus in general use for preventing black smoke is one of two kinds, the "Sprinkling" or "Coking" machine.

The "Sprinkling" machines are supposed to give greater rate of combustion by throwing the fuel in a continuous or nearly continuous shower, on to the bars, and thus obtaining quick ignition.

The "Coking" machines introduce the coal into the furnace slowly, and in an unbroken stream, and an arch of fire-brick is sometimes used to ignite the upper surface of this stream by radiation and by contact with its sides and in other cases using a step grate or other means by which to retain some incandescent fuel at the front of the furnace over or past which the stream of fresh fuel is caused to pass, thus extending the igniting surface.

The latter machines are considered best for preventing black smoke.

A code of rules for the guidance of inspectors whose duties include the taking of smoke observations are often required and I append a copy of those drawn up

by the Sanitary Committee of the Bolton Corporation for the use of their inspectors :—

(1) Whenever an inspector sees a chimney sending out black smoke in large quantities, he is to make a note thereof in his pocket book.

(2) As early as possible thereafter the inspector in whose district the chimney is situated is to take a thirty minutes' observation of the chimney, and record the usual particulars in his note book of such observations.

(3) If dense black smoke issues from the chimney for as much as 2½ minutes of the half hour, or moderate black smoke for as much as 10 minutes, the inspector at the close of his observation should enter the works to which the chimney belongs, with a view of ascertaining the cause of the nuisance, and he should make a note of what he sees and is stated to him there.

On returning to the office, enter in the Smoke Observation Book, particulars of the observation, make a copy thereof on a form and send such copy by post to the occupier of the works, or a copy of the observation may be served personally before leaving the works.

Smoke Observation Form.

Name of owner

Description and situation of works

Date Time

Duration of black smoke

Inspector.

(4) Enter the nuisance in the report book for the next meeting of the Sanitary Committee, and have ready at

The Sanitary Committee of the Bolton Corporation ordered a Return to be prepared of all Steam Boilers in operation in the Borough, with such particulars as could be obtained of their dimensions and details of work, as follows :—

Occupiers.	Situation of Premises.	Trade for which used.	Number and Dimensions of Boilers in daily use.					Tons of Coal used per week of 60 hours.		What smoke consuming apparatus (if any)
			Number.	Length.	Diameter at Water Level.	Depth of Water evaporated in half an hour.	Breadth at Water Level.	Burgy.	Slack.	

such meeting the requisite notice to abate properly filled up.

(5) As soon as possible after the Council Meeting serve in the usual way a 14 days' notice to abate.

(6) At the expiration of 14 days' notice take another 30 minutes' observation in like manner as before, and if dense black smoke on this observation is emitted for as much as $2\frac{1}{2}$ minutes, or moderate black smoke for as much as 10 minutes, proceed in the same manner as directed by No. 3 above.

(7) Thereupon arrange with the Town Clerk for a summons being issued immediately.

NOTE.—There is no intention to sanction by these instructions the commission of the nuisance to the above or any other degree.

They are intended to cause for the present worse cases to be first dealt with.

Inspectors should be careful not to give the impression that abatement to the degree specified will be permanently satisfactory, as there is sufficient evidence before the Council that the issue of smoke from manufacturing chimneys may be so abated as to be imperceptible throughout both day and night, with but slight exceptions.

Upon receipt of information as to nuisances, or when in search of nuisances without complaint, it must not be forgotten that the law does not give the inspector the power to enter premises without permission, nor is it competent for a local authority, except in certain cases, to enter premises to execute works until after disobedience of an order of the justices; but if admission is refused to premises, a justice, if satisfied by information on oath that a nuisance exists thereon, will authorise the inspector to enter the premises complained of in order to make an inspection or to execute works ordered. The following sections give the local authority or their officers power of entry :—

The local authority, or any of their officers, shall be admitted into any premises for the purposes of examining as to the existence of any nuisance thereon, or of enforcing the provisions of any Act in force within the district requiring fire-places and furnaces to consume their own smoke, at any time between the hours of nine in the forenoon and six in the afternoon, or in the case of a nuisance arising in respect of any business, then at any hour when such business is in progress or is usually carried on.

Where under this Act a nuisance has been ascertained to exist, or an order of abatement or prohibition has been made, the local authority or any of their officers shall be admitted from time to time into the premises between the hours aforesaid, until the nuisance is abated, or the works ordered to be done are completed, as the case may be.

Where an order of abatement or prohibition has not been complied with, or has been infringed, the local authority, or any of their officers, shall be admitted from time to time at all reasonable hours, or at all hours during which business is in progress or is usually carried on, into the premises where the nuisance exists, in order to abate the same.

If admission to premises for any of the purposes of this section is refused, any justice on complaint thereof on oath by any officer of the local authority (made after reasonable notice in writing of the intention to make the same has been given to the person having custody of the premises), may, by order under his hand, require the person having custody of the premises to admit the local authority, or their officer, into the premises during the hours aforesaid, and if no person having custody of the premises can be found, the justice shall, on oath made before him of that fact, by order under his hand authorise the local authority or any of their officers to enter such premises during the hours aforesaid.

Any order made by a justice for admission of the local authority or any of their officers on premises shall continue in force until the nuisance has been abated, or the work for which the entry was necessary has been done (38 & 39 Vic., C. 55, Section 102).

The sanitary authority shall have a right to enter from time to time any premises—

For the purpose of examining as to the existence thereon of any nuisance liable to be dealt with summarily under this Act, at any hour by day, or in the case of a nuisance arising in respect

of any business, then at any hour when that business is in progress or is usually carried on, and

Where under this Act a nuisance has been ascertained to exist, or a nuisance order has been made, then at any such hour as aforesaid, until the nuisance is abated, or the works ordered to be done are completed, or the closing order is cancelled, as the case may be, and

Where a nuisance order has not been complied with, or has been infringed, at all reasonable hours, including all hours during which business therein is in progress or is usually carried on, for the purpose of executing the order (54 & 55 Vic., C. 76, Section 10).

Where a house or part of a house is alleged to be overcrowded so as to be a nuisance liable to be dealt with summarily under this Act, a warrant under this section may authorise an entry into such house or part of a house at any hour of the day or night specified in the warrant (54 & 55 Vic., C. 76, Section 115, Sub-section 6).

The difficulty of gaining admission to premises for the purpose of inspection as to overcrowding has long been felt under the Public Health Act, 1875, but this is rectified as regards the Metropolis by the clause just referred to, which authorises the entering of premises, in such cases, by day or night upon justices' warrant. The expression "day" as defined by section 141 of the Public Health (Lon.) Act, 1891, means the period between 6 a.m. and 9 p.m.

Considerable trouble is often experienced in enforcing the abatement of nuisances caused by the acts or default of two or more persons, unless it can be proved that the separate contributions of the person proceeded against causes a substantial nuisance; proof of this is often, from the nature of the case, almost impossible, hence the power to proceed against any one or more of such persons, as follows :—

Where any nuisance under this Act appears to be wholly or par-

tially caused by the acts or defaults of two or more persons, it shall be lawful for the local authority or other complainant to institute proceedings against any one of such persons, or to include all or any two or more of such persons in one proceeding; and any one or more of such persons may be ordered to abate such nuisance, so far as the same appears to the court having cognizance of the case to be caused by his or their acts or defaults, or may be prohibited from continuing any acts or defaults which, in the opinion of such court, contribute to such nuisance, or may be fined or otherwise punished, notwithstanding that the acts or defaults of any one of such persons would not separately have caused a nuisance; and the costs may be distributed as to such court may appear fair and reasonable.

Proceedings against several persons included in one complaint shall not abate by reason of the death of any among the persons so included, but all such proceedings may be carried on as if the deceased person had not been originally so included.

Whenever in any proceeding under the provisions of this Act relating to nuisances, whether written or otherwise, it becomes necessary to mention or refer to the owner or occupier of any premises, it shall be sufficient to designate him as the "owner" or "occupier" of such premises, without name or further description.

Nothing in this section shall prevent persons proceeded against from recovering contribution in any case in which they would now be entitled to contribution by law (38 & 39 Vic., C. 55, Section 255; also 54 & 55 Vic., C. 76, Section 120).

It not unfrequently happens that complaints are made of nuisances arising outside the district, such nuisances as the pollution of streams, the emission of smoke or fumes from chimneys of works situated without the district. In these cases legal proceedings would have to be taken in the district in which the works or premises causing the pollution of the atmosphere or stream are situated, as provided for in this clause.

Where a nuisance under this Act within the district of a local authority appears to be wholly or partially caused by some Act or default committed or taking place without their district, the local authority may take or cause to be taken against any person in respect

of such act or default any proceedings in relation to nuisances by this Act authorised, with the same incidents and consequences, as if such act or default were committed or took place wholly within their district; so, however, that summary proceedings shall in no case be taken otherwise than before a court having jurisdiction in the district where the act or default is alleged to be committed or take place (38 & 39 Vic., C. 55, Section 108).

The words of this section are similar to 54-55 Vic., C. 76, Section 14, except that the term "sanitary authority" is used for that of "local authority."

SERVICE OF NOTICES, AND LEGAL PROCEEDINGS.

It is by no means necessary or desirable that in every case of a nuisance brought under the cognizance of the inspector, the law should be threatened or invoked. I find, from considerable experience, that if a "preliminary notice or intimation" is sent to the person causing the nuisance, that the works required to be done are carried out and the nuisance abated without the necessity of serving a formal notice, thus avoiding unpleasantness with the owners of property and saving much valuable time of the Sanitary Authority. I have ventured to append two forms of such notices which I have been accustomed to use, in the hope that they may be of service to others who have not yet adopted such a course of procedure.

Sanitary Department.

Office Hours: 9 to 10 A.M., and 5 to 5.30 P.M.

To

of

I, the undersigned, Inspector of Nuisances to the Corporation of DO HEREBY GIVE YOU NOTICE of the existence of a Nuisance at

arising from

And I am instructed by the Corporation to call upon you to abate the same within days from the service of this Notice, and for that purpose

I am also directed to inform you that if you make default in complying with the requisitions of this Notice, or if the Nuisance, though abated, is likely to recur, the Corporation will put in force all the powers which they possess to compel you at once to abate it and restrain you from again permitting it.

Dated this *day of* 189

SANITARY DEPARTMENT.

IN ATTENDANCE DAILY, 9 TO 10 A.M. AND 4 TO 5 P.M.
SATURDAYS 9 TO 10 A.M. ONLY.

PUBLIC HEALTH (LONDON) ACT, 1891.

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SIR (or MADAM),

I beg to inform you of the existence of a nuisance at and shall be glad if you will cause the undermentioned works to be executed within days, and for that purpose to

Yours faithfully

Chief Sanitary Inspector.

To

NOTE.—Any further information respecting the work required by this notice may be obtained upon application to the Sanitary Inspector. Notice must be given to the Inspector when commencing this work. No drains are to be covered before inspection.

Great care must be taken by the inspector to avoid too much toleration in the carrying out of sanitary reforms, as there are a certain class of persons who will not move unless absolutely compelled. With these it will be essential that he should deal promptly and decisively, reporting such cases to the Sanitary Authority upon the expiration of the time allowed in the preliminary notice, asking for "their" instructions and

authority to serve the "statutory" notice with power to institute legal proceedings in the event of such notice not being complied with.

In the service of the formal and other notices the inspector must make himself master of the following clauses so as to avoid any technicalities being raised should legal proceedings be instituted:—

Notices, orders and other such documents under this Act may be in *writing* or *print*, or *partly in writing* and *partly in print;* and if the same require authentication by the local authority, the signature thereof by the clerk to the local authority or their surveyor or inspector of nuisances shall be sufficient authentication (38 & 39 Vic., C. 55, Section 266; also 54 and 55 Vic., C. 76, Section 127).

Notices, orders, and any other documents required or authorised to be served under this Act may be served by *delivering the same to or at the residence* of the person to whom they are respectively addressed, or where addressed to the owner or occupier of premises by delivering the same or a true copy thereof to some person *on the premises*, or if there is no person on the premises who can be so served by *fixing the same on some conspicuous part of the premises;* they may also be served by post by a *prepaid letter*, and if served by post shall be deemed to have been served at the time when the letter containing the same would be delivered in the ordinary course of post, and in proving such service it shall be sufficient to prove that the notice order or other document was properly addressed and put into the post.

Any notice by this Act required to be given to the owner or occupier of any premises may be addressed by the description of the "owner" or "occupier" of the premises (naming them) in respect of which the notice is given, without further name or description (38 & 39 Vic., C. 55, Section 267; also 54 & 55 Vic., C. 76, Section 128).

It is also essential that in order to observe the rule for the proper service of the notices and the taking of proceedings, he should be acquainted with the following interpretations:—

"Owner" means the person for the time being receiving the rack-rent of the lands or premises in connexion with which the word is used, whether on his own account or as agent or trustee for any other person, or who would so receive the same if such lands or premises were let at a rack-rent.

"Rack-rent" means rent which is not less than two-thirds of the full net annual value of the property out of which the rent arises; and the full net annual value shall be taken to be the rent at which the property might reasonably be expected to let from year to year, free from all usual tenant's rates and taxes, and tithe commutation rentcharge (if any), and deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses (if any) necessary to maintain the same in a state to command such rent.

The definition owner and rack-rent are similar to those given in Section 141 of the Public Health (London) Act, 1891.

"Person" includes any body of persons, whether corporate or unincorporate.

"House" includes schools, also factories and other buildings in which *more than twenty* persons are employed *at one time.*

The words in italics are omitted from the definition of "house" given in the Public Health (London) Act, 1891.

"Lands" and "Premises" include messuages, buildings, lands, easement and hereditaments of any tenure (38 & 39 Vic., C. 55, Section 4).

"Premises" includes messuages, buildings, lands, easements, and hereditaments of any tenure, whether open or enclosed, whether built on or not, and whether public or private, and whether maintained or not under statutory authority (54 & 55 Vic., C. 76, Section 141).

The expression "premises" given in the Public Health (London) Act, 1891, as above, is wider than in any previous Act.

Form of statutory notice requiring abatement of nuisances:—

To

Take notice that under the provisions of the Public Health Act, 1875, the being satisfied of the existence of a nuisance at arising from

do hereby require you within from the service of this notice to abate the same, and for that purpose to

If you make default in complying with the requisitions of this notice, or if the said nuisance, though abated, is likely to recur, a summons will be issued requiring your attendance to answer a complaint which will be made to a court of summary jurisdiction for enforcing the abatement of the nuisance, and prohibiting a recurrence thereof, and for recovering the costs and penalties that may be incurred thereby.

Dated this day of 18 .

Signature of officer of local authority

(38 & 39 Vic., C. 55).

When legal proceedings are authorised, and before the "information" is laid, the inspector must be fortified by the evidence and support of the Medical Officer of Health and such other persons as from the circumstances of the case appear to be necessary.

The Town Clerk or other legal adviser of the local authority should be consulted as to the preparation of the "information" for the summons and the evidence to be tendered. The inspector is occasionally placed in the position of the solicitor, some from choice and others from compulsion, but the conducting of legal proceedings by a sanitary inspector is altogether out of place and unreasonable, as his duties are sufficiently onerous and unpleasant without adding that which only a person properly trained and educated for the law and court procedure can efficiently perform.

Before the summons is taken out, it is advisable to

give a polite reminder to the person in default, by sending him a circular letter as follows :—

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SIR (or MADAM)

Have the goodness to comply with the Notice sent you relative to

by so doing you will prevent legal proceedings being instituted, and oblige.

Your obedient servant,

Chief Sanitary Inspector.

In the event of no notice being taken of this communication the officer must delay no longer, but at once put the legal machinery in motion.

The inspector must be able to produce, if necessary, his authority for taking legal proceedings, as provided in these clauses :—

Any local authority may appear before any court, or in any legal proceeding by *their clerk*, or by *any officer or member authorised generally or in respect of any special proceeding by resolution of such authority*, and *their clerk*, or *any officer* or member so authorised shall be at liberty to institute and carry on any proceeding which the local authority is authorised to institute and carry on under this Act (38 & 39 Vic., C. 55, Section 259; and 54 & 55 Vic., C. 76, Section 123).

As the inspector is supported by the law for his course of action, it is important that he should not be vindictive, but state the truth without exaggerating the offence or giving the court the idea that he is anxious to secure a conviction. Such conduct on the part of public officials shows exceeding bad taste and if dis-

covered will tend rather to assist the defendant than the inspector, and will eventually bring disgrace upon sanitary officers and their work. The sanitary inspector is protected from liability in carrying out his duties by the following clauses :—

No matter or thing done, and no contract entered into by any local authority or joint board or port sanitary authority, and no matter or thing done by any member of any such authority or by any officer of such authority or other person whomsoever acting under the direction of such authority, shall, if the matter or thing were done, or the contract were entered into bonâ fide for the purpose of executing this Act, subject them or any of them *personally* to any action, liability, claim, or demand whatsoever ; and any expense incurred by any such authority, member, officer, or other person acting as last aforesaid shall be borne and repaid out of the fund or rate applicable by such authority to the general purposes of this Act (38 & 39 Vic., C. 55, Section 255 ; also 54 & 55 Vic., C. 76, Section 124).

In the matter of book-keeping and correspondence, the inspector cannot be too careful and methodical. His reports should as far as possible be in writing so as to avoid misunderstanding as to what his advice is upon any subject.

His books should be regularly posted and all letters and other communications, after acknowledgement, put carefully away, but any matter of correspondence which he may have for the Committee's consideration, should be placed together and be in readiness for the next meeting, this will save him much annoyance and worry at the last moment before the meeting, in endeavouring to find the papers he requires.

The books in his possession should be specially adapted for his work, and so arranged, when properly kept, as to furnish a complete and continuous record of

the work carried out in his department, but too much clerical work is not desirable and he will be wise to avoid all unnecessary labour in this direction.

In addition to the usual office stationery and the various "forms" and "notices," &c., it is indispensable that the inspector should have all or some of the following books, but this will depend upon the peculiarities of his duties and the special requirements of his district:—

Office diary.
Press letter book.
Pocket-book (ordinary).
Register of letters received.
Complaint book.
Report book (committee).
Report book (in which all inspections relating to nuisances are entered).
Sanitary inspector's weekly summary.
Register of slaughter houses, ,, bakehouses, ,, offensive trades } These may form one register.
,, common lodging houses.
,, houses let in lodgings.
,, infectious diseases and disinfection.
,, canal boats.
Examining officer's report of canal boats.
Register of cowsheds, dairies and milkshops.
Disinfecting station keeper's receipt book of articles received.
Smoke nuisances report book.
Sale of food and drugs act report book, and
Ashpit or dust removal register.

The preparation of the inspector's annual report, if not regularly kept in the form of a weekly, fortnightly,

or monthly summary, becomes a very tedious task at the end of the year to formulate the information necessary to make the report anything like complete in the limited time at the disposal of the officer. I have, therefore, appended such a summary, which, generally speaking, is required, and if properly posted for the regular meetings of the Sanitary or Health Committee it will be found useful for reference should the chairman, the medical officer, or other interested person require immediate information respecting the work of the department, besides enabling the inspector to prepare the tables for his annual report with comparative ease, having simply to add up the weekly, fortnightly, or monthly totals as the case may be.

SANITARY INSPECTOR'S SUMMARY.

Week ending 189

Existing Nuisances, requiring Formal Notices for their Abatement.

Date of Report.	Folio in Report Book.	Situation of Premises where Nuisance exists.	Remarks.

Abatement of Nuisances.

Number of houses and premises inspected.
" nuisances discovered.
" re-inspections made.
" formal notices served.
, preliminary notices served.
" circular letters for non-compliance with formal notices.
" references to borough engineer (or surveyor).
" applications for dust removal or ashpit emptying.

The following is a description of the nuisances dealt with :—

Nature of Nuisance.

Number of defective or choked drains.
" defective and untrapped gullies.
" bath, sink, or other waste-pipes connected to drain or soil pipe.
" soil pipes unventilated.
" defective w.c's, pail closets, or privies.
" defective eaves-gutters, downspouts, and roofage.
" defective or unpaved yards and passages.
" houses without water supply.
" " proper drains.
" " overcrowded.
" " dirty.
" " with filthy closets.
" accumulations of offensive matter.
" nuisances from the keeping of animals (including pigeons and poultry).
" defective middensteads (or dung pits).
" nuisances from want of ventilation.
" miscellaneous nuisances.
" privies converted to the pail or water-closet system.
" drains tested.

Infectious Diseases, Etc.

Number of infectious cases reported.
" medical certificates received.
" infected houses visited.
" patients removed to the hospital.
" houses disinfected.
" rooms disinfected.
" articles of clothing, &c., disinfected.
" houses cleansed and limewashed.

Disease.	No. 1 Ward.	No. 2 Ward.	No. 3 Ward.	No. 4 Ward.	No. 5 Ward.	No. 6 Ward.	No. 7 Ward.	No. 8 Ward.	No. 9 Ward.	No. 10 Ward.	Totals.
Small-pox											
Cholera											
Diphtheria											
Membranous croup											
Erysipelas											
Scarlet fever or scarlatina											
Typhus fever											
Enteric or typhoid fever											
Relapsing fever											
Continued fever											
Puerperal fever											
Ward or district totals											

Note.—In rural districts the different "parishes" would take the place of "wards" in the table.

Common Lodging Houses.

Number of houses registered in the borough.
" lodgers registered for.
" visits by night.
" " day.
" lodgers reported as being received.

Inspection of Schools.

Number of schools examined.
" " found clean.
" " " dirty.
" " disinfected or cleaned.
" notices issued to cleanse, &c.

Canal Boats.

Number of canal boats registered at.
" applications for registrations.
" " granted.
" inspections made.
" contraventions of regulations.
" notices issued.

Markets and Slaughter-Houses.

Number of licensed slaughter houses.
" visits to ditto.
" seizures of unsound food :—

No.	Articles.	Weight, &c.
	Beef.	
	Pork.	
	Rabbits.	
	Fish.	
	Cockles.	

Bakehouses.

Number of bakehouses on register.
" visits paid to bakehouses.
" notices issued *re* limewhiting, &c.

The Dairies, Cowsheds, and Milkshops Order.

Cowsheds.

Number of cowsheds on register.
,, applications for registration as cowkeepers.
,, visits paid to cowsheds.
,, notices issued *re* limewhiting, &c.

Dairies and Milkshops.

Number of purveyors of milk and dairymen on register.
,, applications for registration as purveyors of milk or dairymen.
,, visits paid to milkshops and dairies.
,, notices issued *re* limewhiting, &c.

Assuming that many of the readers of this work are newly appointed and that there are others desirous of making improvement in the matter of book-keeping, I have deemed it necessary to add specimen headings of several of the more important office books mentioned:—

Register of Cowsheds, Dairies and Milkshops.

Date of Registration.	Name of occupier.	Situation of premises registered.	Whether registered as cow-keeper, dairyman or purveyor of milk.

Inspection Book for Cowsheds, Dairies and Milkshops.

Date of inspection 189
Situation of premises inspected

Name of occupier
Name and address of owner or agent

Particulars of premises inspected.
- No. of cows kept
- No. of cowsheds
- No. of places used for storing milk

Dimensions and cubical contents of each cowshed :—

No. 1	No. 3	No. 5
No. 2	No. 4	No. 6

Average space per head of cattle :—

Remarks as to drainage :—

Remarks as to water supply :—

Remarks as to the ventilation of the cowsheds, &c.

Superficial area of the windows (if any) in each of the cowsheds

Disinfecting Station "Keeper's" Receipt Book.

..... 189	..... 189 .....
Address	*Received of*
	of
(Counterfoil).	*the following articles, for disinfecting :—*
	Note.—This receipt to be returned when the articles for which it is an acknowledgment are given up.

Nuisance (or Sanitary) Inspector's Report Book.

No.	Date of Complaint.	Date of Visit.	Situation of the premises inspected.	Name and address of owner, agent, or occupier.	Date of Notices and number of days allowed.	Date reported to the Sanitary Committee, and their directions.

Inspector's Report.	Remarks.

Common Lodging House Register.

No. of common lodging house.	Date of registration.	Name of keeper.	Situation of house registered.	No. of bedrooms set apart for lodgers and registered.	Dimensions of each room.	Cubical contents of such rooms.	Number of lodgers allowed in each room.

Registered Common Lodging House, No.

(Weekly return of lodgers received.)

Name of keeper *Address*

No. of lodgers for the week ending.	Males of full age.	Females of full age.	Males exceeding 10 and under 21 years.	Females exceeding 10 and under 21 years.	Males under 10 years.	Females under 10 years.	Total.	No. of lodgers allowed.

Register of Letters Received.

No. of communication.	Date received.	Who from.	Subject.

Nuisance Complaint Book.

No. of inspection.	Date of complaint.	Date of inspection.	Name and address of complainant.	Situation of premises to be inspected.	Nature of complaint.	Folio in inspector's report book.	Remarks.

Return of Cases of Infectious Disease for the Week ending 189

Address.	Sex.	Age.	Disease.	Where isolated.	Remarks.

HOUSE DRAINAGE.

It will be quite unnecessary for me to remind the Sanitary Inspector of the many evils consequent upon the imperfect drainage of houses, these being generally recognised, as most of his work springs from this cause, and, therefore, it will be his duty to see that every attention is given to this department of his labours while such works are in progress, otherwise repeated complaints will be made of nuisances arising out of bad workmanship. It is a question for consideration whether all work of this description, of old or new property, should not be carried out under the supervision and direction of the Sanitary Inspector, as under such arrangements greater care would be exercised than is usually the case when drains are being newly constructed, and this would often prevent complaints being made immediately the houses become occupied.

The Inspector should make himself thoroughly conversant with the proper principles of good house drainage, and thus be in a position to discern and point out faulty construction in the simple as well as the most complicated system of drainage, whether it be for a cottage in the country or a West End mansion.

His "key-note" should be always to remember, that work of this kind, to be efficient, depends upon two things. Firstly, the immediate and complete removal of all foul matter directly it is produced, and secondly, to prevent a return of foul gas from the drain into the house.

Drains are legally defined, as follows :—

"Drain" means any drain of, and used for the drainage of one building only, or premises within the same curtilage, and made

merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed (38 & 39 Vic., c. 55, Section 4).

For the purposes of Section 19 of the Public Health Acts Amendment Act, 1890, the expression "drain" includes a drain used for the drainage of more than one building.

There is no interpretation of the word "drain" in the Public Health (London) Act, 1891, but for the Metropolis, the definition given in the Metropolis Local Management Act, 1855, Section 250, will apply, as follows :—

"'Drain' shall mean and include any drain of, and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed and shall also include any drain for draining any group or block of houses by a combined operation under the order of any vestry or district board."

In dealing with the question of house-drainage, I purpose, first, to consider the materials of which house-drains should be made, as follows :—

(1) Glazed (socketed) stoneware pipes.

(2) Cast-iron (socketed) pipes.

Drains constructed of glazed stoneware pipes are undoubtedly the "cleanest," and have the advantage of being "non-corrosive."

The cast-iron drain-pipes have, as it appears to me, three advantages over stoneware pipes, viz. :—greater strength ; they can be made much longer, and so reduce the number of joints ; and the joint (lead) is no doubt superior to one made of cement.

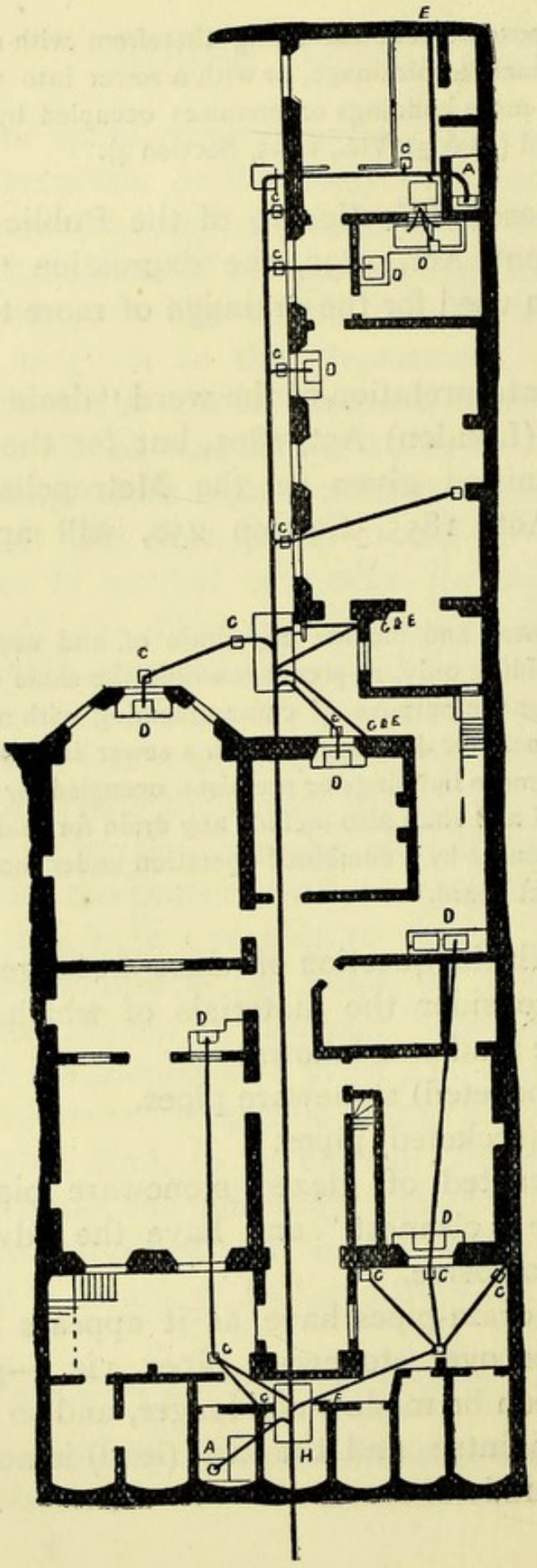


FIG. 1.—Basement plan of a town mansion, showing the method of laying the drains.

A. Water Closets. B. Rain Water Pipes. C. Sinks to Yards and Areas. D. Sinks to Kitchens and Wash-houses. E. Ventilating Pipes. F. Fresh-air Inlet. G. Soil Pipes. H. Syphons.

The question of strength may be safely dismissed, as there is very little strain upon pipes used solely for conveying sewage, and should it be necessary to carry stoneware pipes under walls, &c., precautions can be taken by throwing a relieving arch over the pipes to prevent fracture.

The points to be considered, in addition to what I have already stated, in adopting cast-iron pipes are, first, the means available for preserving them from corrosion; second, the capacity and weight of pipes.

First, the life of cast-iron drain-pipes in regard to corrosion from the outside inwards, may be gauged by the experience of gas and water engineers, as when there is oxide of iron in the soil, through which they are laid, the destruction of the pipes, from exterior rusting, is so slow as to justify their use, without any special means of protection.

In the case of drain-pipes, the exclusion of a good protecting medium, because it is poisonous, is not necessary, as is the case with water-pipes. There are two preparations specially recommended for protecting iron from oxidation, viz.:—the late Dr. Angus Smith's composition, and the Bower-Barff process.

The preparation of tar suggested by the late Dr. Angus Smith should be heated to a temperature of 400° F. before application; great care must be taken in dealing with this material to ensure a proper consistency when cooled. If subjected for some time to the necessary temperature, evaporation makes the residual hard and brittle after cooling. To avoid this, a barrel of oil should be kept at hand to mix with the composition to keep it in its original proportions; if too much oil be added the coating will not be hard enough. It is best to dip the pipes vertically.

The Bower-Barff process consists of coating the surfaces of the iron with magnetic oxide. This plan, when the surfaces of the iron are so exposed as to be capable of thorough cleansing, gives excellent results. The interior of the pipes require special care in this respect owing to the rough particles of sand left behind, which, at the high temperature required for the production of the magnetic oxide, will form vitreous glazing, unless the pipes are well cleaned beforehand.

The internal diameter of cast-iron pipes generally used, is 5 inches and they are $\frac{5}{16}$ inch in thickness. The weight of a 6 feet length of pipe of this dimension would be about 100 lbs. It is usual, however, to fix pipes in 9 feet lengths.

The circumstances are very exceptional when glazed stone-ware pipes cannot be used; and it may be taken for granted, that when they are properly laid and will stand the hydraulic or water test, they will be found equal, if not superior, to the cast-iron pipes, as the latter, however well treated with anti-corrosive material, are sure to be acted upon from some cause and become a nuisance.

The stoneware drain-pipes should in no case be "less" than 4 inches or "greater" than 6 inches internal diameter; every pipe should be well burnt, glazed and socketed, circular, perfectly true in bore and straight, free from flaws, blisters, cracks or other defects.

The regulations of the New York Board of Health, U.S.A., provide that earthenware drain-pipes used in connection with dwellings shall be hard and salt glazed, sound and cylindrical, at least $\frac{5}{8}$ of an inch thick if 5 inches in diameter, and $\frac{3}{4}$ of an inch thick if 6 inches in diameter.

Pipes that are salt glazed are more durable and pre-

ferable to those lead or glass glazed; salt glaze permeates the whole body of the material while other glazes are merely superficial and often hide the defects of worthless material.

The following table as to the relative thicknesses of stoneware and fire-clay pipes is taken by permission from Baldwin Latham's *Sanitary Engineering* :—

Stoneware. Messrs. Henry Doulton & Co., Lambeth.					Fire-Clay. Messrs. Ingham & Sons, Wortley.				
Internal diameter.	Thickness.	Length in work.	Depth of socket.	Weight of foot.	Internal diameter.	Thickness.	Length in work.	Depth of socket.	Weight of foot.
inches.	inches.	feet.	inches.	lbs.	inches.	inches.	ft. ins.	inches.	lbs. ozs.
3	$\frac{1}{2}$	2	$1\frac{1}{2}$	6	3	$\frac{5}{8}$	2 0	$1\frac{1}{2}$	6 4
4	$\frac{5}{8}$	2	$1\frac{1}{2}$	9	4	$\frac{11}{16}$	2 0	$1\frac{1}{2}$	8 12
6	$\frac{11}{16}$	2	$1\frac{3}{4}$	$14\frac{1}{2}$	6	$\frac{3}{4}$	2 0	$1\frac{1}{2}$	13 8
9	$\frac{13}{16}$	2	2	28	9	$\frac{3}{4}$	2 0	$1\frac{5}{8}$	21 4
10	$\frac{7}{8}$	2	2	29	10	$\frac{13}{16}$	2 0	$1\frac{5}{8}$	24 4
12	1	2	2	46	12	$1\frac{1}{8}$	2 6	2	41 10
15	$1\frac{1}{4}$	2 to 3	$2\frac{1}{4}$	72	15	$1\frac{1}{4}$	2 6	2	61 2
18	$1\frac{3}{8}$	2 to 3	$2\frac{1}{2}$	91	18	$1\frac{3}{8}$	2 6	$2\frac{1}{4}$	83 2

The inspector should observe the undermentioned rules in carrying out drainage work, as follows:—

(1) That all drains should be laid out in straight lines with true gradients from chamber to chamber as shown in fig. 1. The disconnecting and inspection chambers should be provided at convenient points of the system in order to receive the various branches, as shown in figs. 1 and 2.

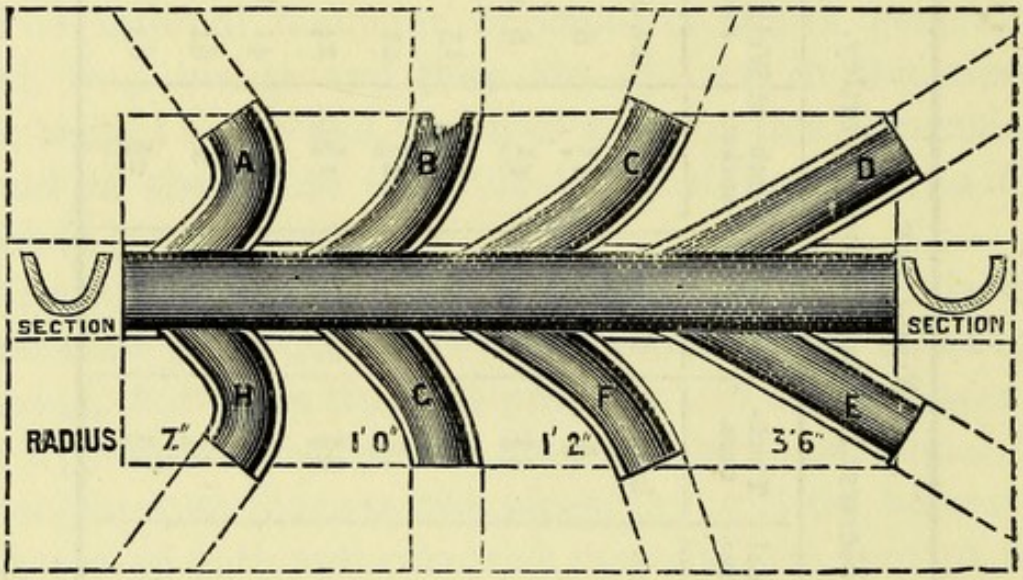


FIG. 2.—Plan of a disconnecting or inspection chamber.

(2) The connection of house drains with the sewer or branch pipes of a drain should be made with great care so as to permit of the delivery of the sewage in such a manner as not to impede the sewage in its flow as shown in fig. 3. Square or T junctions should not be used for this purpose, and it is important that pipes of equal diameter should not join with level inverts; larger pipes should not join on to smaller, but, when diminishing is necessary, the smaller pipes should join pipes of greater diameter by means of suitable taper pipes as illustrated in fig. 4, otherwise defects similar to those shown in fig. 5 will result.

(3) Drains should not pass direct from the sewers to the inside of houses. All drains should end outside the house, but when from absolute necessity the drain must be laid through the house, the pipes should have

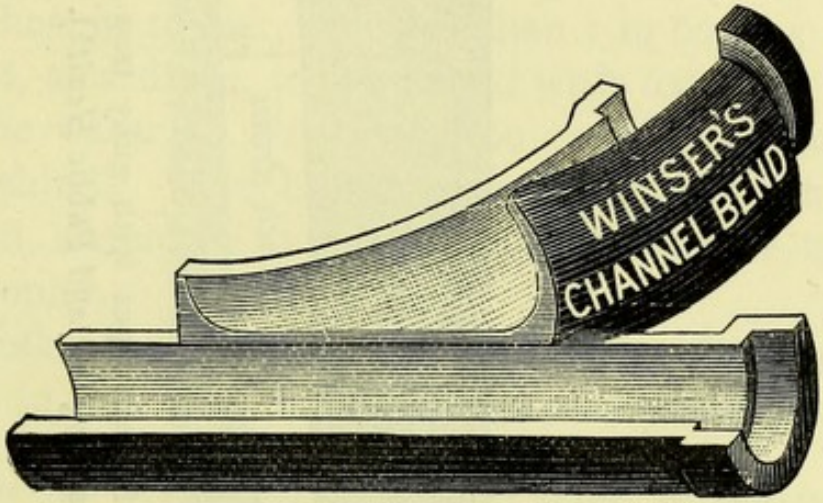


FIG. 3.—Straight channel with bend specially adapted for concentrating the sewage as it rises in passing round the bend, and in the direction of the stream.

an effectual joint of Portland cement and be bedded in and around with concrete at least 6 inches in thickness. All drains should be ventilated their whole sectional diameter, back and front, outside the house.

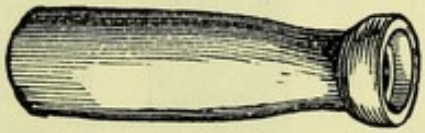


FIG. 4.—Taper pipe.

The Local Government Board (Model Bye-Laws) provides that there shall be on the line of each drain, "*two untrapped openings*," one opening being on the house side of the disconnecting trap, and the second at the summit of the drain, that is, the soil pipe, if there be one.

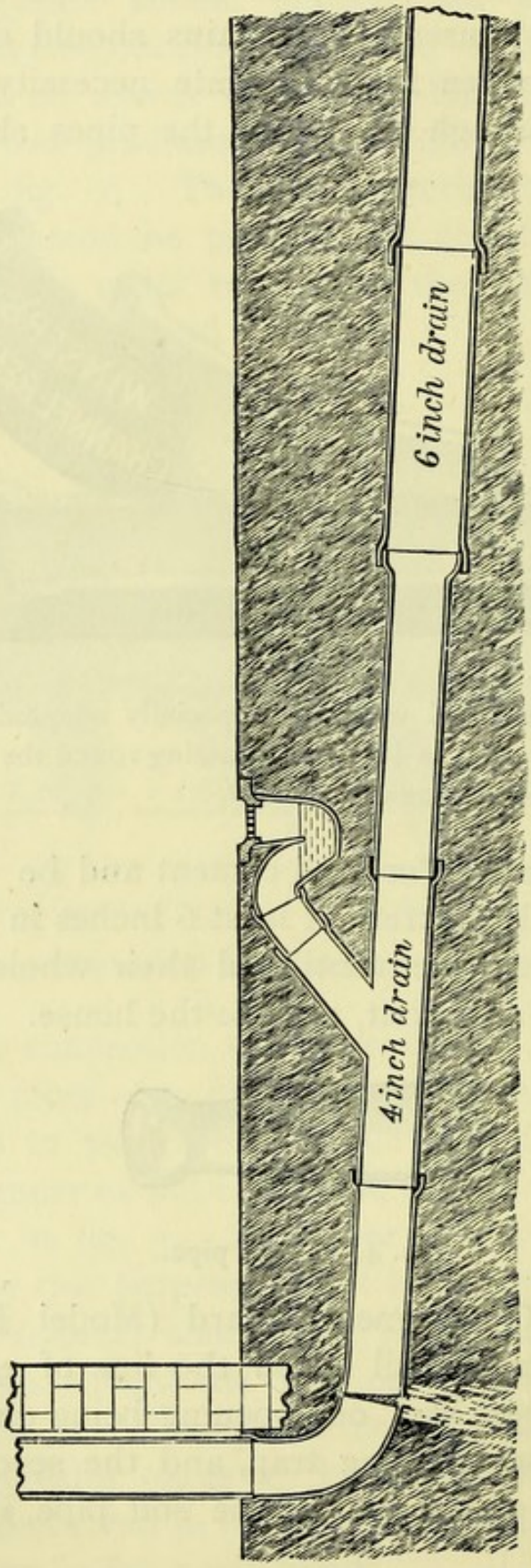


FIG. 5.—Showing defects in the connection and diminishing of drain-pipes with gully trap connected to drain contrary to flow of stream. (From L. Parkes' *Hygiene and Public Health*).

(4) The gradient of a drain must be regulated according to the depth of the sewer to be entered, the length of the drain to be laid, and the depth of the lowest floor level of the premises to be drained. The inclination, however, should not be greater than 1 in 40 or 3 inches in 10 feet, nor less than 1 in 60 or 3 inches in 15 feet, as a drain, which is laid with too great a fall, allows the water to flow away too rapidly, leaving the solids behind. The highest point of the drain-pipes when laid, should be at least two feet below the surface of the ground.

The following table of velocity given by Baldwin Latham, in his *Sanitary Engineering*, may prove useful.

Velocity in feet per minute in circular sewers or drains when running full or half-full at various rates of inclination.

Rate of Inclination.	Pipes 4 inches diameter.	Pipes 6 inches diameter.	Pipes 9 inches diameter.	Pipes 12 inches diameter.	Pipes 15 inches diameter.	Pipes 18 inches diameter.
1 in 30	322	395	481	551	611	664
,, 35	298	366	446	513	569	619
,, 40	278	342	418	481	535	582
,, 45	261	322	395	454	506	551
,, 50	246	307	375	432	481	525
,, 60	226	279	343	395	440	481
,, 70	209	257	317	366	408	446
,, 80	194	239	296	342	382	418
,, 90	182	225	279	322	360	394
,, 100	172	213	264	306	342	374
,, 110	163	202	251	291	326	357
,, 120	155	193	240	278	312	342

It sometimes happens that the gradient obtainable for a drain is not sufficient, or in other words the velocity of flow, owing to the flat state of the drain, is insufficient to prevent deposit of sedimentary matter in the system of drains. Hence it becomes important

that arrangements should be made for flushing the drains in order to keep them thoroughly cleansed, and

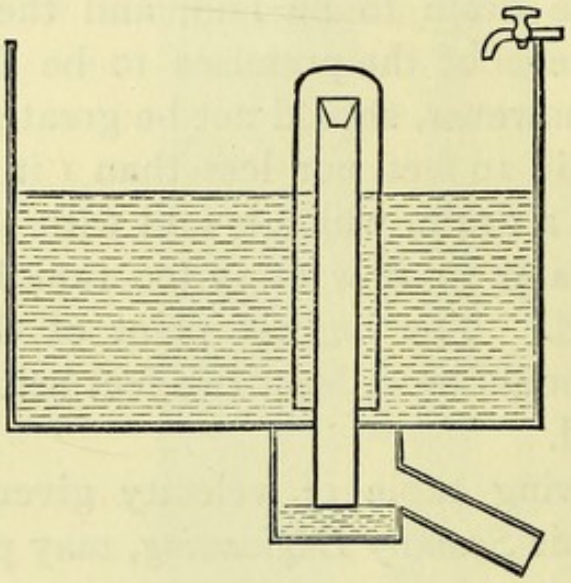


FIG. 6.—Field's flushing tank (L. Parkes' *Hygiene*).

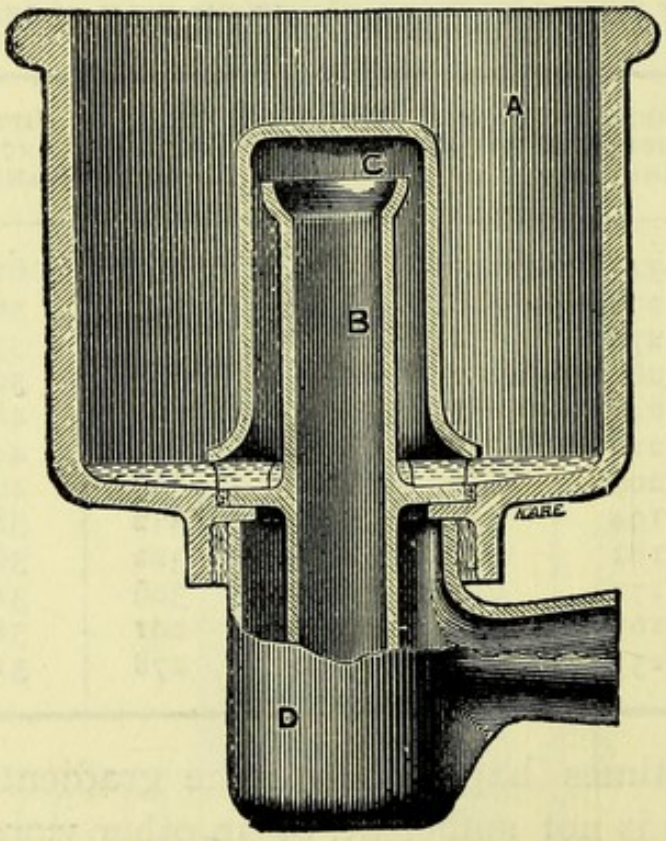


FIG. 7.—Bolding's stoneware flushing tank.

in efficient working order. For flushing the drains, tanks or cisterns (similar to figs. 6 and 7) are usually

provided, the contents of which are periodically discharged by means of a self-acting syphon and by tumbler or tilting arrangements.

The capacity of the flushing tanks or cisterns will vary according to the length and diameter of the drain to be flushed, but generally speaking a tank having the capacity of 30 to 50 gallons of water, and discharged with great freedom once or twice in every twenty-four hours, will serve to keep the drains of a moderately sized house satisfactorily cleansed.

As house drains should not communicate directly with the sewer, and as the old method of placing a syphon trap (fig. 8) without any means of ventilation does not

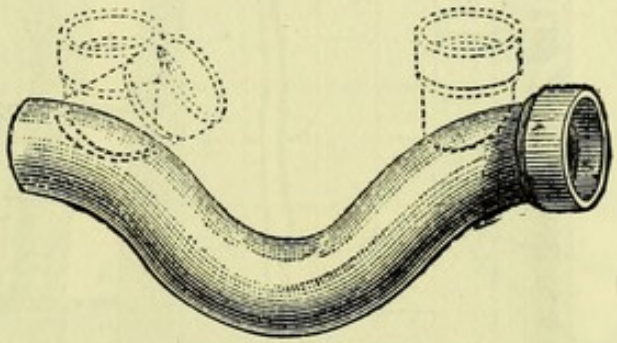


FIG. 8.—Ordinary syphon trap, with dotted lines showing how it may be ventilated.

conform to this rule, as sewer gas under certain conditions is known to pass through the water seal of the traps, various kinds of intercepting or disconnecting traps with means of ventilation have been invented.

Those traps holding a large body of water or those having their inlets at the same level as the outlets should not be fixed, as they both offer great resistance to a thorough cleansing of the trap, and to avoid stoppage from this cause it is advisable to use a 4-inch trap for a 6-inch drain, and diminish as shown in fig. 13.

The practice of constructing disconnecting chambers, as shown in figs. 9 and 10 at the nearest point of the

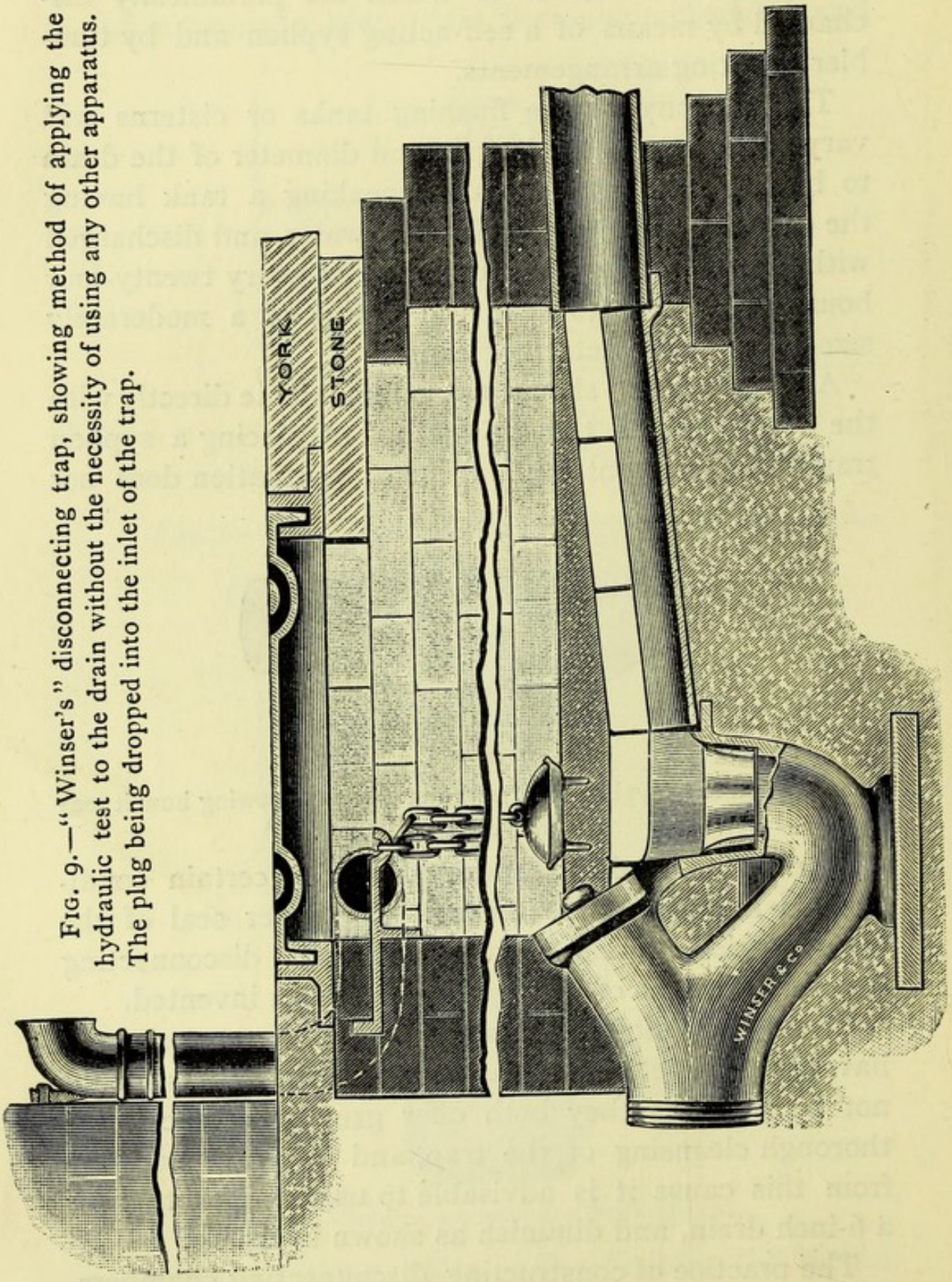


FIG. 9.—"Winser's" disconnecting trap, showing method of applying the hydraulic test to the drain without the necessity of using any other apparatus. The plug being dropped into the inlet of the trap.

sewer of suitable dimensions, say 2 feet × 3 feet with depth according to circumstances, having cement or glazed brick sides, open channel inverts, fresh air inlet with

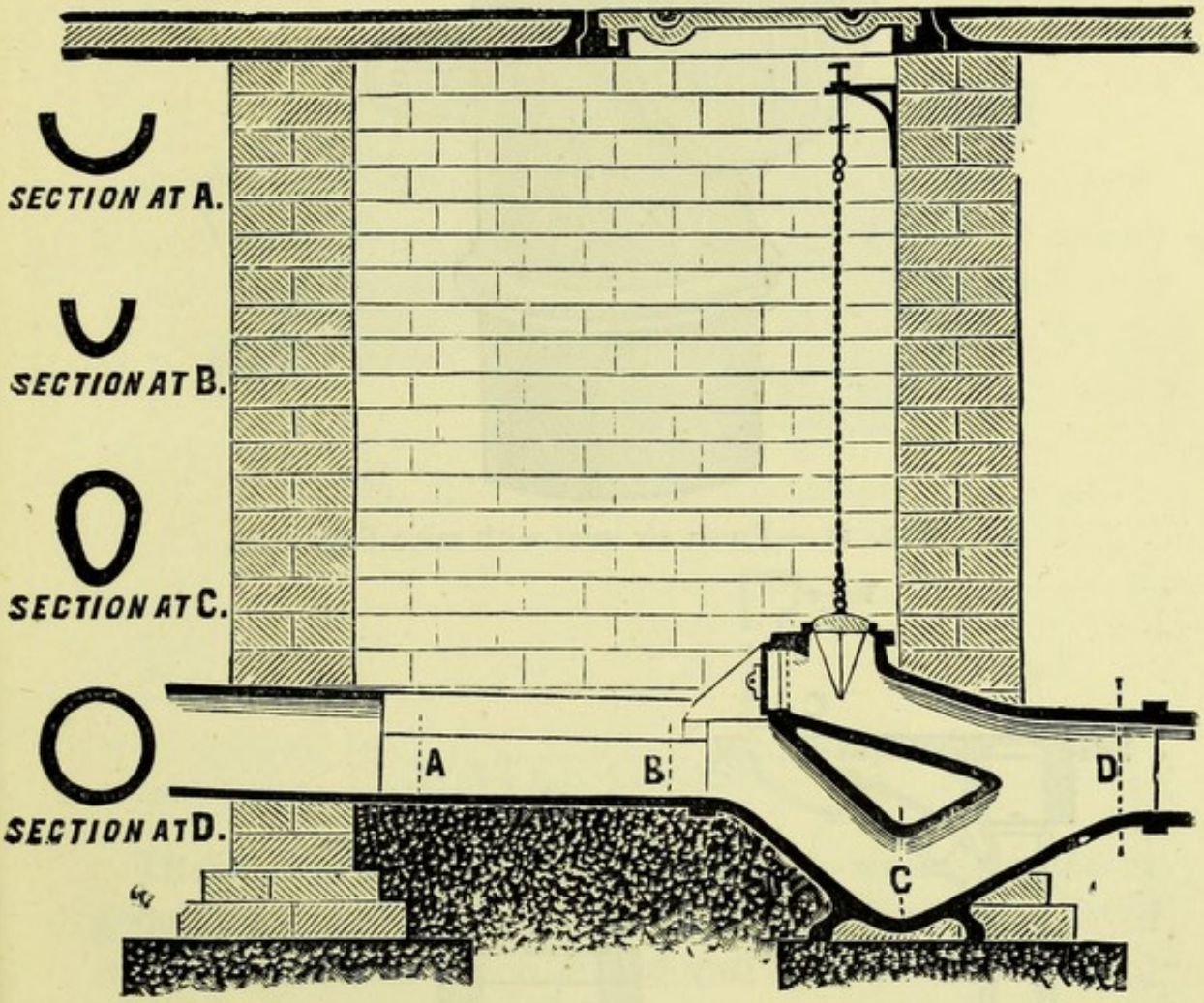


FIG. 10.—Crapper's Improved Kenon Trap.

Specially adapted for deep chambers, as should the trap become emporarily stopped the contents of the chamber may be discharged by the raising valve on the raking arm.

mica-flap, fig. 11, and air tight cover, affords facilities for inspection, testing, ventilation and cleaning that the methods shown in figs. 12 and 13 do not.

The air tight chamber covers should not be hinged or screwed, but simply dropped in a groove and made to

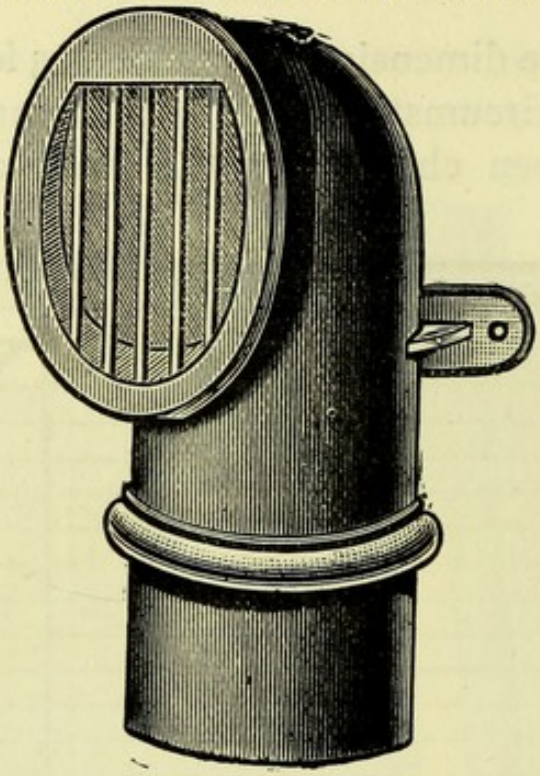
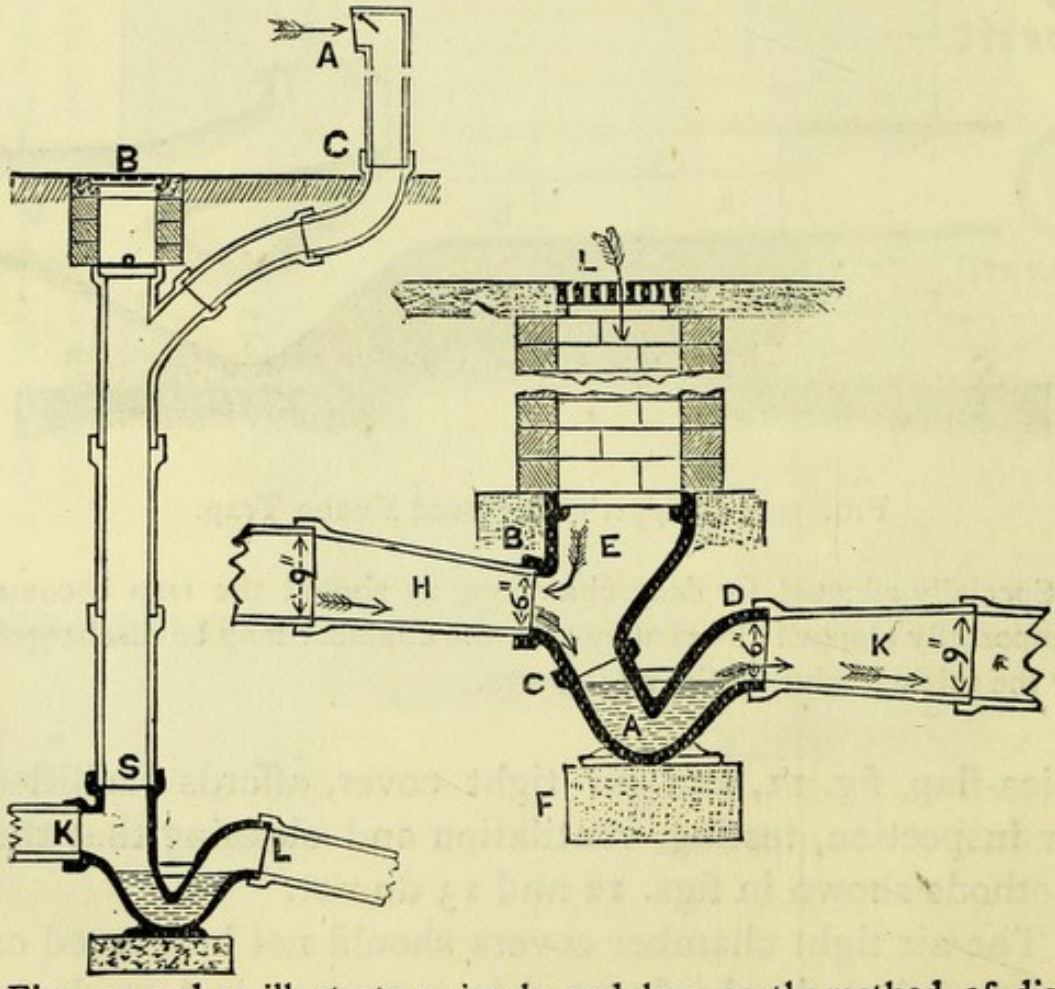


FIG. 11.—Fresh air inlet with mica-flap.



Figs. 12 and 13 illustrate a simple and less costly method of disconnecting and ventilating house drains, Dent and Hellyer's traps being used.

lift, as shown in fig. 14, the groove being filled with Russian tallow mixed with oil which renders the cover perfectly air tight, and the material does not evaporate so quickly as water.

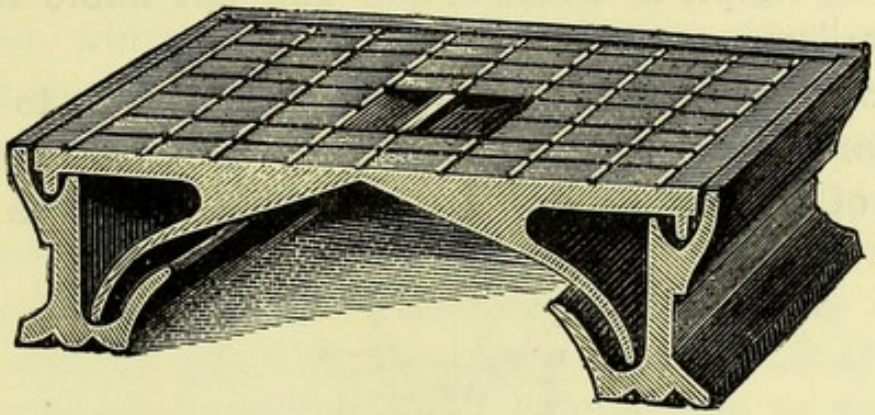


FIG. 14.—Section of chamber cover.

WATER-CLOSETS.

There can be no doubt that many water-closets in general use are extremely defective in the principle of construction, and when introduced into a house instead of being a comfort and a luxury are a positive nuisance, and often endanger the lives of persons exposed to their influence. Most of the complaints raised against the water carriage system have been directed solely against the water-closet, as being the source of nuisance when introduced within a house. These complaints are, without doubt, in many instances well founded, but the remedy is not to abandon the water carriage system, but to correct the defects in the form of closet which have given rise to these complaints.

A detailed description of the different kinds of water-

closets in use is unnecessary. Suffice it to say, that the essential qualities of a good water-closet are:—first, that it shall be inodorous; second, it must work efficiently with a minimum quantity of water; third, it should be simple in construction and not liable to get out of order.

A good water-closet will allow all matters to be at once conveyed away, and will thus cease to have the power of producing evil, so far as the house is con-

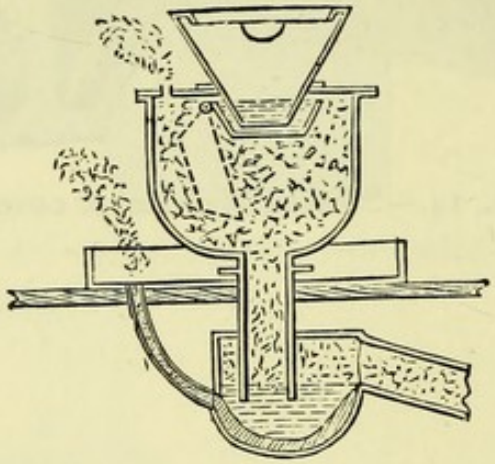


FIG. 15.—The "pan closet" and D-trap, showing how it becomes foul, &c. (Corfield's *Dwelling Houses*).

cerned. Those systems which conserve fæcal deposits within, or in close proximity to, the house, such as the privy, pail, or earth closets, admit of the danger incurred in storing any dangerous matter, however carefully we may tend and guard against its evil effects. I may observe that whatever good the "pan-closet" with its accompanying D-trap (fig. 15) may have done in its day and generation, it is now generally condemned, as with the greatest care possible it is sure to become foul and give cause for complaint. The pan closet may be divided into four parts:—the basin, pan, container or trunk, and the trap which is usually the old lead D-trap.

The "container" or "receiver," the material being iron, and the "form of trap" used are the parts which become foul, besides which, the space between the pan and the level of water in the trap may be said to be air-locked, and, consequently, when the pan is lowered, the foul air, which the space in question contains, escapes under the nose of the person using the closet.

A pan closet has seldom, if ever, a proper and sufficient flush of water, but however much water was expended for this purpose, it could not be effectually applied so as to rid the container and the trap of soil. The method adopted for supplying pan closets with water is often another point of objection to their use, inasmuch, as the water is invariably drawn from the drinking water cistern, as illustrated in fig. 16, if the supply of water be intermittent, by means of a spindle valve and service box, which is a source of water-contamination.

Whenever the Inspector finds a pan-closet is foul, and on this account is a nuisance, it will justify him in recommending its removal, as the expense of taking the closet to pieces, cleansing and refixing, will be little less than the amount required to provide a new closet, with water waste preventer or compound flushing cistern, beside which, however often the pan-closet is cleaned, the nuisance will recur. The "valve closet," if furnished with a flush rim, is somewhat less objectionable than the pan closet, and if the overflow pipe of the basin is constructed to discharge, as shown in fig. 17, the overflow arm being open at the top, and a cap and screw at the bottom of trap, the ventilating union being fixed at the top of the overflow trap, a current of air is driven into the valve box each time the w.c. is used, which prevents syphonage and any accumulation of foul gases.

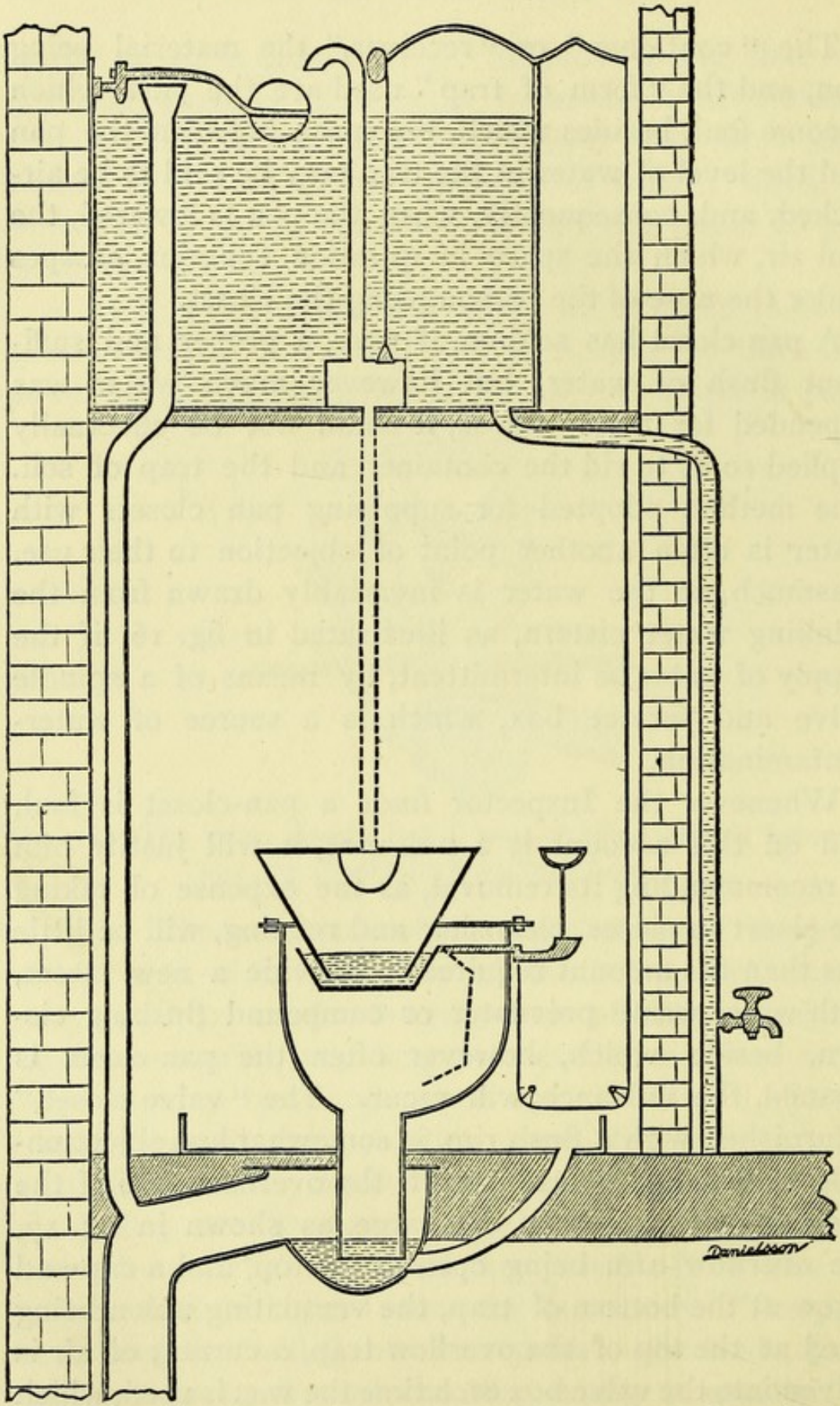


FIG. 16.—Illustrates common sanitary defects, overflow pipe of cistern used to ventilate the soil pipe, drinking water used to flush the W.C., &c. (From Louis Parkes' *Hygiene*).

The valve closet is often fixed in preference to any other form of closet, because its action is almost silent, and the flushing cistern can be dispensed with.

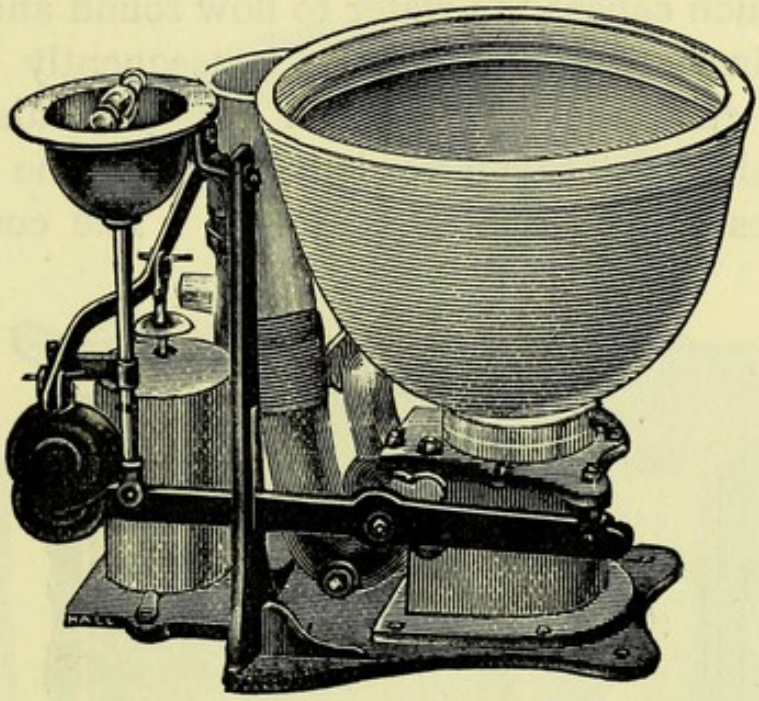


FIG. 17.—Bolding's "Cymplur" valve closet.

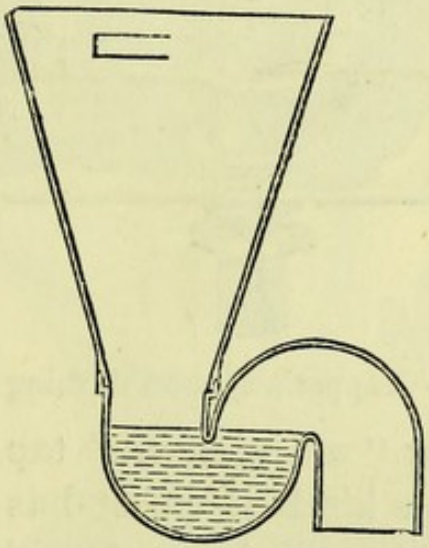


FIG. 18.—Long or tall hopper closet and trap (Parkes).

The "long" or "tall" (conical shaped) hopper closet, as shown in fig. 18, the material of which is earthenware, is an objectionable form of closet because of its shape, and the large amount of surface which is exposed

to the fæcal matter. This kind of closet frequently gives what is known as a "spiral flush," that is, the water is admitted to the hopper or basin by a "slit" in its side which causes the water to flow round and round the basin in a spiral fashion, and consequently this reduces the efficiency of the flush. They are also made with "flush rims," this latter is the best of the two, as it produces a better flush of water. The custom of

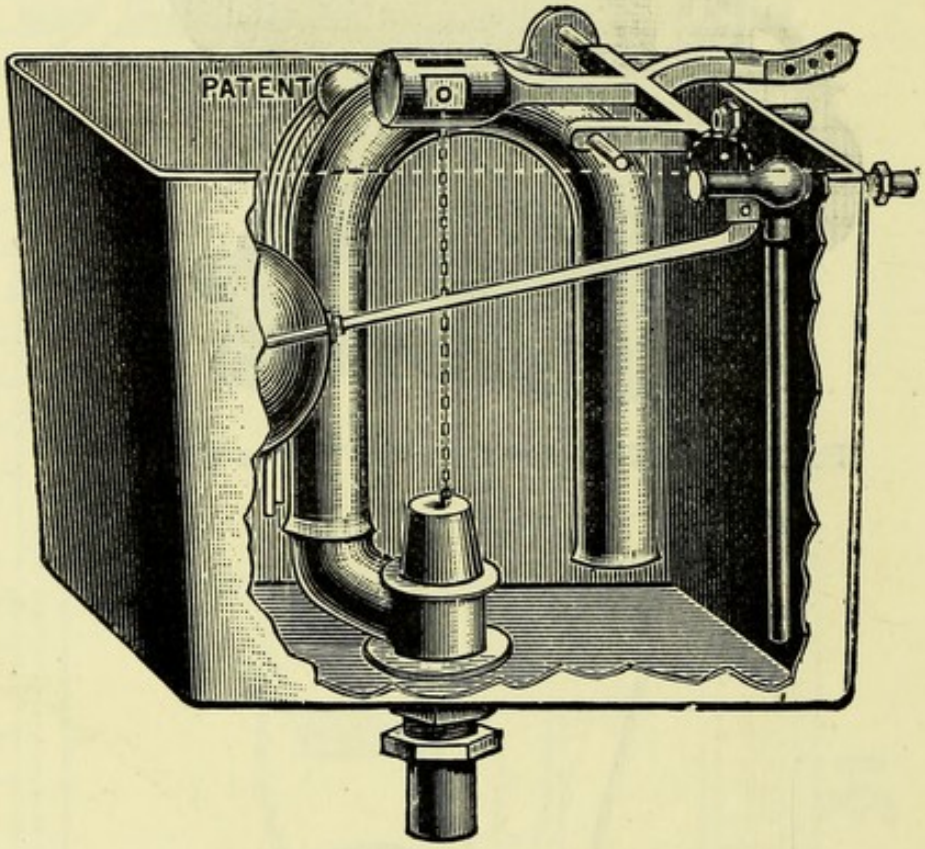


FIG. 19.—Crapper's syphon flushing cistern.

fixing a "plug" or "screw-down" tap on the seat to supply water to this kind of closet has been quite common and they may still be met with; but such an arrangement of flushing any closet is unquestionably bad, and the provision of a syphon action water-waste preventer (fig. 19), or compound double valve flushing cisterns, to discharge not less than two gallons of water at each flush, should be insisted upon.

The so-called "wash-out" closet (fig. 20) with flush rim, differs in shape and flushing arrangements to the last mentioned closet, but has the similar disadvantage

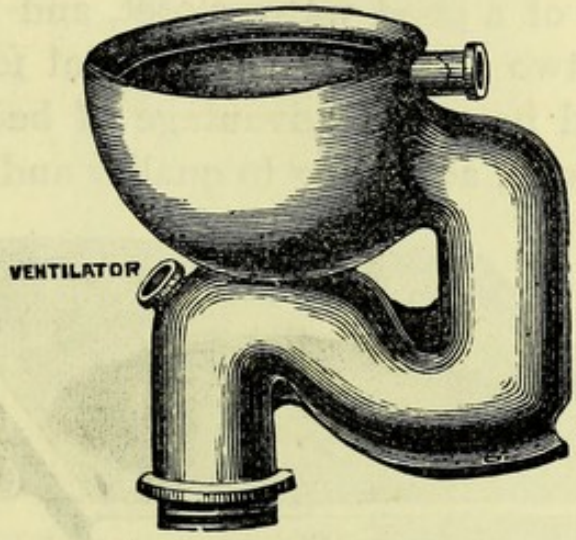


FIG. 20.—The "National" wash-out closet.

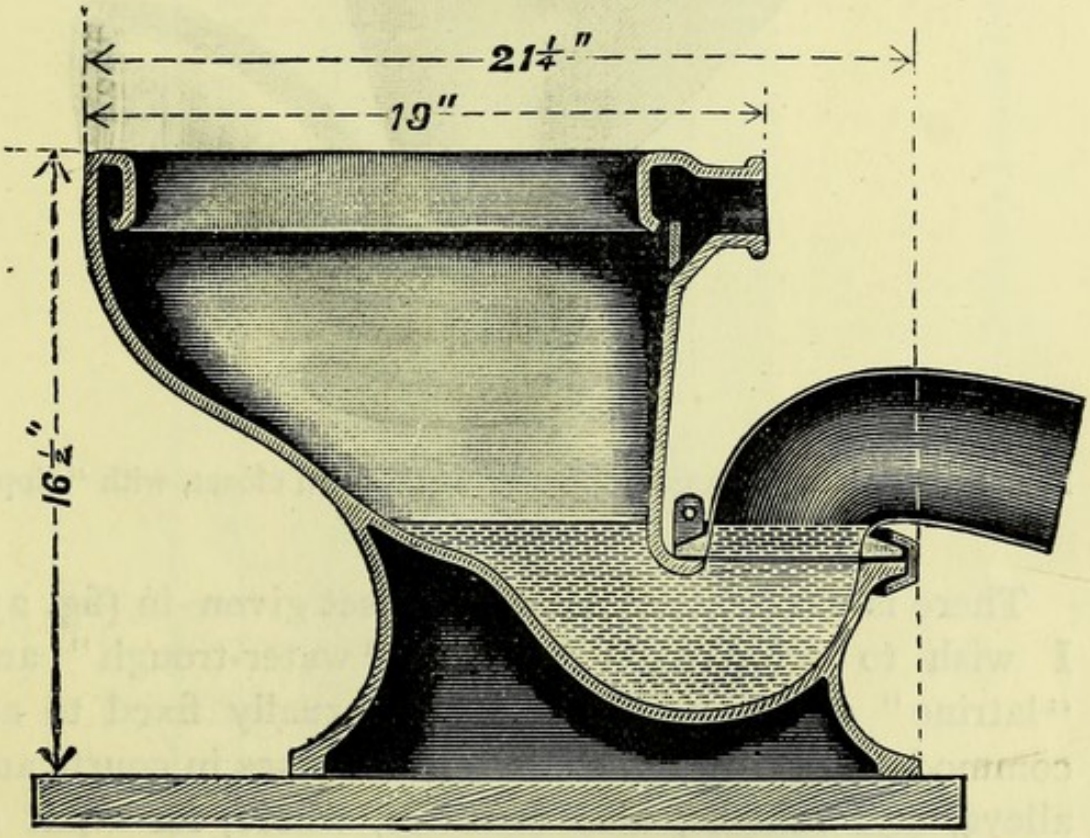


FIG. 21.—Winser's "Puro" pedestal closet with reversible lead bend and detective joint.

with regard to the amount of exposed surface, and is therefore not a clean closet.

The "short-hopper" or "wash-down" closets (figs. 21 and 22) are without question the cleanest form of closets and comply in every respect with the essential qualities of a good water-closet, and they are to be obtained in two pieces or in pedestal form, as shown in fig. 21, and have the advantage of being bought at almost any price, according to quality and finish.

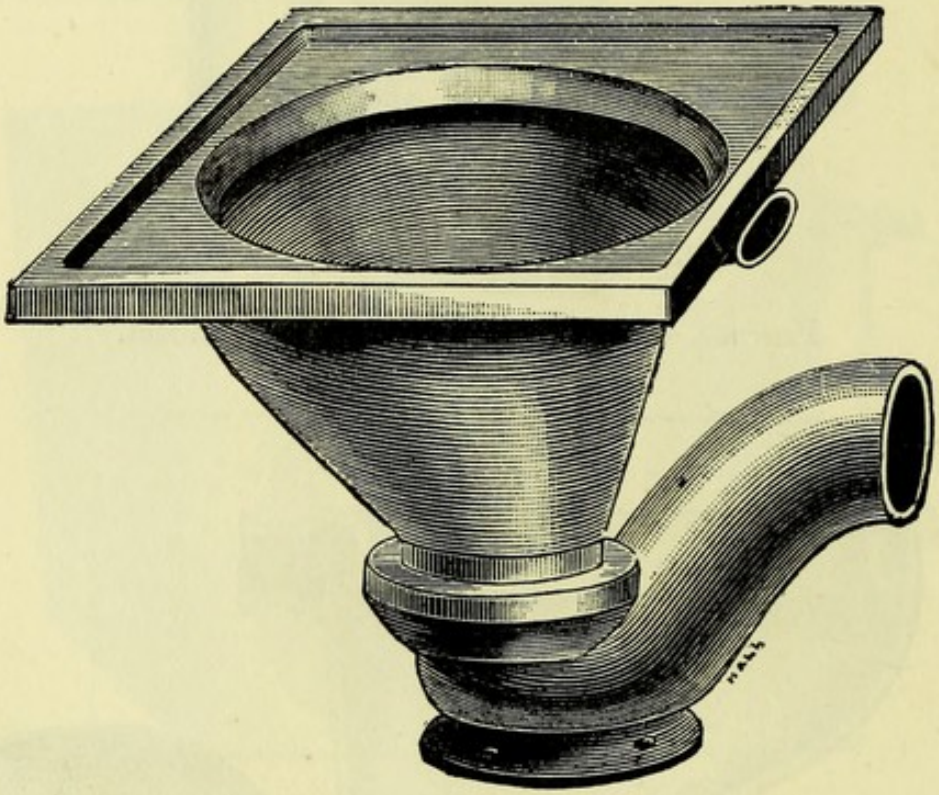


FIG. 22.—Bolding's short hopper or wash-down closet, with "slop" top.

There is yet another form of closet given in (fig. 23) I wish to refer to, viz.:—the "water-trough" and "latrine" closet. This closet is usually fixed to accommodate the occupiers of small houses in courts and alleys, and schools, also factories, where, for want of yard space and the knowledge as to the proper use of the separate water-closet, they are of great service. The materials of which these closets are made are, iron, earthenware, and brick work with cement lining, but

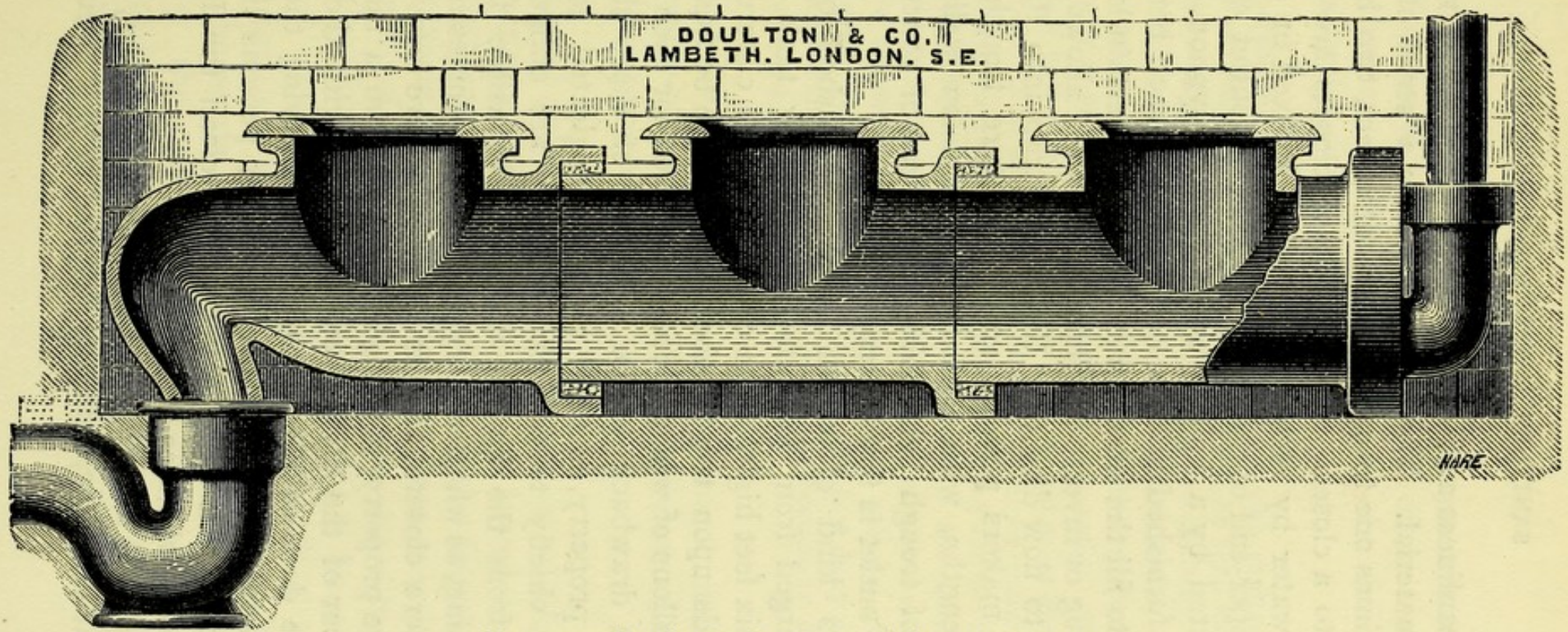


FIG. 23.—Doulton's Latrine trough water closet.

for cleanliness and durability, earthenware is much the best material. They generally form a series of closets, sometimes one to each house; at others, two houses or more to a closet. Many of these closets are supplied with water by means of a ball-cock fixed in a box at the upper-end of the line of closets, the outlet end being protected by a "plug" or an inverted syphon, the plug being furnished with a lever, the ball-cock being regulated to fill the trough with water to a certain level, and the plug or inverted syphon when raised allows the contents to flow direct or through a trap into the drain. Some makers provide an earthenware trough in two feet lengths, with sockets, and division walls; each piece of trough being laid upon a bed of concrete and at the outlet is fixed a trap.

This kind of closet is usually flushed by water discharged from an automatic flushing tank fixed at least six feet high. The capacity of the cistern or tank depends upon the number of closets to be flushed, but five gallons of water is usually allowed for each closet.

The drawback to the provision of these closets to small property, is their generally neglected condition, owing chiefly to the distance they are obliged to be fixed from the houses directly responsible for their cleansing, as what is everybody's duty becomes nobody's.

Where closets of this description are provided for cottage property, it is a good plan to have a number on the door of the closets corresponding with the number on the door of the house or houses having the use of the closet so that if the person or persons liable for their condition fails to keep them clean the Inspector will know whom to prosecute.

This will not apply to schools or factories, as there is, nearly always, someone deputed to look after them.

With respect to the cleansing of sanitary conveniences used in common by occupiers of two or more separate dwelling houses, or by other persons, the following provisions apply:—

"If any person injures or improperly fouls any such sanitary convenience, or anything used in connection therewith, he shall for every such offence be liable to a penalty not exceeding ten shillings."

"If any sanitary convenience or the approaches thereto, or the walls, floors, seats, or fittings thereof is or are in the opinion of the urban authority or of the inspector of nuisances or medical officer of health of such authority in such a state or condition as to be a nuisance or annoyance to any inhabitant of the district for want of the proper cleansing thereof, such of the persons having the use thereof in common as aforesaid as may be in default, or in the absence of proof satisfactory to the court as to which of the persons having the use thereof in common is in default, each of those persons, shall be liable to a penalty not exceeding ten shillings, and to a daily penalty not exceeding five shillings" (53 & 54 Vic., C. 59, Section 21, & 54 & 55 Vic., C. 76, Section 46).

The expression "sanitary convenience" includes urinals, water-closets, earth-closets, privies, ashpits, and any similar conveniences.

There is still another form of water-closet which has, of late, come much into use, especially in towns having but a limited supply of water or where the disposal of sewage prevents the local authorities from treating a large quantity of water consequent upon the adoption of the general form of water-closet. This is known as the "slop" water-closet, examples of which I have given in figs. 24 and 25. These are flushed by means of the waste water from the baths and sinks assisted by the rain-water. This water is discharged through the grating of a gully or otherwise, and, in turn, is emptied into a "tumbler" which when

filled discharges into the drain leading directly under the hopper or basin of the water-closet, and is said to

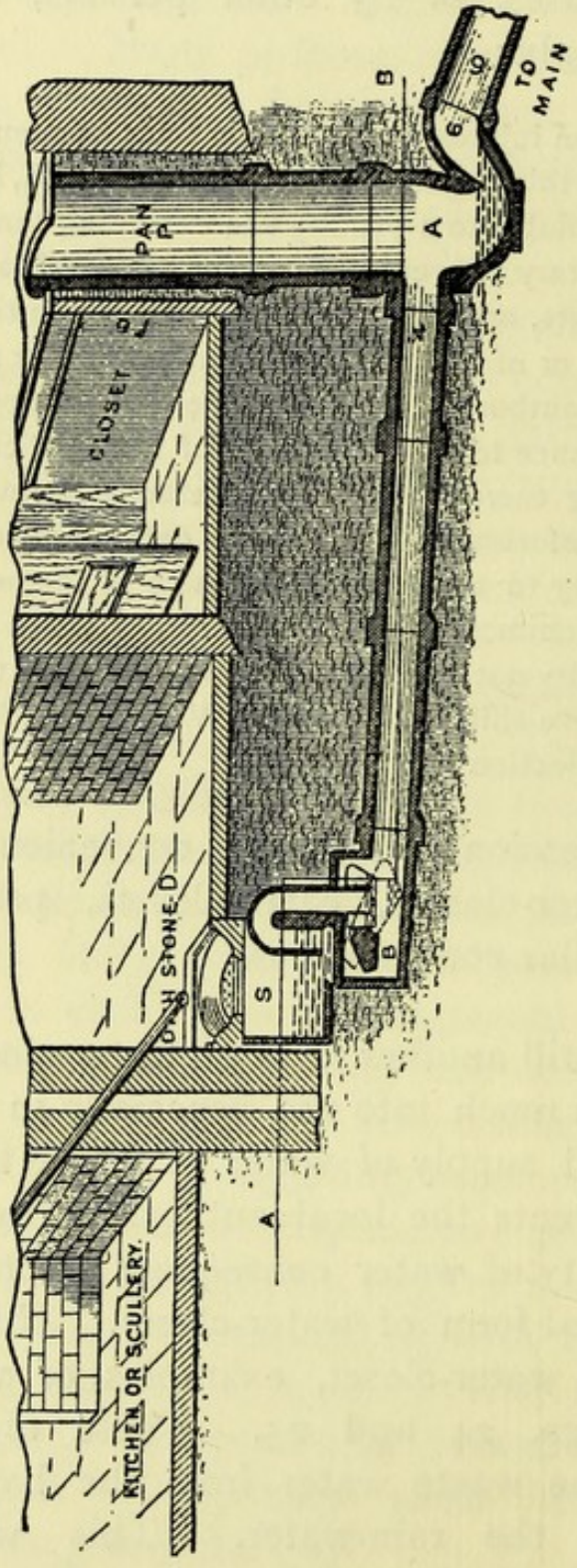


FIG. 24.—Empsall and Fish's patent slop water-closets.

flush away any deposit. I have no doubt that with ordinary care and a plentiful supply of water these

closets will be found superior to the privy or pail system, but the introduction of foreign matter into the drains renders these and the trough water-closet more liable to stoppage than the other forms of closet previously dealt with.

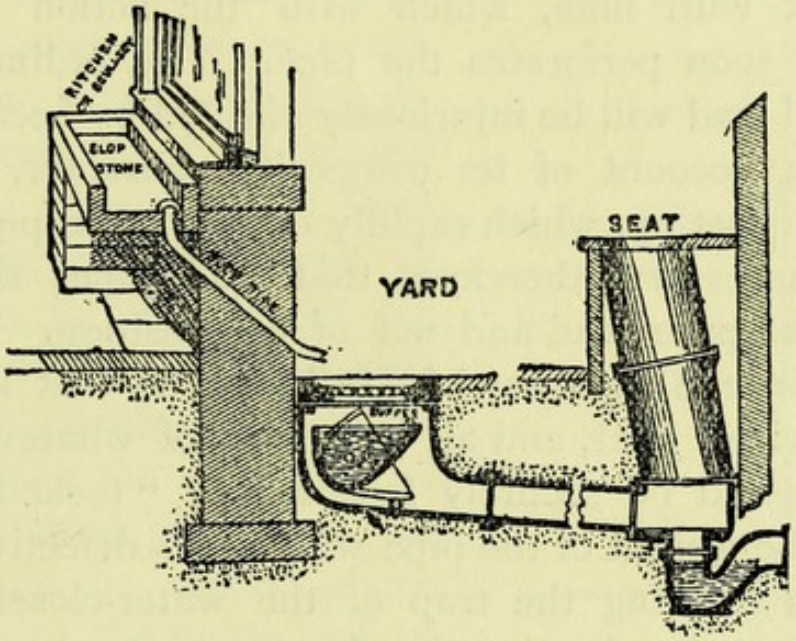


FIG. 25.—Ducket's slop water-closets.

Every water-closet in a building should be placed in such a position that one of its sides, at least, shall be an external wall; so that ample means may be taken for providing light and ventilation to the apartment, and ventilation to the drain or soil-pipe.

Fæces may be removed from the surfaces of water-closets by means of spirits of salts.

SOIL-PIPES, BATH, LAVATORY, AND SINK WASTE-PIPES.

THE soil-pipes for water-closets, and the pipes for baths, lavatories and sinks, are constructed of lead, iron, zinc, and earthenware. Lead is the best material that can be used for all such pipes, but particularly for soil-pipes.

Lead pipes should be "drawn" and not soldered together, as is often the case, for with soldered pipes the two metals have unequal rates of contraction and expansion, which often causes the seams to rend.

Lead is injuriously acted upon by sewer-gas and contact with lime, which with the action of fæcal matter soon perforates the pipe. The ordinary commercial lead will be injuriously affected by fæcal matter and on account of its composite character, galvanic action is set up, which rapidly destroys the pipe. It is very necessary, therefore, that lead pipes should be made of pure lead and not of composition. The best joint for lead pipes used for soil-pipes is that known as the "wipe" joint, and all soil-pipes, of whatever material, should be securely fastened or "tacked," otherwise, the weight of the pipe will cause defective joints, besides drawing the trap of the water-closets out of shape and thus leaving the closet untrapped.

Iron pipes when used for soil-pipes should be sufficiently stout, and not the ordinary rain-water pipes, and be jointed with lead, like an iron water-pipe. Joints made with putty should not be permitted to be used within a house. Soil-pipes should be placed in such a position as to be always accessible for examination and repairs.

Zinc pipes cannot under any circumstances be allowed for use as soil-pipes, but they are frequently used for baths, lavatories, and sinks, though the material has nothing to recommend it for this purpose, save its cheapness.

Earthenware pipes are sometimes used for soil-pipes, &c., but when raised to any great height they become dangerous, unless well secured, and they have the disadvantage of having a large number of joints.

The diameter of soil-pipes should not be less than $3\frac{1}{2}$ inches or greater than 4 inches, and if the material used is lead, they should weigh at least eight pounds per square foot, and it is absolutely necessary that such pipes be ventilated their whole sectional diameter, and carried in a vertical direction, three feet at least above the eaves of roof, as shown in fig. 26, or in the event of there being windows or other openings in close proximity to the upper end of the ventilating pipe, then the pipe should be carried above the ridge of the house roof, or in such other position as will afford a safe outlet for sewer air.

Anti-syphoning ventilating pipes are fixed in all good work to relieve pressure upon the traps of water-closets, these are sometimes connected to the ventilating pipe of the soil-pipe, as illustrated in fig. 26, at others, they are carried up independently to a safe position like the ventilating pipe of the soil-pipe.

In the *Sanitary Engineer* some time ago appeared the

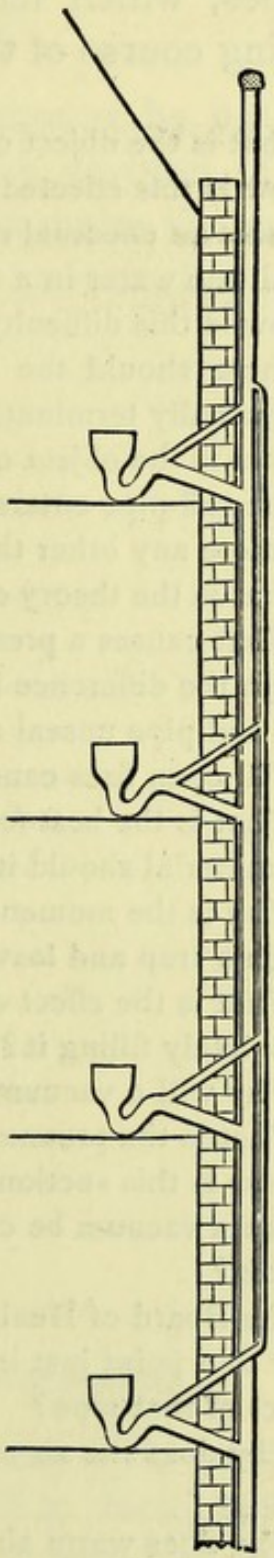


FIG. 26.—Showing the method of ventilating soil-pipes and traps of w.c's., with anti-syphonage pipe. (L. Parkes' *Hygiene*).

following questions upon the trapping and ventilation of soil-pipes, which have been set for the pupils in the plumbing course of the New York Trade School:—

1. What is the object of a trap?
2. How is this effected?
3. Is this an effectual remedy?
4. Will the water in a trap absorb gas and emit it again?
5. How is this difficulty overcome?
6. Where should the open end of a pipe be situated, and how is the pipe usually terminated?
7. What is the object of the trap required by the Board of Health where the soil-pipe enters the house?
8. Is there any other theory on this point?
9. What is the theory of the Board of Health in regard to this trap?
10. What causes a pressure from the sewers on the main trap?
11. Can the difference in temperature between the air in a sewer and in a soil-pipe unseal a trap?
12. Will open fires cause a suction on soil-pipes, and why?
13. What is the best form of a trap at the outlet of a soil-pipe, and of what material should it be?
14. Why is the momentum of a column of water not likely to carry it through a trap and leave the trap unsealed?
15. What is the effect of a column of water passing through a pipe and completely filling it?
16. Why will a vacuum suck the water out of traps?
17. What is the pressure of the atmosphere on a vacuum?
18. How is this suction prevented?
19. Can a vacuum be created in a pipe when it is only partly filled with water?
20. The Board of Health requires a 4-inch pipe to extend from the outer air to a point just inside the trap by the exterior wall; what is the object of that pipe?
21. Why does the air enter by this pipe and pass out at the top of the soil-pipe?
22. Why does warm air ascend?
23. Can a rush of water through the soil-pipe affect this ventilating pipe, and should any precaution be taken in regard to it?
24. Is it a good plan to run a soil-pipe in a flue, and why not?
25. How deep should the water-seal be in a running trap?

26. Is there any objection to a deep trap?
27. What is an air lock?
28. How does it affect the passage of water?

The rain-water pipe should on no account be used to ventilate the drain or soil-pipe, as the position of the upper end of such pipe would generally make an unsafe outlet for sewer-gas, while it would be practically of no

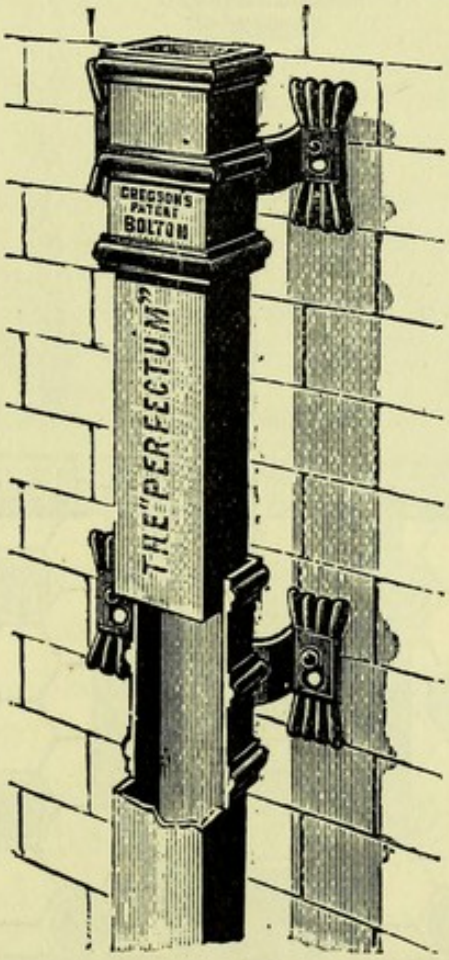


FIG. 27.—Open section showing sliding socket.

use for ventilation during heavy rains. To prevent damp walls from fractured pipes, and to facilitate repairs, soil-pipes and rain-water pipes should be hung as shown in fig. 27.

The best and most effectual way of dealing with waste-pipes from baths, lavatories, and sinks, is to let

the pipe discharge over a trapped gully in the open air, or should such an arrangement be objectionable then to carry the pipe, by an inlet specially made for that pur-

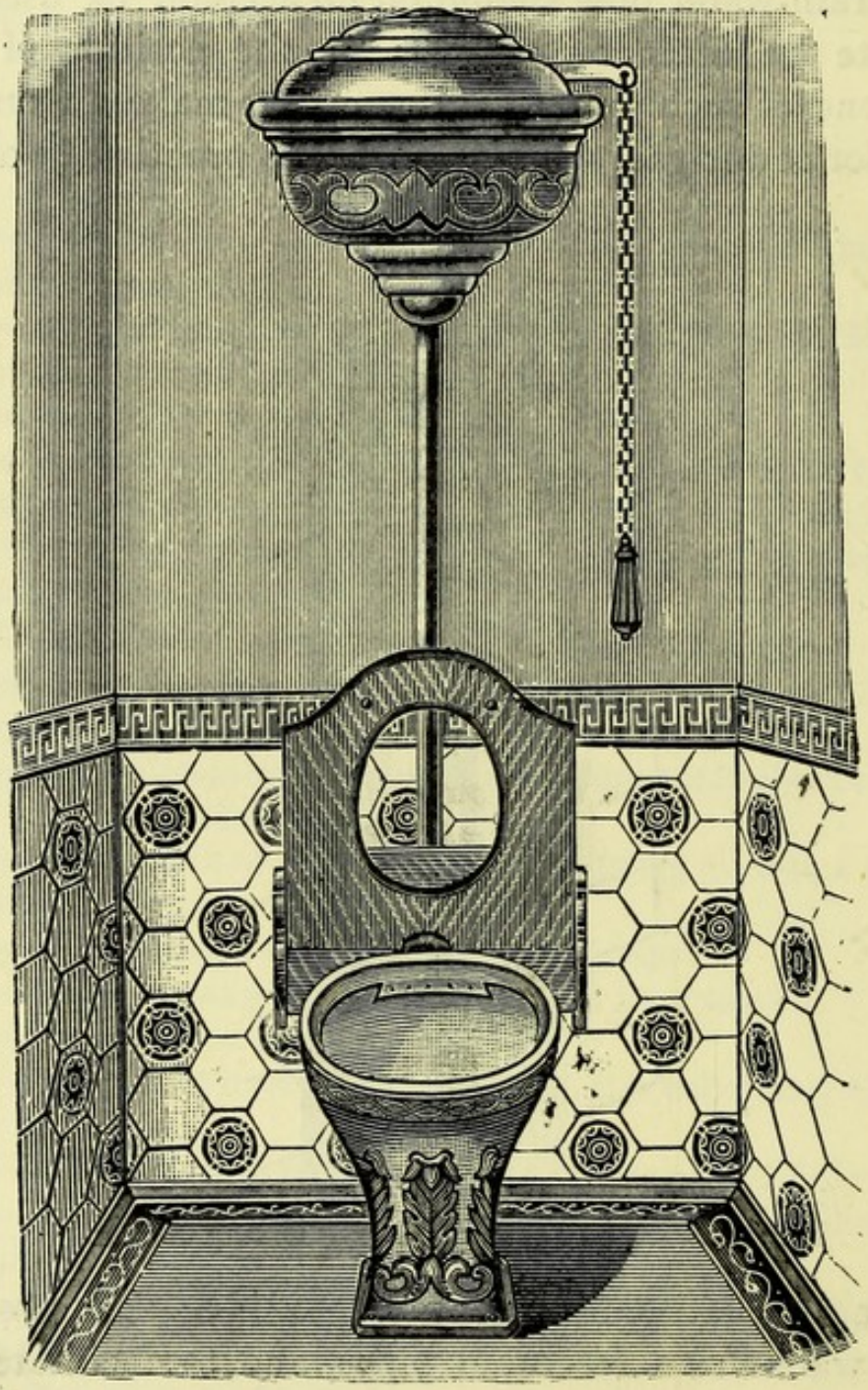


FIG. 28.—Complete pedestal closet and fittings.

pose in the side or back of the gully, under the grating of the gully.

The Model Bye-Laws of the Local Government Board provide that every bath, sink, or lavatory waste-pipe, shall be discharged in the open air, over a channel leading to a trapped gully grating at least 18 inches distant.

All waste-pipes of baths, lavatories, and sinks should be trapped, and in the case of the chamber-maid's slop sinks and urinal waste-pipes, properly ventilated as recommended for soil-pipes. This trapping is especially important should the waste-pipes be of considerable length, as owing to the difference of temperature between the internal and external air there is an almost continual movement of air from the outside to the inside of the house, the fresh air impinging against the foul matter lying upon the surface of the waste-pipes and giving rise to unpleasant smells.

The slop sinks and urinals in houses are being gradually abolished and the water-closet substituted for such purposes by having a hinged seat furnished thereto which can be raised when required for use as a slop-closet or urinal as illustrated by the pedestal form of closet in fig. 28.

The internal diameter of pipes used for bath, lavatory and sink wastes should not be greater than 3 inches nor less than $1\frac{1}{2}$ inches.

GULLIES AND TRAPS.

To every system of drains are furnished gullies and traps of some description.

For our purposes the term "gully" means an opening provided for receiving surface and the waste waters

of men and animals, while a "trap" is a barrier placed upon the drain or waste-pipe for the purpose of preventing a return of foul air from the sewer.

Gullies and traps have similar relations to each other, for although we may have traps without gullies, no gully is complete without a trap. The materials of which gullies and traps are usually made are, iron, lead, earthenware and brickwork lined with cement.

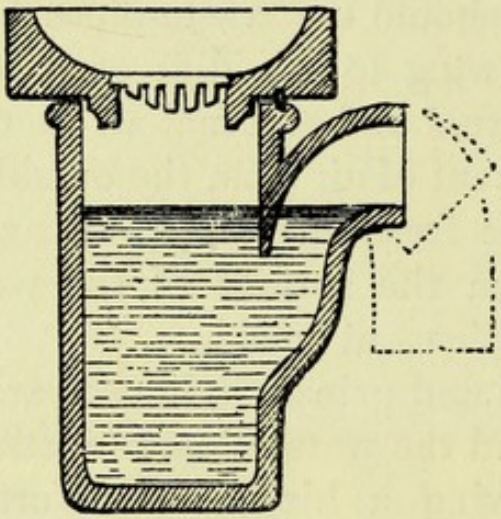


FIG. 29.—Yard gully trap.

Earthenware and lead are the best material to use, but frequently iron is adopted where strength is a necessity.

Figs. 29, 30 and 31 illustrate specimens of gully traps made of earthenware, fig. 30 being a flushing rim gully grease interceptor trap in connection with a flushing tank, as shown in figs. 6 and 7, which is regulated to discharge as often as the circumstances may prove to be necessary for the purpose of breaking up the grease and washing it down the drain, experience having shown that the ordinary grease trap becomes a positive nuisance if not regularly cleaned out.

Hellyer's anti-D-trap, which is now superseding the

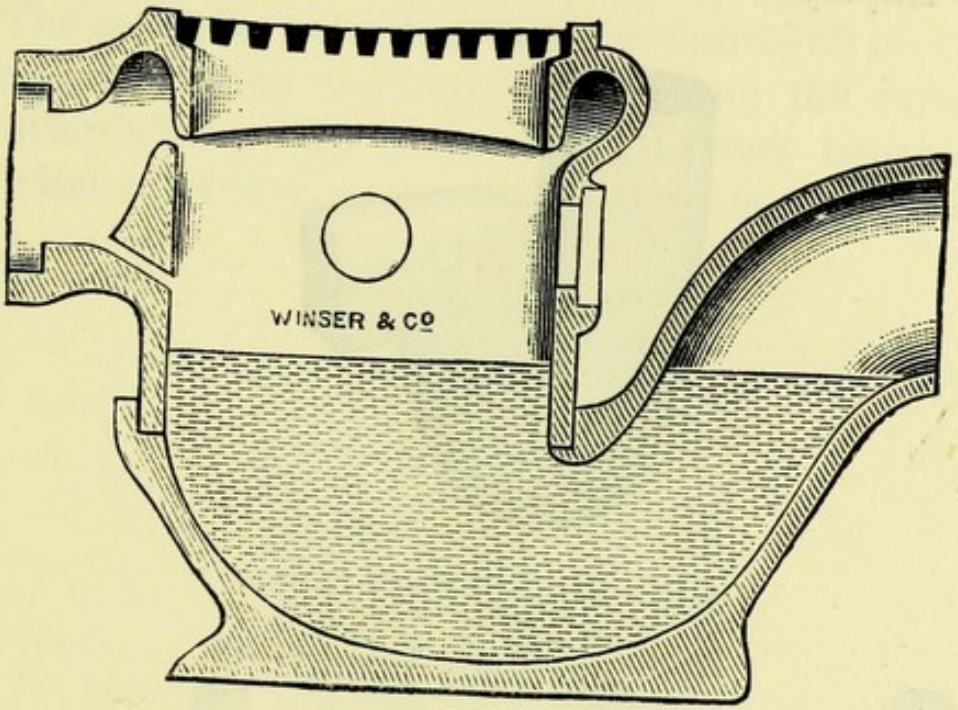


FIG. 30.—Winser's flushing rim gully trap.

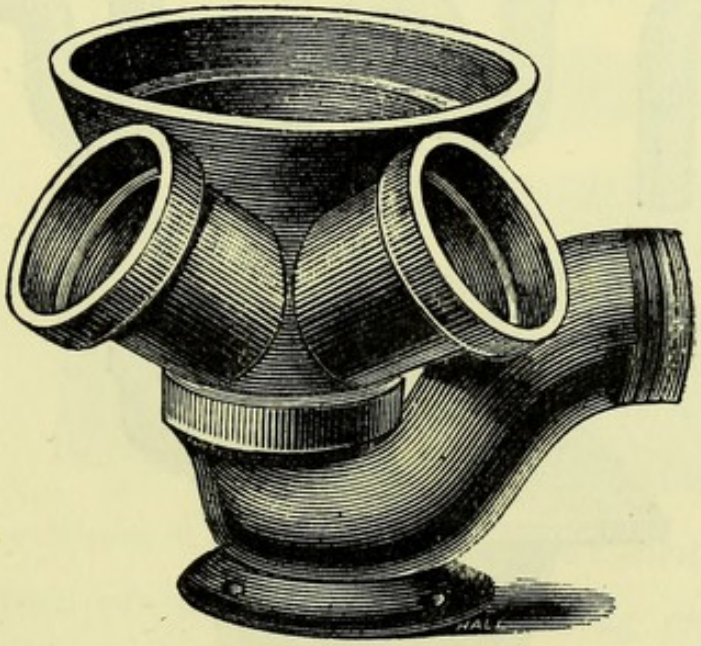


FIG. 31.—Bolding's "Simplex" reversible gully trap, with inlet under gully grating for receiving the waste-pipes.

old form of D-traps is illustrated in fig. 32, while fig. 33

gives examples of the P and S traps made of lead commonly employed for the waste-pipes of baths and sinks.

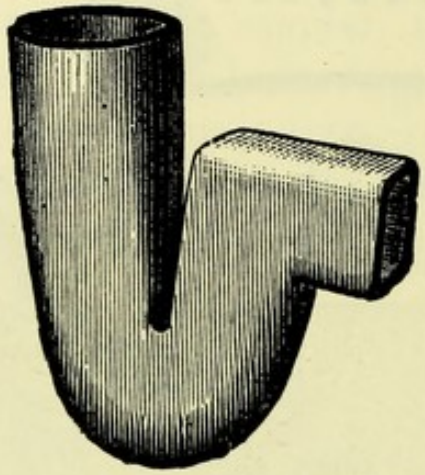


FIG. 32.—Hellyer's anti-D-trap.

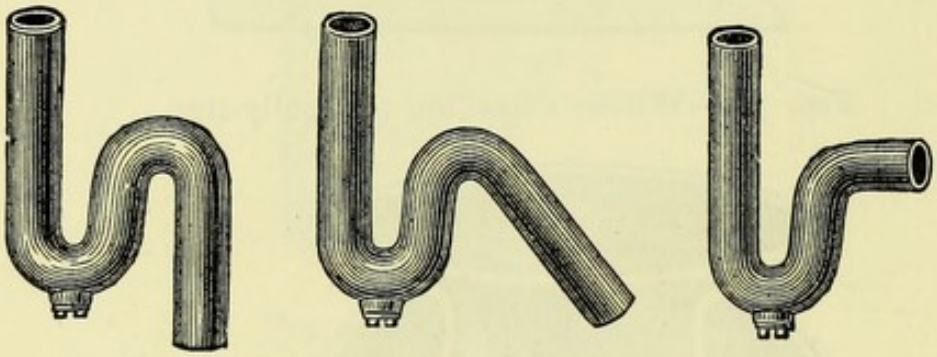


FIG. 33.—P and S traps.

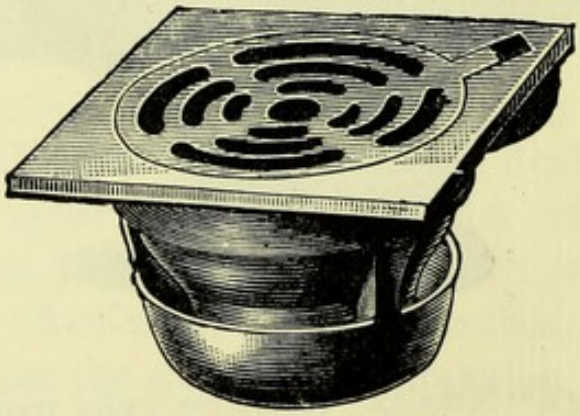


FIG. 34.—"Newland's" trap.

In figs. 34, 35 and 36, are shown traps of an objection-

able form, which the inspector should always regard with suspicion.

The seal of a water trap may be destroyed in various ways:—As when two traps are fixed on the same line of drain without any means of ventilation between, the admission of hot water into the drain will raise the

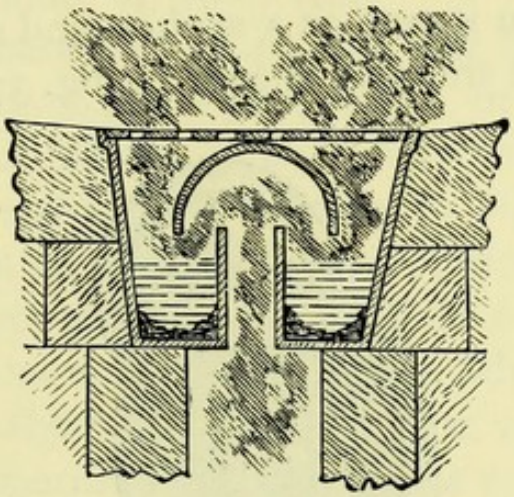


FIG. 35.—Bell trap (Corfield's *Dwelling Houses*).

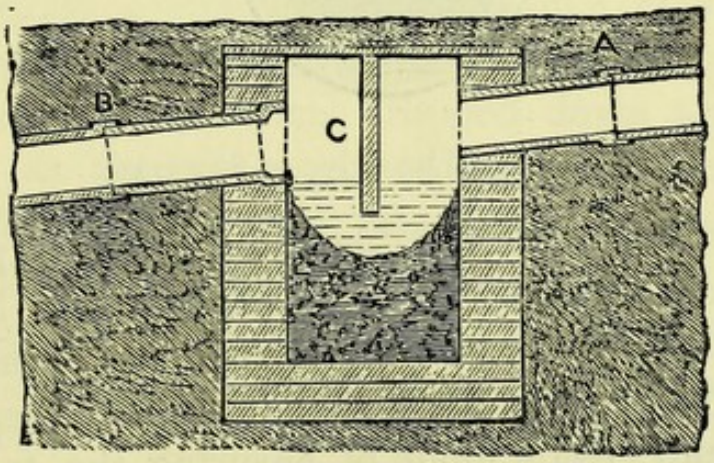


FIG. 36—.Mason or dip-stone trap (Corfield's *Dwelling Houses*).

temperature of the air therein causing expansion and resulting in one or both traps being forced. Evaporation will often cause shallow traps to become dry. Syphoning may happen to a trap from want of ventilation or the pipes running full bore a vacuum is created behind a column of water which sucks the water out of

the trap. The seal of a trap may be destroyed by capillary action caused by the entry of some foreign substance which would act as a syphon and drain every drop of water out of the trap, leaving it unsealed; for example, the traps of sinks are very apt to become untrapped in consequence of thread or hair entering and hanging partly in the water of the trap and partly down the drain, when it acts as a syphon and drains the trap.

Valve or flap traps as shown in fig. 37 are generally

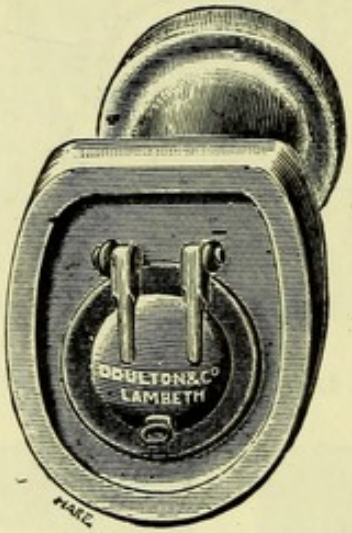


FIG. 37.—The valve or flap trap.

more defective and unreliable than water traps as they allow air, to some degree, to pass the valve. Moreover, the oxidation of the valves, if made of iron, and the injury the valve faces often sustain, render them a very imperfect and unsafe mode of ensuring the trapping of any opening communicating with the sewer, and such valves can only be looked upon as a palliation against the movement of sewer-air, and not as an effectual remedy to check its escape.

All new drains should be tested before being covered, and old drains will frequently require to be tested on the complaint of a nuisance.

The testing of drains can be carried out by one of three methods, and each method may of itself give satisfactory results.

The tests are usually of three kinds:—

(1) The peppermint, olfactory or scent test.

(2) The smoke test.

(3) The hydraulic or water test.

The first of these tests is carried out by the application of a measure of oil of peppermint or other volatile oil, say ¼ to ½ oz. of the liquid poured down a water-closet, sink or soil-pipe, according to where the smell complained of is strongest or most noticeable, followed by a pail or two of hot water. The operator should remain at his post until told to leave, while the second person scents about the premises for any perceptible smell of the peppermint that may have escaped through any defective drain or soil-pipe. A similar test is the "Banner drain grenade," an appliance made of thin glass charged with pungent and volatile chemicals—one of the grenades when dropped down any suitable pipe, such as the soil-pipe, breaks, or the grenade may be inserted through a trap into the drain by means of Banner's patent drain "explorer," an appliance made for floating the grenade through the trap, and afterwards exploding it inside the drain, and the smell from its contents is very perceptible. Hot water should also be ready to pour down the pipe after the "grenade," as above.

Kemp's drain tester, fig. 38, is a similar invention for detecting defects in drains and other pipes, but it has one important advantage over a mere "grenade," viz., the proof that its contents have been discharged into the drain.

Directions for using Kemp's test.—Remove cover of box (only), secure end of string. Lower tester in w.c., or gully trap; instantly throw down a pail of hot water, which will wash the tester through the trap into the drain, and in one minute the spring will break the paper band; the contents of the tube (which is a chemical of strong odour and a smoke producer) will be simultaneously discharged into the drain to discover

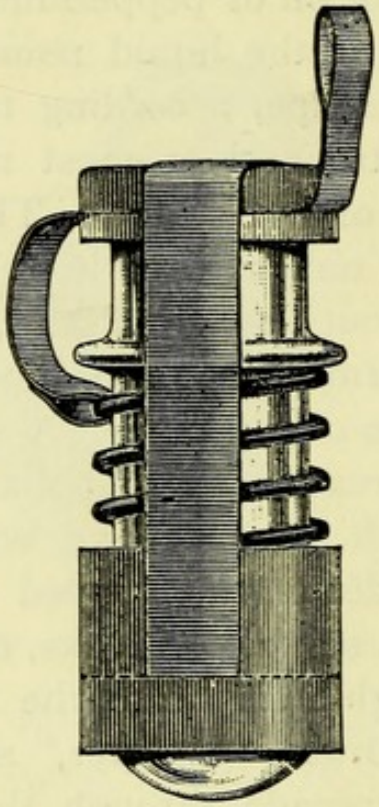


FIG. 38.—Kemp's drain tester.

unsound pipes and connections, which are easily detected by the odour of the chemical oozing from the defective parts. After the result is obtained (which will take about fifteen minutes) the string may be drawn back, with spring and cap attached, as a proof that the contents of the tube has been discharged into the drain satisfactorily, therefore a thorough test is made, at a small cost, without being misled.

Should the smell of the peppermint and the compounds contained in the grenade or drain tester not be perceived the inspector must not take it for granted that all is well but he may probably with advantage use the second or "smoke test."

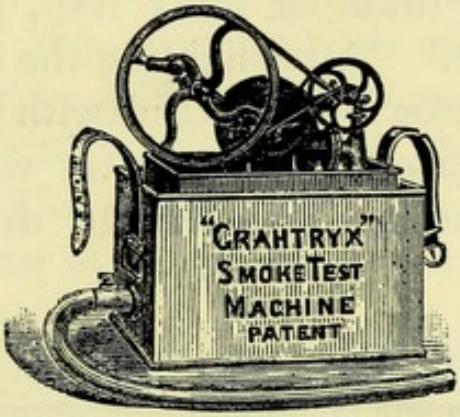


FIG. 39.—Smoke test machine.

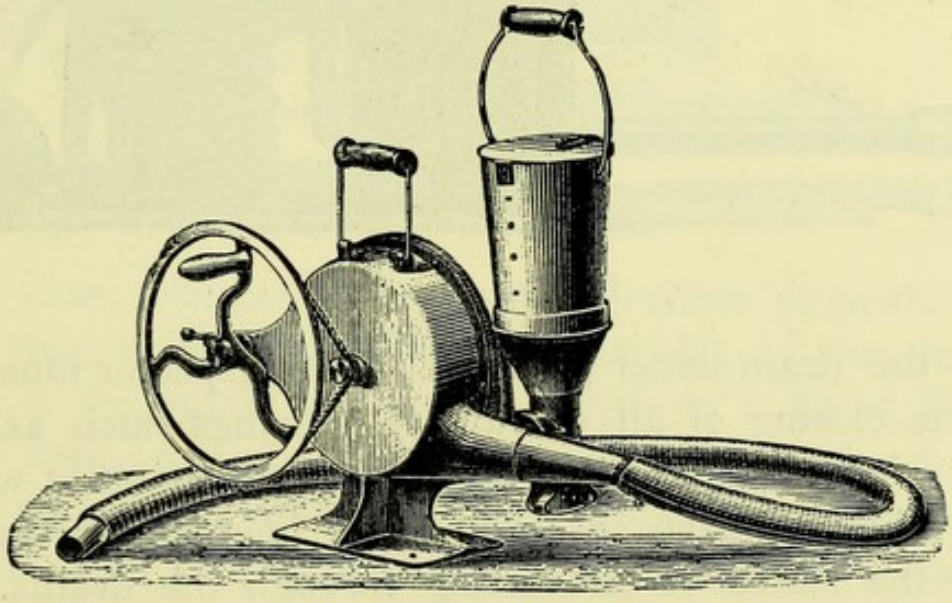


FIG. 40.—Asphyxiator.

This is sometimes done by placing a smoke rocket in the lower end of an open drain or suspending a rocket vertically through a hole made in a piece of wood fixed where the gully grating should be, the gully being emptied of its water, and afterwards lighting the rocket and sealing the cover with putty, mortar or other similar and convenient material.

The best way, however, of applying the smoke test is to have a smoke machine, as shown in figs. 39, 40 and 41.

These machines are furnished with an india-rubber tube several feet in length, one end of which may be inserted into the drain or gully trap, as was the case with the "rocket." After lighting the smoke-producing material, oily cotton waste mixed with sulphur, tobacco paper or other material, the operator will work the fan or bellows of the machine, thereby driving the smoke

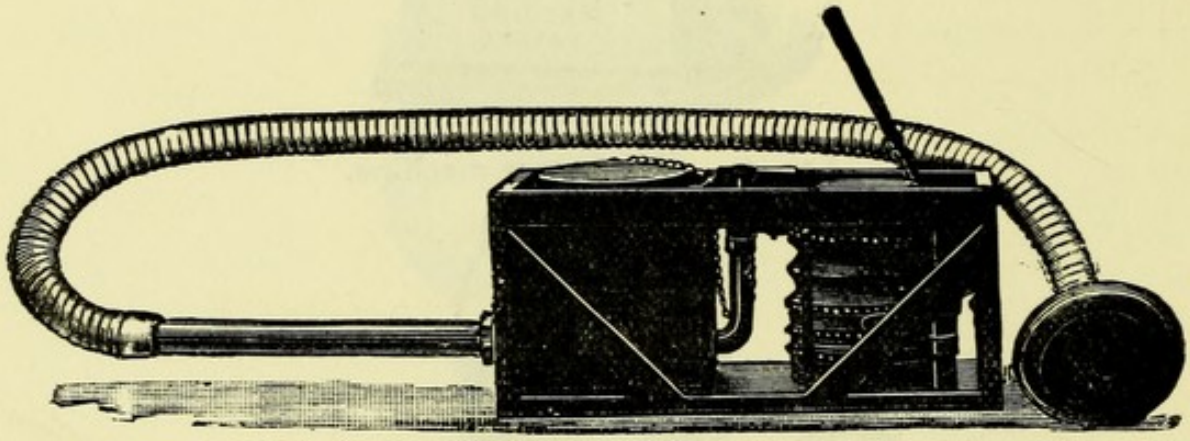


FIG. 41.—Eclipse.

into the drain under pressure. The inspector must see to the closing of all untrapped openings, such as soil and rain water-pipes, not forgetting the point at which the tube has been inserted, when he has ascertained that the smoke is circulating through the drains. If there are any defects in the drain or fittings, the smoke will soon be perceived. If, however, there should be no trap on the line of the drain as it passes from the premises on its way to the sewer it is sometimes difficult to get the smoke to show itself in the house, as the smoke is probably being blown into the sewer owing to the outward current of air which is going on.

If the inspector, as in the case with the scent test, finds no trace of the smoke in the house, he will not be justified in concluding that the drain is sound, but should apply the hydraulic or water-test. This is done from the disconnecting chamber or by having the lower end of the drain exposed and causing the opening next to the house to be stopped by plugging up the drain with cement or other suitable material, or better still by means of plugs, as shown in figs. 42 and 43. The stopper, shown in fig. 42, is by far the best and easiest of application, as it fits the pipes in

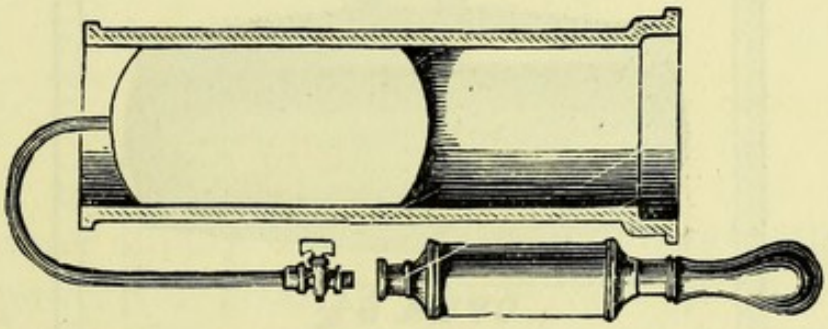


FIG. 42.—Drain stopper.

every case, whereas the expansion rubber stopper, fig. 43, owing to defects in the form or size of the drain pipes, is frequently found when required to be of little or no use. After the plug has been securely fixed the water should be poured into the drain until it is quite full and after examining the plug to see that the water is not escaping, the inspector should mark the water level and wait results for say thirty minutes to one hour, when—if there is no sign of the water falling, with which the drain is charged—he may conclude that the drains are satisfactory.

This is the most satisfactory of all the tests, as it never deceives the operator. In first class work the soil-pipes are also tested in this way, all traps of water-

closets being sealed up with sheet lead soldered over the inlets of the traps furnished with a small brass cock to allow the air in the pipes to escape as the water rises, each cock being closed as the water ascends.

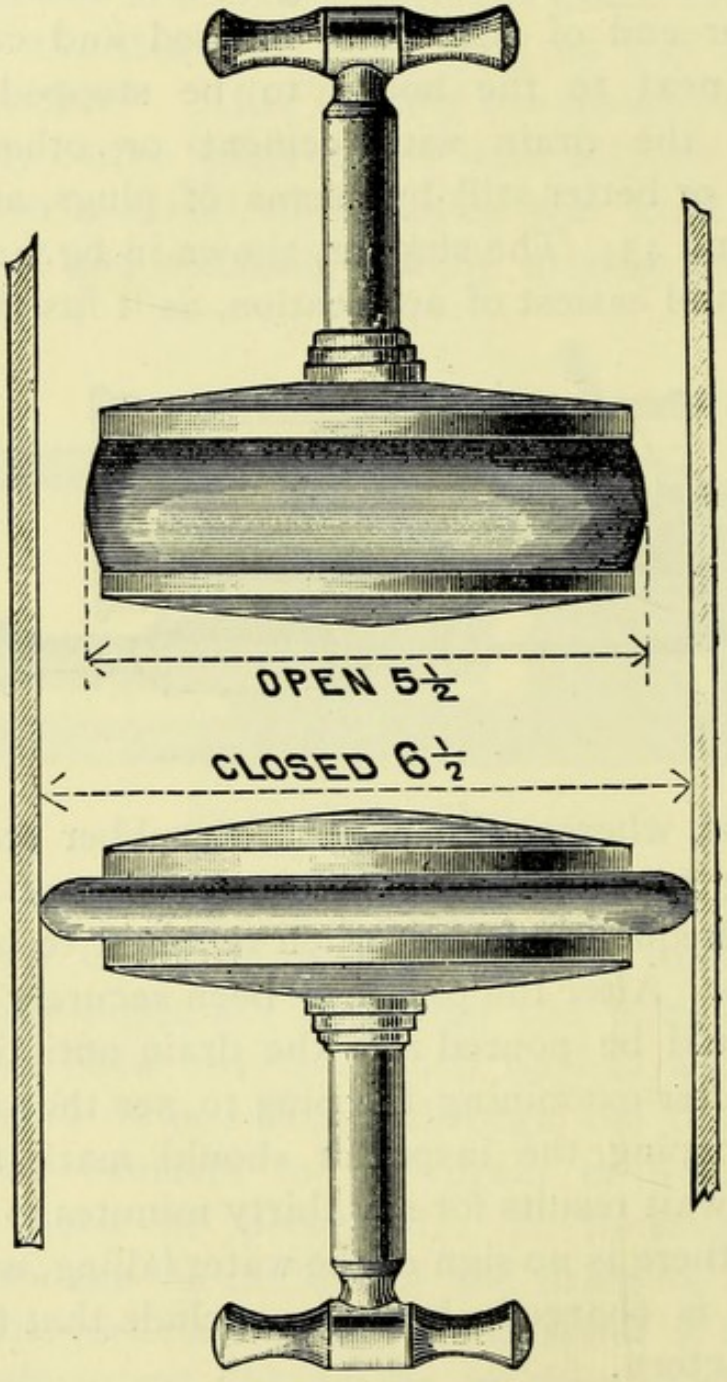


FIG. 43.—Drain stopper.

It may be necessary for the inspector upon complaint of smells in houses, he is called upon to examine, to

satisfy himself first that the smell which is perceived is sewer gas. The presence of sewer gas may be detected by means of unglazed paper saturated with a solution of acetate of lead in rain or boiled water, in the proportion of one ounce of the lead salt to eight ounces of water.

The paper should be allowed to partially dry and then hang it up in the room which is suspected to contain the deleterious gas, if sewer gas is present in any considerable quantity the paper will be completely blackened.

WATER SUPPLY.

The water supply of every town or village represents a vast power for good, to cleanse and refresh the air and earth, to irrigate and fertilize the soil, to support life, to drive machinery and to give wholesome drink to man and beast—misapplied it becomes a carrier of disease and death.

A sufficient supply of pure water is, therefore, a service of inestimable value in every household and its necessity is highly appreciated.

The rainfall of England and Wales varies considerably, from 20 inches on the east coast to 70 or 80 inches on the mountain districts of Wales and the water-sheds of the Westmoreland and Cumberland lakes. To calculate the amount of water given by rain we must know the amount of rainfall, and the area of the receiving surface, the rainfall is determined by a rain-gauge and the area of the receiving surface must be measured.

Supposing the rainfall amounts to 24 inches per annum.

and the area of the receiving surface 500 square feet, you multiply the area by 144 (number of inches in one square foot), and this by the rainfall, the product will give the number of cubic inches of rain which has fallen on the given area during the year. In calculating the receiving surface of a house-roof, the pitch or slope of the roof should not be taken into consideration, simply the area of the flat surface. To bring cubic inches into gallons, multiply by 40 and divide by 11091.

In estimating the annual yield of water from rainfall, and the yield at any one time, we ought to know the greatest annual rainfall, the least, the average, the period of the year when it falls, and the length of the rainless season. It must also be remembered that the amount of rainfall differs very greatly even in places near together.

Water is a compound of hydrogen and oxygen, in the proportion of two atoms of hydrogen to one atom of oxygen. It is a most powerful solvent, and it greedily absorbs and holds in solution, the gases which are present in the atmosphere.

Absolutely pure water is not to be found in its natural state, as in descending in the form of rain it carries impurities from the air through which it passes. In flowing over lands and percolating through the earth it gathers in its course mineral, vegetable and animal matters.

A pure natural water is clear, transparent, colourless, free from taste or smell. Bright sparkling water is very deceptive as it often owes its seductive appearance to contact with sewage.

The degrees of purity, as classified in the following table, appear in the sixth report of the Rivers Pollution Commissioners:—

Wholesome	1. Spring water	very palatable.
	2. Deep well water	
	3. Upland surface water	moderately palatable.
	4. Stored rain water	
Suspicious	5. Surface water from cultivated land	palatable.
Dangerous	6. River water to which sewage gains access	
	7. Shallow well water	

The most wholesome water for potable purposes is that obtained :—

1. From rivers and lakes in barren and uninhabited mountainous districts, where the rainfall is heavy and flows rapidly off the land.

2. From deep wells and springs.

The geological formations most favourable for well sinking are, the new red sandstone, chalk and oolites. They form excellent filters, and as the water percolates slowly through the interstices of the rocks, organic impurities are to some extent arrested or so changed as to remove any danger there might otherwise have been in drinking the water.

Wells should not be sunk in populous districts, nor in proximity to cesspools, privies and manure heaps.

Rivers and streams polluted with sewage are not safe sources of supply, though there may be no visible evidence of sewage where the water is abstracted.

Rain water collected from the roofs of houses and other buildings varies in quality according to the state of the atmosphere through which it descends, of the surface upon which it falls, and the receptacle in which it is stored. If proper precautions are taken to ensure the cleanliness and fitness of the receiving surface and tank, there is no reason why rain water should not be ob-

tained from the roofs of houses and other buildings in rural districts. But in towns, especially manufacturing towns, owing chiefly to the state of the atmosphere it would be dangerous to drink such water.

Fig. 44 illustrates a very ingenious though simple contrivance for separating the rain water, and will be found of the greatest service to the occupiers of country houses and where the collection of rain water is indispensible.

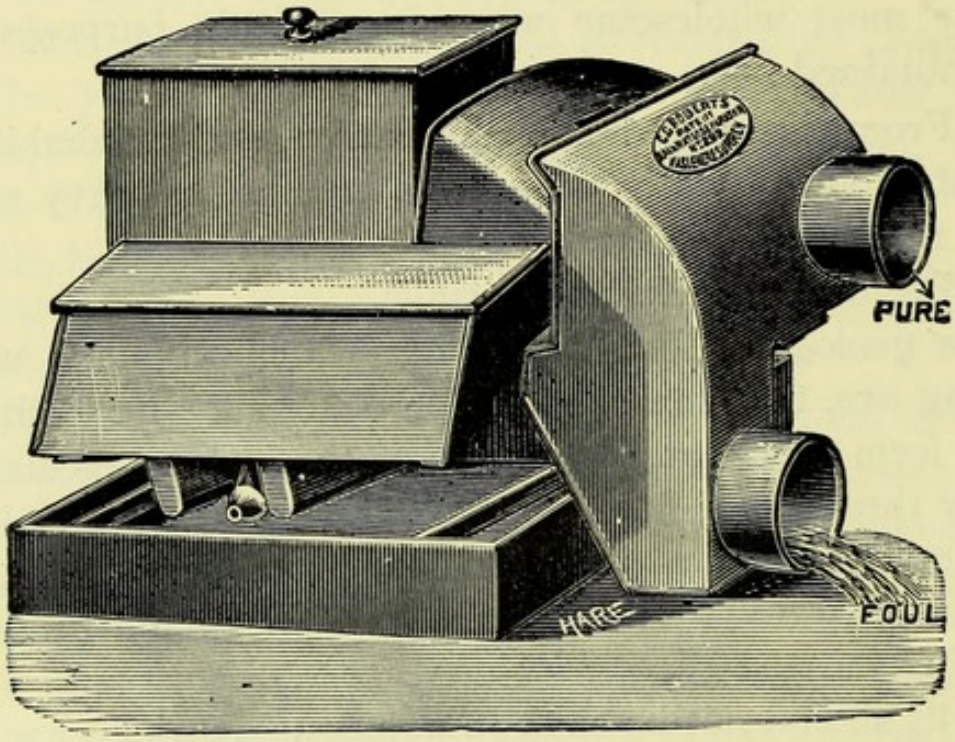


FIG. 44.—Roberts' rain water separator.

The rain water separator as it is called has no resemblance to a filter. Instead of attempting to obtain pure from foul water, it rejects the dirty and stores the clean water. It is made of zinc upon an iron frame, and the centre part, or canter, is balanced upon a pivot. It is self-acting, and directs into a waste pipe, or foul water tank, the first portion of the rainfall that washes off, and brings down from the roofs soot and other impurities. After rain has fallen a certain time, the separator cants and turns the pure water into the storage tank.

The Horizontal Separator consists of a fixed head that receives the water, and a fixed outlet box, with two delivery pipes for foul and pure water respectively. The canter, or third part of the separator, is removable, and is balanced upon a pivot resting in two grooves in the iron frame beneath it. A heavy weight on the back of the canter keeps the front of it usually lifted up in the position shown in figure 44; there are two open channels in the upper part of the canter; when the canter is *up*, the front channel directs the water that comes from the head into the (lower) foul water delivery pipe; when the canter is *down*, the back channel directs the water into the (upper) pure water delivery pipe. The action can be shown by placing the hand upon the front of the empty canter and pressing with sufficient force to overcome the weight on the opposite side.

The value of spring and deep well waters is not merely due to their greater intrinsic chemical purity and palatability, but to their being peculiarly suited for domestic supply from their almost invariable clearness, their uniformity of temperature throughout the year, rendering them cool and refreshing in summer, and preventing their readily freezing in winter (De Rance).

The report of the Rivers Pollution Commissioners states that only water derived from wells more than 100 feet in depth, and from deep-seated springs, can be considered reasonably safe, for in these the organic matter contained in the water is rapidly oxidised in percolation through porous and aërated soil and permeable rock.

Hard water not only acts injuriously in washing, through the waste of soap, and to the skin by clogging the pores with curdy matter, but, when employed in the generation of steam, forms dangerous and troublesome

incrustations in the boiler, especially where the temporary hardness is very great.

Hardness of water caused by the presence of bicarbonates of lime and magnesia, is called "temporary" hardness, because, to some extent, it can be removed by boiling; hardness due to the presence of sulphates of lime and magnesia is not diminished by boiling, and is therefore termed "permanent" hardness.

The distribution of water in towns on the constant or intermittent systems of supply is effected by aqueducts and pipes. A constant supply of water is defined by the "Water Works Clauses Act" as a supply "constantly" laid on at such a pressure as will cause the water to reach the top storey of the highest houses within the limits of the Special Act. The advantages of a constant service of water, are briefly:—

1. That the water can be obtained from a tap in direct communication with the main at any time, except when shut off for repairs, alterations or extensions.

2. Store cisterns are unnecessary, except for trade and hot water purposes; risks connected with stagnant water, improper connections of supply pipes to W.C's., &c., and overflow pipes to drains are obviated.

3. Risks of pollution through defective pipes are reduced to a minimum, as the pipes are seldom empty.

4. The pipes are less liable to rust; air in the presence of a little moisture, causes rapid corrosion.

5. There is an abundant supply of water always ready in case of fire.

The "intermittent" supply has the following disadvantages:—

1. The water is turned on only for a limited period each day, varying from one to several hours.

2. The storage of water in cisterns, butts, and other

receptacles, renders the water liable to pollution, besides which it entails expense in the erection and maintenance of such vessels.

3. The impurity of cistern water leads to the use of filters, which are seldom, if ever, cleaned out, and thereby aggravate the evil they are intended to remedy.

4. The want of adequate storage accommodation leads to the use of kettles, pans, jugs and other unsuitable utensils which are generally exposed to the vitiated air of the over-crowded rooms, and a pure water supply under such conditions is impossible.

5. The withdrawal of the water from the mains causes a vacuum or partial vacuum in the pipes and consequently foul gases may be drawn into the mains through defective pipes and open taps.

6. Except during the hours of distribution, and unless special fire mains are provided, no water can be obtained to extinguish fires until the turn-cock or fireman has turned on the water. This operation often causes delay at the most critical time in the progress of the fire. Waste of water through defects in pipes and open taps when the water is turned on under these circumstances will interfere greatly with the pressure, thereby necessitating the use of the pump.

7. Under the intermittent system a larger staff of turn-cocks has to be employed.

8. Where only a short or irregular intermittent service is given, the pressure from the mains cannot be used for motive powers. As regards the modern system of a separate water supply to each house, there are many useful and ingenious, though often complicated, sanitary appliances. The introduction of these appliances has been much more rapid and general than the education of the public in the use of them; hence the

ignorance which prevails causes considerable trouble and expense.

The Public are seldom concerned about their cisterns, butts, or taps, so long as they get water which is clear and palatable. They expect the Water Works Authorities to exercise whatever supervision may be necessary, forgetting that the Water Works regulations are designed to prevent waste, and to ensure payment for the water supplied; it will, therefore, be the sanitary inspectors duty to keep an eye on the condition of the store cistern and other water fittings.

The materials of which cisterns are made for the storage of water for potable purposes are: wood, lead and zinc lined, slate, iron, stone, or brick-work with a cement lining. The use of lead lined cisterns for the storage of drinking water has been repeatedly condemned by the medical faculty owing to the action of certain (soft) waters upon lead. The waters which act most on lead are the purest and most highly oxygenated and those containing organic matter, while those waters which act least on lead are those containing carbonic acid, calcium carbonate and calcium phosphate (Parkes). Water seldom acts upon tarnished lead, but where new cisterns with lead linings are fixed, or existing cisterns are repaired, the bright lead should be exposed to water for several days, the water thus exposed being entirely drawn off before the cisterns are brought into use and water drawn therefrom for dietetic purposes.

Zinc and galvanised iron cisterns are also acted on by the water, and may produce metallic poisoning, though as a matter of fact, zinc and galvanized iron cisterns are in general use, without any apparent serious results.

The overflow pipes of all cisterns, fixed inside houses, should be taken through an external wall, and under no

circumstances should such pipes communicate with any drain or soil pipe.

All cisterns must be furnished with a suitable and well-fitting cover, and they should be placed in such a position as to be at all times easy of access for cleaning and repairs.

The situation of the cistern as regards chances of pollution of the water is of the first consideration. When cisterns are placed in exposed positions, and therefore liable to be affected by frost, they should be carefully protected from the influence of the weather by an exterior lining of wood, felt or brick-work, the space being filled in with several inches of sawdust, care being taken to protect the latter from getting wet.

In England it is seldom that frost penetrates to a greater depth than 2 or 3 feet below the surface of the ground, and it is customary to lay the water-pipes at about that depth underground; in the case of pipes which are in exposed situations it is necessary to protect the pipes from frost, and this is frequently done by covering them with felt and sawdust or other non-conducting material. The bursting of cisterns may be prevented by putting in a block of wood or a weighted hollow india-rubber ball or other elastic body. If pipes are laid against an external wall they should be fastened to a board and not allowed to be in direct contact with the wall.

The quantity of water consumed per head of the population varies from 5 to 15 gallons per head per day for cottages, this would include water for the water-closet; but in the case of larger houses where there are a number of water-closets, and the baths are freely used it often reaches 70 gallons per head per day.

The total rate of 25 gallons per head per day is a

liberal allowance for all domestic, trade, sanitary, and public purposes, including waste, of a town in which there is considerable, but not exceptional, manufacturing industries, and in which water-closets are not in general use.

In water-closet towns 30 gallons per head per day would be sufficient for all purposes.

The late Dr. Parkes recommended the following estimate of the daily allowance of water for all purposes :—

Particulars of Supply.	Gallons per Head of Population.
Domestic purposes	12
General baths	4
Water-closets	6
Unavoidable waste	3
Total house supply	25
Municipal purposes	5
Trade purposes	5
Total	35

If the inspector finds that water is being wasted he should make it his duty to report the matter to the water-works engineer, as excessive waste of water is attended by no corresponding advantage. There is a popular impression that the cleansing of drains and sewers is promoted by the waste of water from taps and W.C's.; this is a mistake. Drains and sewers can only be effectually flushed by the sudden discharge of a sufficient volume of water from their highest point, and the quantity required to do this is very small in proportion to the total consumption of any town.

This table shows the capacity of store cisterns of the dimensions given :—

Gallons.	Length.		Width.		Depth.	
No.	ft.	in.	ft.	in.	ft.	in.
30	2	0	1	6	1	8
40	2	7	1	6	1	8
50	2	7	1	7	2	0
60	2	7	1	9	2	2
70	2	10	1	10	2	2
80	3	0	2	0	2	2
90	3	0	2	0	2	6
100	3	0	2	2	2	6
150	3	7	2	5	2	10
200	4	0	2	8	3	0
300	4	0	3	6	3	6
400	4	0	4	0	4	0
500	5	0	4	0	4	0
750	6	0	5	0	4	0
1000	7	0	6	0	4	0

An imperial gallon contains 10 pounds of distilled water at 62° F., and a cubic foot contains 6¼ imperial gallons.

The following sections have regard to water supply:—

"Where on the report of the surveyor of a local authority it appears to such authority that any house within their district is without a proper supply of water, and that such a supply of water can be furnished thereto at a cost not exceeding the water rate authorised by any local Act in force within the district, or where there is not any local Act so in force at a cost not exceeding twopence a week, or at such other cost as the Local Government Board may, on the application of the local authority, determine under all the circumstances of the case to be reasonable, the local authority shall give notice in writing to the owner, requiring him, within a time therein specified, to obtain such supply, and to do all such works as may be necessary for that purpose." (38 & 39 Vic., C. 55, S. 62).

A rural authority under 41 & 42 Vic., C. 25, S. 3, has power to enforce an order to supply water to any house within *their* district if it appears to them upon the report of the Inspector, &c., "that any occupied dwelling-house has not available a supply of wholesome water within reasonable distance."

An occupied house without a proper and sufficient supply of water shall be a nuisance liable to be dealt with summarily under this Act

and if it is a "dwelling-house," shall be deemed unfit for human habitation. (54 & 55 Vic., C. 76, S. 48).

"A house which after the commencement of this Act is newly erected, or is pulled down to or below the ground floor and rebuilt, shall not be occupied as a dwelling-house until the sanitary authority have certified that it has a proper and sufficient supply of water, either from a water company or by some other means." (54 & 55 Vic., C. 76, S. 48, Sub-Sec. 2).

"If the Sanitary Authority refuse such certificate, or fail to give it within one month after written request for the same from the owner of the house, the owner of the house may apply to a Petty Sessional Court, and that Court, after hearing or giving the Sanitary Authority an opportunity to be heard, may, if they think the certificate ought to have been granted, make an Order authorising the occupation of the house; but unless such Order is made, an owner who occupies or permits to be occupied the house as a dwelling-house without such certificate shall be liable to a fine not exceeding ten pounds, and to a fine not exceeding twenty shillings for every day during which it is occupied until a proper and sufficient supply of water is provided but the imposition of such a fine shall be without prejudice to any proceedings for obtaining a closing order." (54 & 55 Vic., C. 76, S. 48, Sub-Sec. 3).

"Where a water company may lawfully cut off the water supply to any inhabited dwelling-house, and cease to supply such dwelling-house with water for non-payment of water-rate or other cause, the Company shall in every case, within twenty-four hours after exercising such right, give notice thereof in writing to the Sanitary Authority of the district in which the house is situate." (54 & 55 Vic., C. 76, S. 49).

The pollution of water is of serious moment, and is most common in towns having an intermittent supply, and in villages where the shallow wells or domestic pumps are in use. In the case of water stored in cisterns the pollution of the water generally arises from the deposits of foreign matter in the cistern, such as birds' droppings, decayed leaves, dust, rats, mice, birds and other objectionable matters which are sure to find their way into such receptacles.

Water is liable, as before stated, to lead and other metallic contaminations from the use of unsuitable materials for cisterns, &c.

Water is frequently found to be polluted with foul gases which it has absorbed, and the water in shallow and other wells is often rendered unfit for use owing to the percolation of liquid matter from privies, drains, manure heaps and surface washings finding their way into the water.

No water-closet should be supplied with water from the drinking-water cistern, unless such closet is furnished with a water-waste preventer or compound flushing cistern, or, as is frequently done in the supply of water to valve closets, provided with a regulating valve or tap fixed under the W.C. seat. Should the Inspector have reason for doubting the quality of the water supply to any house in his district the following provisions will have effect :—

"On the representation of any person to any local authority that within their district the water in any well, tank, or cistern, public or private, or supplied from any public pump, and used or likely to be used by man for drinking or domestic purposes, or for manufacturing drinks for the use of man, is so polluted as to be injurious to health, such authority may apply to a court of summary jurisdiction for an order to remedy the same; and thereupon such court shall summon the owner or occupier of the premises to which the well, tank or cistern belongs if it be private, and in the case of public well, tank, cistern, or pump, any person alleged in the application to be interested in the same, and may either dismiss the application, or may make an order directing the well, tank, cistern, or pump to be permanently or temporarily closed, or the water to be used for certain purposes only, or such other order as may appear to them to be requisite to prevent injury to health of persons drinking the water.

The court may, if they see fit, cause the water complained of to be analysed at the cost of the local authority applying to them under this section.

If the person on whom an order under this section is made fails to comply with the same, the court may on the application of the local authority authorise them to do whatever may be necessary in the execution of the order, and any expenses incurred by them may be recovered in a summary manner from the person on whom the order is made.

Expenses incurred by any rural authority in the execution of this section, and not recovered by them as aforesaid, shall be special expenses." (38 & 39 Vic., C. 55, S. 70 also 54 & 55 Vic., C. 76, S. 54).

"Source of water supply" means any stream, reservoir, aquaduct, pond, well, tank, cistern, pump, fountain, or other work or means for the supply of water, whether actually used or capable for the supply of water or not. (54 & 55 Vic., C. 76, S. 141).

"Cistern" includes a water-butt. (54 & 55 Vic., C. 76, S. 141).

If the Inspector suspects that the water supply is polluted, he must immediately report the circumstances to the Medical Officer of Health for the district and to the local authority who will probably instruct him to take a sample of the water for purposes of analysis.

A Winchester quart bottle, which holds about half a gallon, stoppered or furnished with a clean cork, should be used for collecting samples of water, care being taken to see that the bottle is absolutely clean.

If the sample of water is taken from a river or reservoir the vessel should be carefully immersed in the water so that the top or neck of the bottle is below the surface.

After the bottle has been securely tied marked or sealed, the sample should be immediately sent or taken personally to the analyst, at the same time handing him written particulars as to the source of the sample and the circumstances under which it was taken.

INFECTIOUS DISEASES AND DISINFECTION.

The introduction of an Act for the compulsory notification of infectious disease has added great responsibility to the duties of the Sanitary Inspector, the performance of which is attended with considerable risk of health and even life itself.

Prior to the passing of the "Infectious Disease (Notification) Act, 1889," there were about 50 towns in England and Wales where such compulsory powers had been obtained by private Acts.

The reporting of infectious cases is generally of a dual description, that is to say, the medical attendant as well as the occupier of the house in which the person sick is retained, or the person in charge of such patient are made liable to notify the case "immediately upon becoming aware of the nature of the illness," to the Medical Officer of Health of the district.

The expression "infectious disease" means any of following diseases, namely, small-pox, cholera, diphtheria, membranous croup, erysipelas, the disease known as scarlatina, or scarlet fever, and the fevers known by any of the following names, typhus, typhoid, enteric, relapsing, continued, or puerperal (54 & 55 Vic., C. 76, Section 55).

The above definition of infectious disease is the same as that given in section 6 of the "Infectious Diseases (Notification) Act, 1889."

The law of notification as regards infectious disease is, as follow:—

"Where an inmate of any building used for human habitation within a district to which this Act extends is suffering from an infectious disease to which this Act applies, then, unless such building

is a hospital in which persons suffering from an infectious disease are received, the following provisions shall have effect, that is to say —

(*a*) "The head of the family to which such inmate (in this Act referred to as the patient) belongs, and in his default the nearest relatives of the patient present in the building or being in attendance on the patient, and in default of such relatives every person in charge of or in attendance on the patient, and in default of any such person the occupier of the building shall, as soon as he becomes aware that the patient is suffering from an infectious disease to which this Act applies, send notice thereof to the medical officer of health of the district.

(*b*) "Every medical practitioner attending on or called in to visit the patient shall forthwith, on becoming aware that the patient is suffering from an infectious disease to which this Act applies, send to the medical officer of health for the district a certificate stating the name of the patient, the situation of the building, and the infectious disease from which, in the opinion of such medical practitioner, the patient is suffering.

"Every person required by this section to give a notice or certificate who fails to give the same, shall be liable on summary conviction in manner provided by the Summary Jurisdiction Acts to a fine not exceeding forty shillings.

"Provided that if a person is not required to give notice in the first instance, but only in default of some other person, he shall not be liable to any fine if he satisfies the court that he had reasonable cause to suppose that the notice had been duly given." (52 & 53 Vic., C. 72, S. 3; and 54 & 55 Vic., C. 76, S. 55).

"The local authority shall gratuitously supply forms of certificate to any medical practitioner residing or practising in their district who applies for the same, and shall pay to every medical practitioner for each certificate duly sent by him in accordance with this Act a fee of two shillings and sixpence if the case occurs in his private practice, and of one shilling if the case occurs in his practice as medical officer of any public body or institution." (52 & 53 Vic., C. 72, S. 4).

"Where a medical officer of health receives a certificate under this section relating to a patient within the Metropolitan Asylum district, he shall, within twelve hours after such receipt, send a copy thereof to the Metropolitan Asylum Managers, and to the head teacher of the school attended by the patient (if a child), or by any child who is an inmate of the same house as the patient. The Metropolitan Asy-

lum Managers shall repay to the sanitary authority the fees paid by that authority in respect of the certificates whereof copies have been so sent to the Managers. The Managers shall send weekly to the county council, and to every medical officer of health, such return of the infectious diseases of which they receive certificates in pursuance of this section as the county council require." (54 & 55 Vic., C. 76, S. 55).

The inspector upon receiving a report of a case of infectious disease from the Medical Officer of Health should with all dispatch proceed to the house referred to in the certificate, making enquiries as to the means available for the isolation of the patient at home, but always endeavouring to persuade the parents or guardians of the patient to allow the case to be removed to the sanatorium or fever hospital, if there be one in the district, and afterwards inspecting the house and its surroundings, and arranging for the disinfection of the house, bedding, &c.

If the Sanitary Inspector should hear of, or himself discover, any suspected case of infectious disease, not reported, he should immediately acquaint the Medical Officer of Health of the facts, and take his instructions thereon.

To facilitate the necessary enquiries into infectious cases, and the inspection of infected houses I have devised a form and list of questions for enquiry when visiting such houses, as follows:—

Date of Certificate. Date the Certificate was received.

Name of Patient. Age.

Address.

Description of Disease.

Source of Infection (if ascertained).

Milk Supply.

Sanitary Condition of house and surroundings.

Isolation, Home or Hospital.

„ Name of Hospital.

Date of removal to Hospital.

School attended by the patient.

„ „ by other children in house (if any).

Name of Medical Attendant.

Name of Officer making the Inspection.

This information should be carefully noted and afterwards entered in a book to be called the "Infectious Disease Register" with a few other columns added to record the particulars as to disinfection of rooms, bedding &c., as follows :—

If Vaccinated. (In Case of Small-Pox).	Particulars of Disinfection.					Expenses of Disinfection Recovered (If Any).			Remarks.
	Date of Disinfection		No. of Rooms Cleansed.	No. of Rooms Fumigated.	No. of Beds Disinfected.	No. of Articles Disinfected.	£.	s.	d.	

It will then form a complete history of each case reported or discovered, which, with the particulars as to measures adopted for preventing the spread of disease in the shape of disinfection will provide an easy means of reference for the Sanitary Authority, the Medical Officer of Health and, in case of an epidemic, the Medical Inspector of the Local Government Board.

If an index is provided at the end of the "Register" this could with advantage be utilized for recording the "streets" in which infectious cases have occurred.

The tabulated information relative to infectious diseases on page 129 will be found useful.

The following clauses have reference to the prevention of infectious disease:—

"Where any suitable hospital or place for the reception of the sick is provided within the district or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder and is without proper lodging or accommodation, or lodged in a room occupied by more than one family or is on board any vessel . . . . on a certificate of a legally qualified medical practitioner, and with the consent of the superintending body of such hospital . . . . be removed by order of any justice to such hospital at the cost of the local authority, and any person so suffering who is lodged in a common lodging house, may, with like consent, be so removed by order of the local authority." (38 & 39 Vic., C. 55, S. 124).

The words "or lodged in a tent or van" are added in Sec. 66, Public Health (Lond.) Act, 1891.

"Any justice of the peace acting in and for the district of the local authority, upon proper cause shown to him, may make an order directing the detention in hospital at the cost of the local authority of any person suffering from any infectious disease, who is then in an hospital for infectious disease and would not on leaving such hospital be provided with lodging or accommodation in which proper precautions could be taken to prevent the spreading of the disorder by such person. Any order so to be made by any such justice may be limited

Disease.	Incubation.	Mode of Onset and Early Symptoms.	Rash Appears on	Character of Rash, &c.	Infectious for at least
Small-Pox.	12 days.	Onset rather sudden, with shivering, vomiting, drowsiness, pain in head and back. Sometimes convulsions occur.	3rd day.	Hard shotty red spots, turning to blisters in 2 or 3 days, and filling with matter about the 12th day.	Until the skin is quite clear.
Diphtheria.	2 to 7 days.	Onset gradual. Weakness, loss of colour and appetite, sore throat, cough and hoarseness often.	None.	Grey patches in mouth, on tongue, or back of throat.	3 weeks.
Scarlatina or Scarlet Fever.	24 hours to 5 days.	Onset sudden, with high fever, vomiting, hot burning skin, sore throat.	2nd day.	Tiny bright red points, making the skin look red all over; first seen on chest, thighs, and back.	6 weeks.
Typhus.	12 days.	Onset sudden, slight headache and malaise, rigors, frontal headache, lassitude, pain in back and limbs, high temperature.	4th or 5th day.	First dirty pink on the back, grouped together in patches, disappear on pressure, afterwards become darker colour and on pressure get paler.	3 weeks.
Enteric or Typhoid Fever.	14 to 21 days.	Onset very gradual, with weakness, fever at night, loss of appetite, drowsiness. Sometimes diarrhœa.	8th day and onwards.	A few rose-coloured spots, chiefly on body, and appearing in daily crops.	——
Rubeola or German Measles.	14 to 21 days.	Usually no symptoms before the rash appears. Sometimes weakness, sore throat, and pain in back of neck.	1st or 2nd day.	Red spots, raised; often in groups, first appearing on face, wrists, and ankles, and causing itching.	3 weeks.
Measles.	10 to 12 days.	Onset gradual, with symptoms of feverish cold, sneezing, watering of eyes and cough.	4th day.	Dull red spots, raised; forming groups and crescents, first appearing on face and about the roots of the hair.	3 weeks.
Whooping or Chin Cough.	7 to 14 days.	Onset gradual, with symptoms of feverish cold, and troublesome cough.	None.	Cough getting worse, and after a week, coming on in fits, chiefly at night-time.	4 weeks.
Mumps.	14 to 21 days.	Onset rather sudden, with chilliness, loss of appetite, and pain about the jaws and ears.	None.	Swelling below ears or under the jaws.	3 weeks.
Chicken-Pox.	13 to 16 days.	Usually none.	1st day.	Red spots, turning to blisters in a few hours and then drying up.	3 weeks.

to some specific time, but with full power to any justice to enlarge such time as often as may appear to him to be necessary. It shall be lawful for any officer of the local authority or inspector of police acting in the district, or for any officer of the hospital, on any such order being made to take all necessary measures and do all necessary acts for enforcing the execution thereof." (53 & 54 Vic., C. 34, S. 12, and 54 & 55 Vic., C. 76, S. 67).

"Where the medical officer of health of any local authority, or any other registered medical practitioner, certifies that the cleansing and disinfecting of any house, or part thereof, and of any articles therein likely to retain infection, would tend to prevent or check infectious disease, the *clerk to the local authority* shall give notice in writing to the owner or occupier of such house or part thereof that the same and any such articles therein will be cleansed and disinfected by the local authority at the cost of such owner or occupier, unless he informs the local authority within twenty-four hours from the receipt of the notice that he will cleanse and disinfect the house or part thereof and any such articles therein to the satisfaction of the medical officer of health, within a time fixed in the notice." (53 & 54 Vic., C. 72, S. 5).

In the Public Health (Lond.) Act, Section 60, after the words medical officer of health are added, *or any other legally qualified medical practitioner*, which leaves it to the person on whom the notice has been served to select his own medical practitioner.

"If, within twenty-four hours from the receipt of the notice, the person to whom the notice is given does not inform the local authority as aforesaid, or if, having so informed the local authority, he fails to have the house or part thereof and any such articles disinfected as aforesaid within the time fixed in the notice, the house or part thereof and articles shall be cleansed and disinfected by the officers of the local authority under the superintendance of the medical officer of health, and the expenses incurred may be recovered from the owner or occupier in a summary manner." (53 & 54 Vic., C. 34, S. 5, and 54 & 55 Vic., C. 76, S. 60, Sub-sec. 2).

The cost of disinfection under the Public Health

(Lond.) Act must be paid for by the sanitary authority in every case.

"Provided that where the owner or occupier of any such house or part thereof is unable in the opinion of the local authority, or of their medical officer of health, effectually to cleanse and disinfect such house or part thereof, and any article therein likely to retain infection, the same may without any such notice being given as aforesaid, but with the consent of such owner or occupier, be cleansed and disinfected by the officers of and at the cost of the local authority." (53 & 54 Vic., C. 34, S. 5).

"Any local authority, or the medical officer of health of any local authority generally empowered by the authority in that behalf, may by notice in writing require the owner of any bedding, clothing, or other articles which have been exposed to the infection of any infectious disease to cause the same to be delivered over to an officer of the local authority for removal for the purpose of disinfection; and any person who fails to comply with such a requirement shall be liable to a penalty not exceeding ten pounds.

The bedding, clothing, and articles shall be disinfected by the authority, and shall be brought back and delivered to the owner free of charge, and if any of them suffer any unnecessary damage the authority shall compensate the owner for the same and the amount of compensation shall be recoverable in, and in case of dispute shall be settled by, a court of summary jurisdiction." (53 & 54 Vic., C. 34, S. 6).

Under Section 61, Public Health (Lond.) Act, the notice must be given by the sanitary authority or a duly appointed committee as per Section 99, and not by the medical officer of health, as authorised in the above clause.

"Every person who shall cease to occupy any house, room, or part of a house in which any person has within six weeks previously been suffering from any infectious disease without having such house, room, or part of a house, and all articles therein liable to retain infection, disinfected to the satisfaction of a registered medical practitioner, as testified by a certificate signed by him, or without first

giving to the owner of such house, room, or part of a house, notice of the previous existence of such disease, and every person ceasing to occupy any house, room, or part of a house, and who on being questioned by the owner thereof, or by any person negotiating for the hire of such house, room or part of a house as to the fact of there having within six weeks previously been therein any person suffering from any infectious disease knowingly makes a false answer to such question shall be liable to a penalty not exceeding ten pounds." (53 & 54 Vic., C. 34, S. 7).

The words "or such articles destroyed" are added to Section 65, Public Health (Lond.) Act.

"No person without the sanction in writing of the medical officer of health or of a registered medical practitioner, shall retain unburied elsewhere than in a public mortuary or in a room not used at the time as a dwelling-place, sleeping-place, or workroom, for more than forty-eight hours, the body of any person who has died of any infectious disease." (53 & 54 Vic., C. 34, S. 8).

This section is the same as Section 72, Public Health (Lond.) Act, except that the words "public mortuary" have been omitted.

"If any person shall die of any infectious disease in any hospital or place of temporary accommodation for the sick, and the medical officer of health, or any other registered medical practitioner, certifies that in his opinion it is desirable, in order to prevent the risk of communicating any infectious disease or of spreading infection, that the body shall not be removed from such hospital or place except for the purpose of being forthwith buried, it shall not be lawful for any person or persons to remove such body from such hospital or place except for the last mentioned purpose; and when the body is taken out of such hospital for that purpose it shall be forthwith carried or taken direct to some cemetery or place of burial, and shall be forthwith there buried; and any person wilfully offending against this section shall be liable to a penalty not exceeding ten pounds. Nothing in this Act shall prevent the removal of any dead body from any hospital or temporary place of accommodation for the sick to any mortuary, and such mortuary shall, for the purposes of this section, be deemed part of such hospital or place as aforesaid." (53 & 54 Vic., C. 34, S. 9, and 54 & 55 Vic., C. 76, S. 73).

"Where the body of any person who has died from any infectious disease remains unburied elsewhere than in a mortuary or in a room not used at the time as a dwelling-place, sleeping-place, or workroom, for more than forty-eight hours after death without the sanction of the medical officer of health or of a registered medical practitioner, or where the dead body of any person is retained in any house or building so as to endanger the health of the inmates of such house or building, or of any adjoining or neighbouring house or building, any justice may, on the application of the medical officer of health, order the body to be removed at the cost of the local authority to any available mortuary, and direct the same to be buried within a time to be limited in the order; and any justice may, in the case of the body of any person who has died of any infectious disease, or in any case in which he shall consider immediate burial necessary, direct the body to be so buried. Unless the friends or relatives of the deceased undertake to bury and do bury the body within the time limited by such order, it shall be the duty of the relieving officer of the relief district from which the body has been removed to the mortuary, or in which the body shall be, if it has not been so removed, to bury such body, and any expense so incurred may be charged by the relieving officer in his accounts, and may be recovered by the board of guardians in a summary manner from any person legally liable to pay the expenses of such burial." (53 & 54 Vic., C. 34, S. 10, and 54 & 55 Vic., C. 76, S. 89).

See also Section 142, Public Health Act, 1875.

"Any person who hires or uses a public conveyance other than a hearse for the conveyance of the body of a person who has died from any infectious disease, without previously notifying to the owner or driver of such public conveyance that the person whose body is or is intended to be so conveyed has died from infectious disease, and after any such notification as aforesaid, any owner or driver of a public conveyance, other than a "hearse," which has been used for conveying the body of a person who has died from an infectious disease, who shall not immediately afterwards provide for the disinfection of such conveyance, shall be guilty of an offence under this Act." (53 & 54 Vic., C. 34, S. 11, also 54 & 55, C. 76, S. 74).

"Any person who shall knowingly cast, or cause or permit to be cast, into any ash-pit, ash-tub, or other receptacle for the deposit of

refuse matter any infectious rubbish without previous disinfection, shall be guilty of an offence under this Act." (53 & 54 Vic., C. 24, S. 13, and 54 & 55 Vic., C. 76, S. 62).

"Where sections seven and thirteen of this Act, or either of them, are in force in any district, the local authority shall give notice of the provisions thereof to the occupier of any house in which they are aware that there is a person suffering from an infectious disease." (53 & 54 Vic., C. 34, S. 14).

"The local authority shall from time to time provide, free of charge, temporary shelter or house accommodation with any necessary attendants for the members of any family in which any infectious disease has appeared, who have been compelled to leave their dwellings, for the purpose of enabling such dwellings to be disinfected by the local authority." (53 & 54 Vic., C. 34, S. 15, and 54 & 55 Vic., C. 76, S. 60).

"Every person who shall wilfully obstruct any duly authorised officer of the local authority in carrying out the provisions of this Act, or who shall obstruct the carrying out of an order made by a justice under this Act, or who shall offend against any enactment of this Act for the time being in force in any district by which no penalty is specifically imposed, shall be liable to a penalty not exceeding five pounds, and if the offence is a continuing one, to a daily penalty not exceeding forty shillings a day so long as the offence continues." (53 & 54 Vic., C. 34, S. 16, and 54 & 55 Vic., C. 76, S. 66, Sub-sec. 2).

"For the purpose of carrying into effect the provisions of section 5 of this Act the local authority may, by any officer appointed in that behalf, who shall produce his authority in writing, enter on any premises between the hours of ten o'clock of the forenoon and six o'clock of the afternoon." (53 & 54 Vic., C. 34, S. 17).

"Every penalty imposed by this Act shall be recoverable in a court of summary jurisdiction on the information or complaint of the local authority, or of their duly authorised officer, but not otherwise, and shall be paid to the local authority." (53 & 54 Vic., C. 34, S. 18).

"Any person who—

1. While suffering from any dangerous infectious disorder wilfully exposes himself without proper precautions against spreading the said disorder in any street, public place, shop, inn, or public conveyance, or enters any public conveyance without previously

notifying to the owner, conductor, or driver thereof that he is so suffering; or

2. Being in charge of any person so suffering, so exposes such sufferer; or
3. Gives, lends, sells, transmits or exposes, without previous disinfection, any bedding, clothing, rags, or other things, which have been exposed to infection from any such disorder,

shall be liable to a penalty not exceeding five pounds; and a person who, while suffering from any such disorder, enters any public conveyance without previously notifying to the owner or driver that he is so suffering, shall in addition be ordered by the court to pay such owner and driver the amount of any loss and expense they may incur in carrying into effect the provisions of this Act with respect to disinfection of the conveyance.

Provided that no proceedings under this section shall be taken against persons transmitting with proper precautions any bedding, clothing, rags, or other things for the purpose of having the same disinfected." (38 & 39 Vic., C. 55, S. 126, also 54 & 55 Vic., C. 76, S. 68).

" Every owner or driver of a public conveyance shall immediately provide for the disinfection of such conveyance after it has to his knowledge conveyed any person suffering from a dangerous infectious disorder; and if he fails to do so he shall be liable to a penalty not exceeding five pounds; but no such owner or driver shall be required to convey any person so suffering until he has been paid a sum sufficient to cover any loss or expense incurred by him in carrying into effect the provisions of this section." (38 & 39 Vic., C. 55, S. 127, and 54 & 55 Vic., C. 76, S. 70).

" Any person who knowingly lets for hire any house, room, or part of a house in which any person has been suffering from any dangerous infectious disorder, without having such house, room, or part of a house and all articles therein liable to retain infection, disinfected to the satisfaction of a legally qualified medical practitioner, as testified by a certificate signed by him, shall be liable to a penalty not exceeding twenty pounds." (38 & 39 Vic., C. 55, S. 128, and 54 & 55 Vic., C. 76, S. 63 & 64).

Patients not removed to an infectious hospital should be placed in a room which is so situated as to be quite isolated from the rest of the house, the topmost room in

the house being the best, and the person in attendance upon the patient should have no other duty to perform in the house.

When the patient has recovered of the disease, or, has been removed to the hospital, the house should be immediately disinfected in the following manner :—

All the crevices of the doors, windows and floors should be pasted over with paper ; chloride of lime (or bleaching powder), in the proportion of one pound to every 1000 cubic feet of space in the room, placed in a number of suitable receptacles located in different parts of the room to be disinfected, one of the receptacles being placed near to the ceiling, the operator should see that there are no living creatures in the room, he should then pour a few drops of strong hydrochloric or diluted sulphuric acid upon the chloride of lime and at once leave the room, closing the door and repeating the operation of pasting paper round the edges of the door and covering the key-hole. The room must then be left for, say, 5 or 6 hours at least, after which the windows should be thrown open for ventilation.

When the room to be disinfected contains valuable furniture or pictures, &c., chlorine gas ought not to be the agent for fumigating, as this would probably cause serious damage to furniture of this description, and to obviate this risk, the apartments should be fumigated with rolled or powdered sulphur, or with " caked " sulphur, the latter preparation is always handy, but the cost of this material is about three times that of the ordinary rolled or powdered sulphur.

The sulphur will require to be placed in iron pans or other similar receptacles in the same proportions as chloride of lime, and adopting the precautions as above referred to.

The sulphur may be started by adding a little methylated spirit and lighted with a match.

If there is no "stove" for disinfecting the bedding and clothing, all such articles should be thrown across lines fixed in the room to be disinfected, or in such a manner as will permit of the sulphur fumes or chlorine gas permeating the folds of the bedding and clothing to be disinfected.

Fumigation over, the wood-work of doors, floors and windows should be thoroughly washed and articles of furniture polished, the walls being stripped of its paper, and before it is repapered, the walls ought to be washed down with a solution of caustic soda, the wall paper, dust, &c., burned.

The following are the suggestions offered by the Society of Medical Officers of Health for preventing the spread of infectious disease:—

1. Separate the sick person from the rest of the family directly illness appears, placing him, if possible, in a room at the top of the house, and taking care to remove carpets, curtains, and all unnecessary articles of furniture and clothing therefrom.

2. Admit fresh air by opening the upper sash of the window. The fire place should be kept open, and fire lighted if the weather permits. Fresh air should be freely admitted through the whole house by means of open windows and doors. The more air that passes through the house, the less likely is the disease to spread.

3. Hang up a sheet outside the door of the sick room, and keep it wet with a mixture made either with a quarter of a pint of carbolic acid (No. 4), or a pound of chloride of lime, and a gallon of water. The floor should frequently be well sprinkled with either of the same disinfectants, and cloths, wetted with either, hung up in the room.

4. Everything that passes from the sick person should be received into vessels containing half a pint of solution of green copperas, made by dissolving one pound of the copperas in a gallon of water. A like quantity of the solution of copperas should be added to the discharges before emptying them into the closet.

5. Every sink, closet, or privy should have a quantity of one of the above named disinfectants poured into it daily, and the greatest care should be taken to prevent the contamination of well or drinking water by any discharges from the sick person.

6. All cups, glasses, spoons, &c., used by the sick person should be first washed in the above named solution of carbolic acid, and afterwards in hot water, before being used by any other person.

7. No article of food should be allowed to remain in the sick room. No food or drink that the sick person has tasted, or that has been in the sick room, should be given to anyone else.

8. All bed and body linen, as soon as removed from the sick person, and before being taken from the room, should be first put into a solution of carbolic acid of the above mentioned strength, remaining therein for at least an hour, and afterwards boiled in water.

9. Instead of handkerchiefs, small pieces of rag should be used, and these, when soiled, should be immediately burnt.

10. Persons attending on the sick should not wear woollen garments, as they are likely to retain infectious poison; dresses of cotton, or of some washable material, should be worn. Nurses should always wash their hands immediately after attending to the sick person, using carbolic acid soap instead of ordinary soap.

11. It is of the utmost importance that the sick room be not frequented by others than those in immediate attendance on the sick, as the clothing of visitors is very liable to carry away infection.

12. The scales and dusty powder, which peel from the skin in scarlet fever, and the crusts in small-pox, being highly infectious, their escape may be prevented by smearing the body of the sick person all over every day with camphorated oil. This, and the after use of warm baths, and carbolic acid soap are most essential. The sick person must not be allowed to mix with the rest of the family until the peeling has *entirely ceased*, and the skin is perfectly smooth; clothes used during the time of illness, or in any way exposed to infection *must not be worn again until they have been properly disinfected.*

13. When the sickness has terminated, the sick room and its contents should be disinfected and cleansed. This should be done in the following manner:—Spread out and hang upon lines all articles of clothing and bedding: well close the fire-place, windows, and all openings; then take a quarter to half a pound of brimstone, broken into small pieces; put them into a iron dish, supported over

a pail of water, and set fire to the brimstone, by putting some live coals upon it. Close the door, and stop all crevices, and allow the room to remain shut up for twenty-four hours. The room should then be freely ventilated, by opening the doors and windows, the ceiling should be white-washed, the paper stripped from the walls and burnt, and the furniture and all wood and painted work be well washed with soap and water containing a little chloride of lime. Beds, mattresses, and articles which cannot be well washed, should, if possible, be submitted to the action of heat in a disinfecting chamber, usually provided by the local authorities. *Until this process of disinfection is effectually carried out, the room cannot be safely occupied.*

14. Children should not be allowed to attend school from a house in which there is infectious disease, as, although not ill themselves, they are very likely to carry the infection, and so spread the disease. No child should be allowed to re-enter a school without a certificate from the medical attendant, stating that he can do so without any danger of infecting other children.

15. In case of death, the body should not be removed from the room, except for burial, unless taken to a mortuary, nor should any article be taken from it until disinfected as before directed in Rule No. 13. The body should be put into a coffin as soon as possible with a pound or two of carbolic powder. The coffin should be fastened down, and the body buried without any delay.

My previous remarks on the method of disinfection have had reference to those districts where there are no disinfecting machines or stoves, so far as bedding and clothing are concerned.

In districts where such machines have been provided it were better that all articles of clothing and bedding should be taken to the disinfecting station, and there disinfected at the required temperature and for the proper period in the stove, before being used again, and they are not on any account to be taken straight back to the room from which they were removed until disinfected, and unless such room has undergone fumigation and a thorough cleansing as before mentioned.

All articles of bedding and clothing should be carried to and from the disinfecting stove in closed vans—one van being set apart for "infected" goods, while the other is used entirely for goods "disinfected."

The work of disinfection should be carried out by men specially employed for that purpose, the disinfecting staff being under the supervision and direction of the Medical Officer and Sanitary Inspector.

The disinfection of bedding and clothing by heat (or steam) is a matter which Dr. Parsons has given great attention to, and he gives the following conclusions in his report to the Local Government Board for 1884, as the result of his very important experiments:—

1. With the exception of spore-bearing cultivations of the bacillus of anthrax all the infective materials experimented on were destroyed by exposure for one hour to dry heat of 220° F., or five minutes exposure to steam at 212° F. Spores of bacillus anthrax required for destruction four hours of exposure to dry heat of 220° F., or one hour's exposure to dry heat of 245° F. but were destroyed by five minutes exposure to a heat of 212° F. in steam or boiling water.

It may be assumed that the contagia of the ordinary infectious diseases of mankind are not likely to withstand exposure to an hour's dry heat of 220° F., or one of five minutes to boiling water or steam of 212° F.

2. Dry heat penetrates slowly into bulky or badly-conducting articles, as of bedding and clothing; the time commonly allowed for the disinfection of such articles being insufficient to allow an adequate degree of heat to penetrate into the interior. Steam penetrates far more rapidly than dry heat, and its penetration may be aided by employing it under pressure, the pressure being relaxed from time to time, so as to displace the cold air in the interstices of the material.

In hot air the penetration of heat is aided by the admixture of steam, so as to moisten the air, but hot moist air did not appear to have a greater destructive effect upon spores of anthrax bacilli than dry heat.

3. Scorching begins to occur at different temperatures with different materials, white wool being soonest affected. It is specially liable to occur where the heat is in the radiant form. To avoid risk of scorching the heat should not be allowed much to exceed 250° F., and even this temperature is too high for white woollen articles.

4. By a heat of 212° F. and upwards, whether dry or moist, many kinds of stains are fixed in fabrics so that they will not wash out. This is a serious obstacle in the way of the employment of heat for the disinfection previous to washing of linen, &c., soiled by the discharge of the sick.

5. Steam disinfection is inapplicable in the case of leather, or of articles which will not bear wetting. It causes a certain amount of shrinkage in textile materials, about as much as an ordinary washing. The wetting effect of the steam may be diminished by surrounding the chamber with a jacket containing steam at a higher pressure, so as to superheat the steam in the chamber.

6. For articles that will stand it, washing in boiling water (with due precaution against re-infection) may be relied on as an efficient means of disinfection. It is necessary, however, that before boiling the grosser dirt should be removed by a preliminary soaking in cold water. This should be done before the linen leaves the infected place.

7. The objects for which disinfection by dry heat or steam is especially applicable are such as will not bear boiling in water, *e.g.*, bedding, blankets, carpets, and cloth clothes generally.

8. The most important requisites of a good apparatus for disinfection by heat are (*a*) that the temperature in the interior shall be uniformly distributed; (*b*) that it shall be capable of being maintained constant for the time during which the operation extends; and (*c*) that there shall be some trustworthy indication to the actual temperature of the interior at any given moment. Unless these conditions be fulfilled, there is risk, on the one hand, that articles exposed to heat may be scorched, or on the other hand, that through anxiety to avoid such an accident the opposite error may be incurred, and that the articles may not be sufficiently heated to ensure their disinfection.

9. In dry-heat chambers the requirement (*a*) is often very far from being fulfilled, the temperature in different parts of the chamber varying sometimes as much as 100°. This is especially the case in apparatus heated by the direct application of heat to the floor or sides of the chamber. The distribution of temperature is more uniform in proportion as the source of heat is removed from the chamber, so that the latter is heated by currents of hot air rather than by radiation.

10. In chambers heated by gas, when once the required temperature has been attained, but little attention is necessary to maintain it uniform, and in the best made apparatus this is automatically performed by a thermo-regulator. On the other hand, in apparatus heated by coal or coke, the temperature continually tends to vary, and can only be maintained uniform by constant attention on the part of the stoker.

11. In very few hot-air chambers did the thermometer with which the apparatus was provided afford a trustworthy indication of the temperature of the interior; in some instances there was an error of as much as 100°

F. This is due to the thermometer, for reasons of

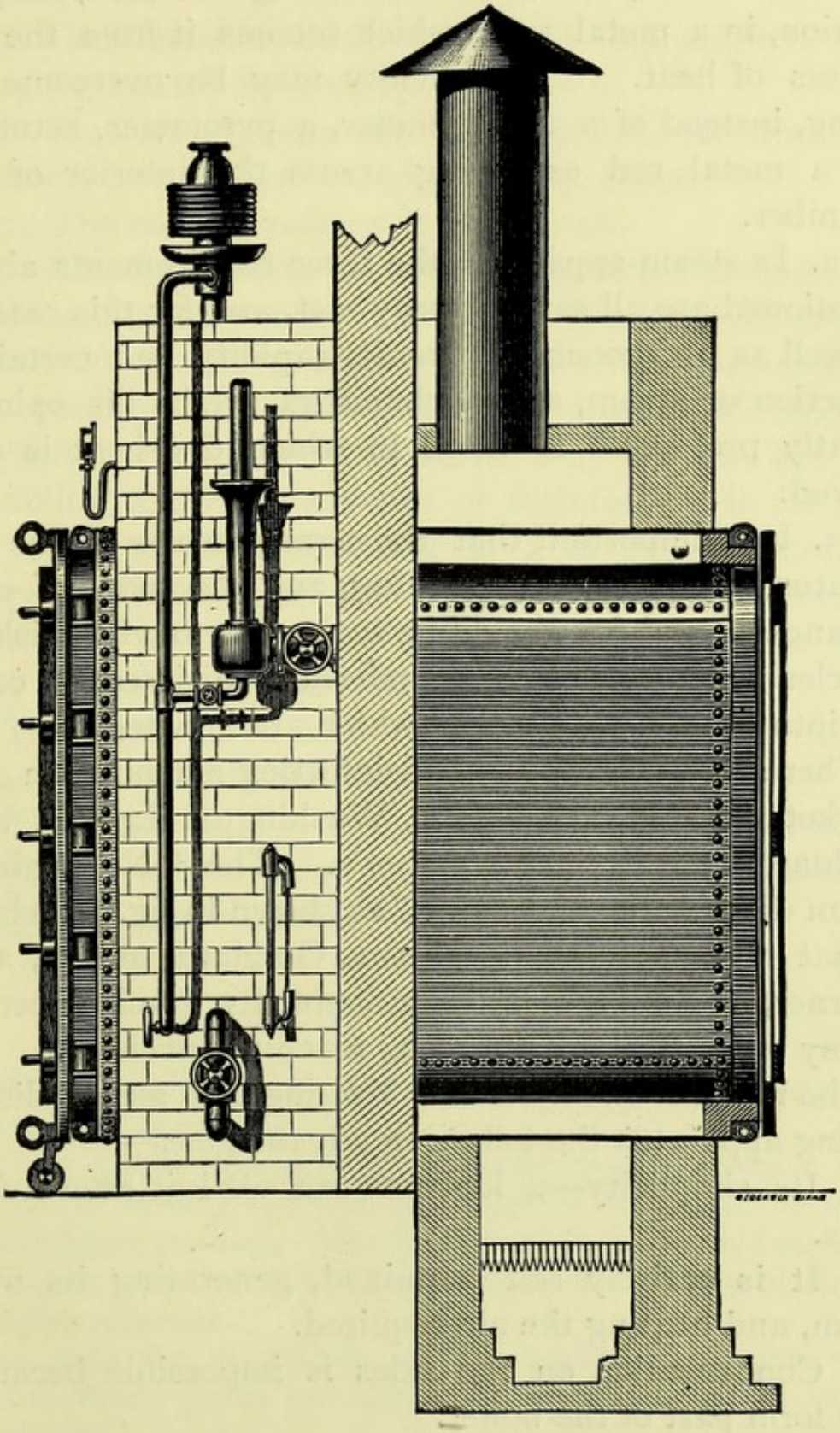


FIG. 45.—Nottingham steam disinfector.

safety and accessibility, being placed in the coolest part of the chamber, and to the bulb being enclosed, for protection, in a metal tube which screens it from the full access of heat. The difficulty may be overcome by using, instead of a thermometer, a pyrometer, actuated by a metal rod extending across the interior of the chamber.

12. In steam apparatus the three requirements above mentioned are all satisfactorily met, and for this reason, as well as on account of greater rapidity and certainty of action of steam, steam chambers are in his opinion greatly preferable to those in which dry heat is employed.

13. It is important that the arrangements of the apparatus, the method of working, and the mode of conveyance to and fro should be such as to obviate risk of articles which have been submitted to disinfection coming into contact with others which are infected.

There are several steam disinfecting machines in the market, notably, Bradford's, Washington Lyon's, and Goddard, Massey and Warner's. The "Nottingham steam disinfecting apparatus," as shown in fig. 45, which is that manufactured by Messrs. Goddard, Massey and Warner, of Nottingham, is undoubtedly much superior to any other steam disinfecting machine invented.

The makers claim for the Nottingham steam disinfecting apparatus the following advantages:—

1. Its simplicity—a labourer can work it after a few trials.

2. It is entirely self contained, generating its own steam, and heating the air required.

3. Condensation on the sides is impossible because they form part of the boiler.

4. Condensation on the end doors is also impossible

because they are made hollow, and connected to the boiler.

5. Condensation on the articles is impossible because they are heated by a current of hot air.

6. Hot air replaces the steam before the doors are opened, so no steam escapes into the room.

7. The cost of working is very small.

8. The first cost is less than other Steam Disinfectors.

This machine has two very important advantages over others used for similar purposes, viz.:—its capacity for holding large quantities of bedding, &c., and the rapidity with which the steam may be got up, thus enabling a greater amount of disinfecting to be done at one operation, resulting in a saving of time and expense, besides which it also permits the sanitary authority to return all articles disinfected the same day perfectly dry and ready for use.

The firm have also made a portable disinfecting machine suitable for rural districts.

The following list of duties for men employed in disinfecting, will be found useful as a guide to the sanitary inspector or the medical officer of health.

DUTIES OF THE DISINFECTOR.

To be on duty at 7 a.m., and to give his whole time to the work of the sanitary department.

To be directly responsible for the disinfection or destruction of all articles of bedding and clothing brought to the disinfecting station from infected premises. The disinfector is to follow the instructions given and posted up at the station as to the working of the disinfecting apparatus.

To keep the disinfecting station, machines, windows, walls, shelves, floors, gullies and traps, thoroughly clean and in orderly condition.

To go off duty under ordinary circumstances at 5.30 p.m. (Satur-

days at 2 p.m.), but to be liable to be called at any time. Meal hours 8 to 8.30 a.m., and 12 to 1 p.m.

To act generally under the direction and supervision of the medical officer of health and the sanitary inspector and to report to the latter officer any defects or requirements of the station from day to day.

He is not to absent himself from duty at any time, unless with the consent of the medical officer of health or the sanitary inspector.

DUTIES OF THE FIRST VAN MAN.

To be on duty at 7 a.m., and to devote the whole of his time to the work of the sanitary department.

To be directly responsible for the care and cleanliness of the bedding vans and coach houses, the fumigation of infected houses, and the removal of infected and disinfected bedding and clothing to and from the disinfecting station.

To give a receipt on the proper form for all articles received for disinfection to the owner or his representative, and in like manner to obtain a similar acknowledgment from the party receiving such articles after disinfection.

He must not while in charge of an infected vehicle go into any house of business or mingle with the public or otherwise do anything which might spread infection.

To assist the disinfector in keeping clean and orderly the disinfecting station, and to give general help to the second van man.

To drive at all times with caution.

To be off duty under ordinary circumstances at 5.30 p.m. (Saturday at 2 p.m.), but to be liable to be called at any time. Meal hours 8 to 8.30 a.m., and 12 to 1 p.m.

He shall keep a book in which to record all the bedding, clothing, &c., received for disinfection, and must report such information to the sanitary inspector at his office before 8 a.m. every Monday.

He is not to absent himself from duty at any time, unless with the consent of the medical officer of health or the sanitary inspector.

To act generally under the direction and supervision of the medical officer of health or the sanitary inspector.

DUTIES OF THE SECOND VAN MAN.

To be on duty at 7 a.m., and to devote the whole of his time to the work of the sanitary department.

To be directly responsible for the care and cleanliness of the horse employed in the work of disinfecting, the harness, stables and fittings connected therewith.

He must not while in charge of an infected vehicle go into any place of business or mingle with the public or otherwise do anything which might spread infection.

To assist the disinfector in keeping clean and orderly the disinfecting station, and to give general help to the first van man. To drive at all times with caution.

To be off duty under ordinary circumstances at 5.30 p.m. (Saturdays at 2 p.m.), but to be liable to be called at any time. Meal hours 8 to 8.30 a.m., and 12 to 1 p.m.

He is not to absent himself from duty at any time, unless with the consent of the medical officer of health or the sanitary inspector.

To act generally under the direction and supervision of the medical officer of health or the sanitary inspector.

The inspector is required to have some knowledge as to the various disinfectants in use, and for convenience I append a list of those most commonly used :—

Carbolic acid and powder.
Chloride of lime and chlorine gas.
Condy's fluid (permanganate of potash).
Terebene.
Sanitas fluid, oil, and powder.
Jeyes fluid and powder.
Sulphur or sulphurous acid gas.
Iodine.
Bromine.
Phenyl.
Corrosive sublimate.

The term "disinfectant" should be used only to designate the substances which can prevent the spread of infectious disease by destroying their specific poisons.

It, however, very often happens that the substances

which are recommended as disinfectants are little more than deodorants.

The choice of the disinfectants which the inspector may require for distribution from his department to the public, may be left to the medical officer of health.

VENTILATION AND MEASUREMENT OF CUBIC SPACE.

The ventilation of any apartment, whether, of dwellings, public buildings or workshops, depends on three conditions:—

1. The quality of the external air.

2. The quantity of air that can be admitted to the apartment, in a given time, including its mode of distribution.

3. Its freedom from any noxious ingredient developed by combustion, trade, business, or manufacture, the exhalations of men and animals, and from any other special cause.

The atmospheric air consists chiefly of oxygen and nitrogen, in the proportion of 209·6 of the former to 790·0 of the latter, and 0·4 of carbonic acid per 1000 volumes, accompanied by traces of watery vapour, ammonia, ozone and suspended matters.

The late Drs. Parkes and De Chaumont have shown that when the amount of carbonic acid (CO_2) in the air exceeds the standard of 0·6, the air becomes close and decidedly unpleasant, while each individual, by means of expired air, renders 3000 cubic feet of air impure in the space of one hour.

Oxygen of the air is that element upon which strength,

heat and life depend, while nitrogen is useful only to dilute and mix with oxygen, and it is in proportion as carbonic acid, produced by respiration and combustion, is present in the atmosphere, that we estimate its purity or otherwise.

It is obvious, therefore, that the quantity of air supplied to a room, in order to make it reasonably safe for occupation should be sufficient to remove all sensible impurity, so that a person coming from the external air shall perceive no trace of odour, or difference between the room and the outside air in point of freshness.

The amount of fresh air required to pass through a given air space in a fixed time, in order to maintain a certain degree of purity, should be equal to the total amount of air expired during that time; but this (3000 cubic feet per hour for each person) is far more than most people are able to obtain; for in the crowded rooms of the artizan class, the average entire space would probably be more often less than 300 cubic feet per head than 1000, as a matter of fact, the expense of larger or a greater number of smaller rooms, would be fatal to the chance of such an ideal standard being carried out, the question is not, however, what is likely to be done, but what ought to be done.

The Local Government Board recommend a minimum of 300 cubic feet of air space for each person above the age of ten years, two children under the age of ten years to be counted as one adult.

The object of ventilation is the removal of foul air and the supply of pure air, or in other words it means, the maintenance of the atmosphere in that condition of purity, temperature, movement and moisture, which is found to be most agreeable to its inhabitants and most conducive to their health and vigour.

The principles of ventilation may be classified as follows :—

1. Natural ventilation, produced by the external wind agency.

2. Ventilation by the operation of gravity or heat agency.

3. Ventilation by fans, pumps and blowers, or mechanical agency.

The forces at work in natural ventilation are diffusion and the action of the winds, and the diffusion of gases depends upon their density, whilst the great value of wind pressure in purifying the atmosphere is beyond question.

Pettenkofer and Roscoe have shown that diffusion occurs through brick and stone, and Pettenkofer believes that one of the evils of a newly built and damp house, is that diffusion cannot occur through its walls.

Ill-fitting doors and windows allow of the passage of a considerable quantity of air, and old plaster of walls and ceilings affords a ready instance of porosity, as will be observed by the blackened condition of the plaster through having acted like a filter.

The wind is a powerful ventilating agent, as with strong winds and storms all the foul air is dispersed, and the atmosphere becomes fresh and invigorating.

When the velocity reaches five or six feet per second, unless the air is warm, no one will bear it, and so it is excluded from a room as disagreeable and difficult of distribution, especially in small apartments.

The movement of air is constantly occurring, and a moving body sets in motion all the air in its vicinity, which cause alone assists greatly in ventilation.

The aspirating power of the wind in blowing across the top of a chimney causes an up current of air at right angles to itself.

The second method of ventilation is produced by artificially raising the specific gravity of the air by increasing its temperature. Heat, by expanding the air, makes it lighter, causing it to rise, which thus displaces and removes any given quantity; moreover, heat has great influence over the atmosphere, because as the air is expanded, there is less oxygen in the same volume, but as it contracts by cold, the oxygen is increased.

With a proper application of the mechanical agency as a means of ventilation, we become masters of the situation, as we are able to introduce fresh air into a room at any required rate of movement, while the quantity of air admitted is placed under easy and immediate control.

The introduction and extraction of air by mechanical means, in a manner sufficiently simple, automatic, and inexpensive, is a matter surrounded with considerable difficulties, and consequently this method of ventilation can only be adopted in large establishments or where the cost of mechanical contrivance is disregarded.

Provided the air space is large, it will be evident that the necessity for a frequent renewal of air will be less, and less the chances of a draught, should the air space be small, say 500 cubic feet, with a man in it who is to be provided with 3000 cubic feet of air every hour, the air could not be properly distributed before reaching the person, and a draught would consequently be felt. Increase the air space to 1000 cubic feet, and the problem would be much easier, for a small current of air mixing with a larger volume of air in the room is more easily broken up, while the occupant of the room being further removed from the inlet for fresh air, the movement is not nearly so perceptible.

This will depend in a great measure upon the rate of

movement at which the air can be made to enter the room, without the movement being noticeable or injurious.

The question turns in a great measure on the power of introducing fresh air without creating a draught. Dr. Parkes records the fact that Pettenkofer found that with perfect mechanical means a frequent change of air is possible, as by the use of a steam engine he ventilated an air space of 424 cubic feet with comfort, changing the air of the room six times in the hour.

If the renewal of air is carried on by what is termed "natural" ventilation, a change at the rate of six times in the hour could not be attempted. A change equal to three times in the hour is all that is practically attainable, and if this be correct, 1000 cubic feet should be the minimum allowance of the initial air space.

Provided there is means of warming and equable movement of the air, which is not always easy to get, there might be larger "inlets," and therefore easy distribution, and a smaller air space to begin with.

If the "inlets" are 48 square inches in area, the rate of movement through them to supply a space of 500 cubic feet with 3000 cubic feet of air per hour would be $2\frac{1}{2}$ feet per second, and if as should be the case with artificial ventilation, the "inlet" is 72 to 80 square inches in size, the rate of movement would only be a little over $1\frac{1}{2}$ cubic feet per second, which would be imperceptible even at the orifice.

According to Parkes, it is desirable that each "inlet" should not be larger than 48 to 60 square inches in area.

The air must be taken from a pure source, the entering air should if possible be of a temperature of about 60° F., the inlet tubes should be short and so constructed as to

be easily cleaned, otherwise dirt lodges and the air becomes impure.

The "inlets" should be small and numerous rather than large and single, this will give a more uniform distribution of air to every part. They should be conical (Ellison's air bricks) or trumpet-shaped, the wider opening being next to the room so that the air spreads out "fan" like. Externally they should be protected by a hood or other similar arrangement, so that the wind will be prevented from flowing too rapidly through them, as if the currents are strong, draughts are felt.

Valves should be provided to partially close the openings so as to regulate the in-coming air or the change of air will be too rapid. If the "inlets" are covered with wire gauze, &c., this should be frequently cleaned.

"Inlets" should not be placed too near "outlets" or the fresh air may at once escape; theoretically the position of an "inlet" is at the floor level, but this cannot be strictly carried out, as the admission of cold air at such a level would cause great discomfort to the occupants of the room by chilling the feet.

When measuring the cubic space of a room, a lofty ceiling must not be made to compensate for a deficiency of floor space, as the impurities produced by respiration collect round about the persons who have evolved them. The maximum height of a room to be calculated upon may be taken at 12 feet.

The minimum of floor space to be insisted upon in all cases must not be less than $\frac{1}{12}$ of the cubic space.

Many people imagine, that cubic space may take the place of change of air, or in other words, if a larger cubic space be given, a change of air may be dispensed with, or less fresh air be required. This is quite erroneous, even the largest space can only provide suf-

ficient air for a limited time, after which the same amount of fresh air must be supplied hourly, whether the space be large or small.

This is shown by the following table prepared by the late Dr. F. de Chaumont:—

Table showing the degree of contamination of the air (in terms of CO_2) by respiration and the amount of air necessary to dilute to a given standard of 0·2 *per* 1000 *volumes of air, exclusive of the original amount present in the air.*

Amount of Cubic Space (= Breathing Space) for One Man in Cubic Feet.	Ratio per 1000 of CO_2 from Respiration at the end of one Hour if there has been no Change of Air.	Amount of Air Necessary to Dilute the Standard 0·2 during the First Hour.	Amount Necessary to Dilute to the given Standard every Hour after the first.
100	6·00	2900	3000
200	3·00	2800	3000
300	2·00	2700	3000
400	1·50	2600	3000
500	1·20	2500	3000
600	1·00	2400	3000
700	0·86	2300	3000
800	0·75	2200	3000
900	0·67	2100	3000
1000	0·60	2000	3000

The fresh air admitted to a room may be warmed in various ways:—

1. By passing it through a box containing coils of hot water or steam pipes.

2. The air may be admitted into air chambers behind or round grates or stoves, and thus be warmed. The first method recommended is considered the best.

If the air cannot be warmed it must be admitted at the bottom of the room, and carried some three or more

feet above the floor level and directed towards the ceiling, so as to pass up and then fall, and mix gradually with the air of the room.

In changing the air of a room the vitiated air should always be extracted from the highest point, and fresh air admitted in a vertical direction above the level of the head (Boyle).

Fresh air may be introduced into a room by means of

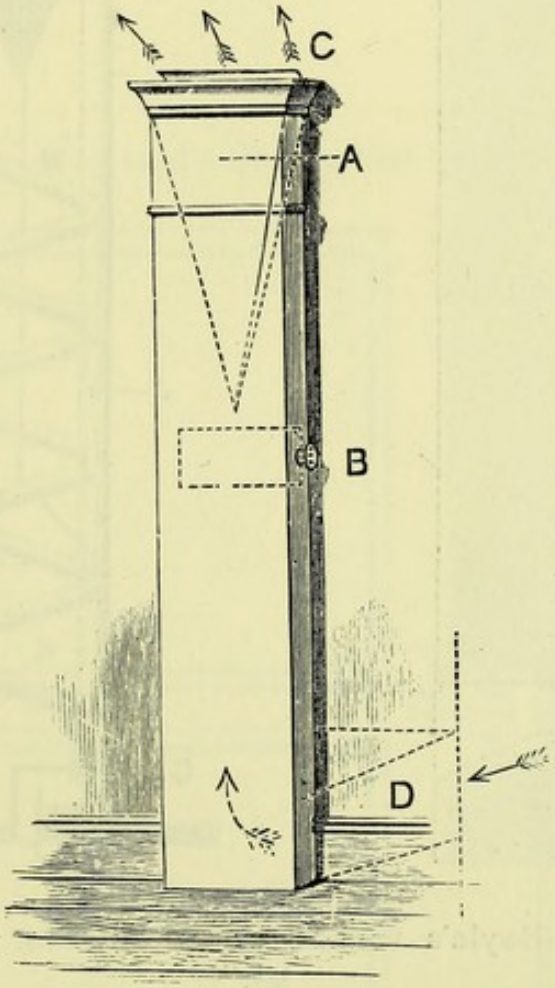
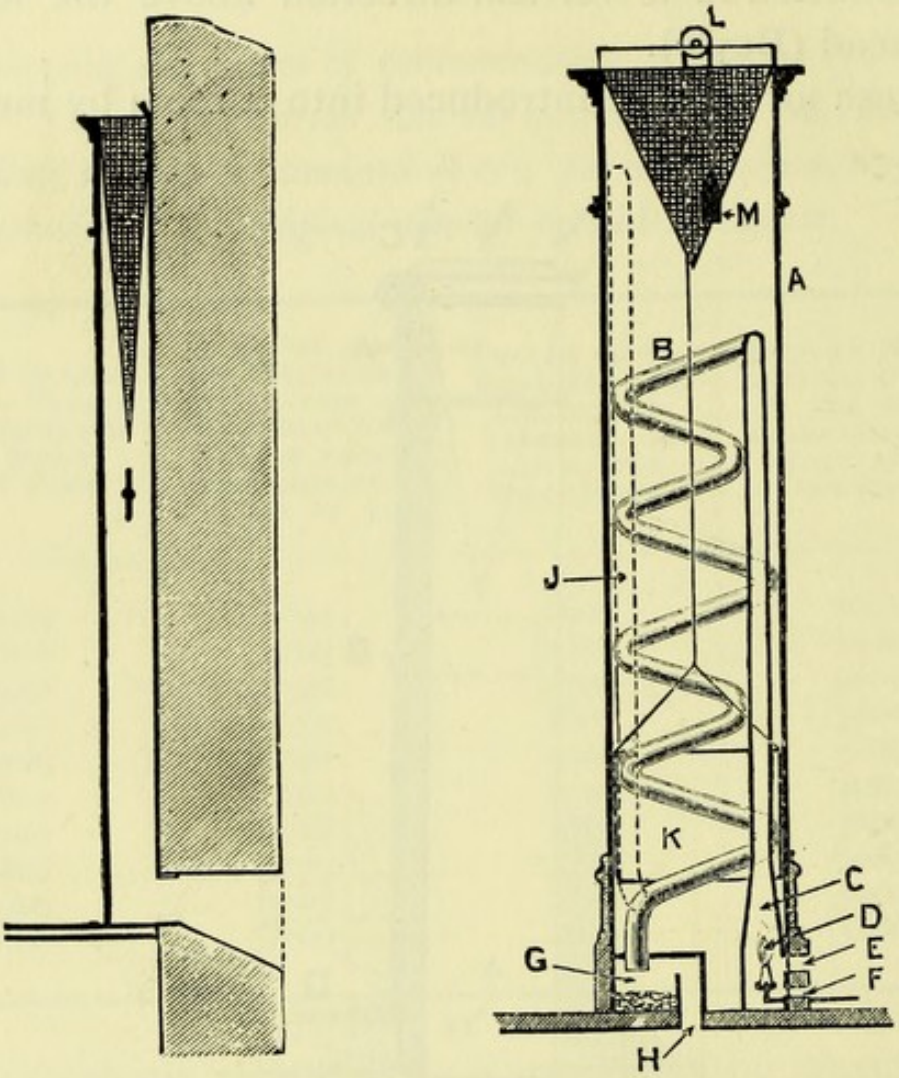


FIG. 47.—Boyle's (Tobin's) vertical tube inlet—view from room.

vertical tubes, as shown in figs. 47, 48 and 49, this gives an upward current which is retained for several feet before it begins to spread and descend; with variable winds, however, the results may be reversed.

The "Sheringham" valve, as shown in fig. 50, is a capital contrivance for the admission of fresh air—the air passes from the exterior through an air brick, and is then directed upwards by the valve opening which can be easily regulated by means of a balanced weight—



FIGS. 48 & 49.—Boyle's vertical tubes—entering air heated by gas jet.

these valves are usually fixed near the ceiling and very little draught is perceived from them, unless with high winds. These inlets are considered the best of their kind.

The window may be used as an inlet for fresh air by adopting what is known as the "Hinckes-Bird method"

(fig. 51), which is simply to place a piece of wood 3 or 4

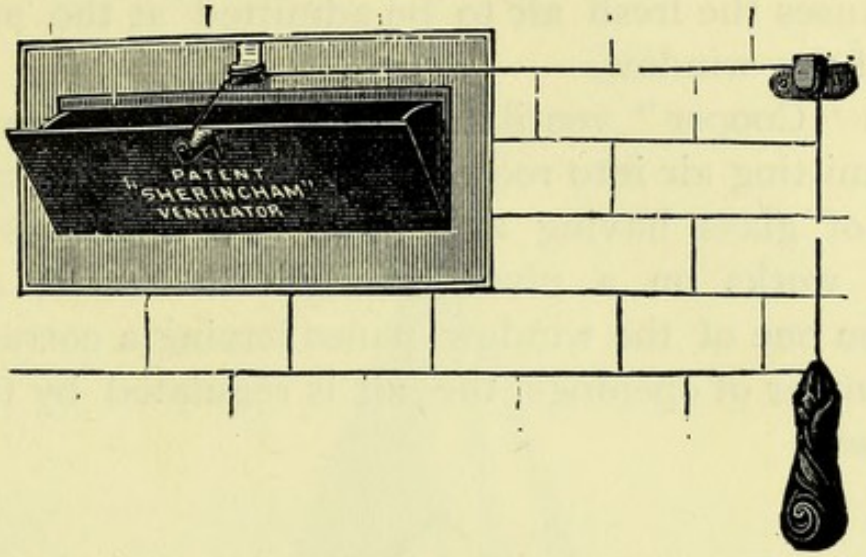


FIG. 50.—Hayward's Sheringham valve ventilator.

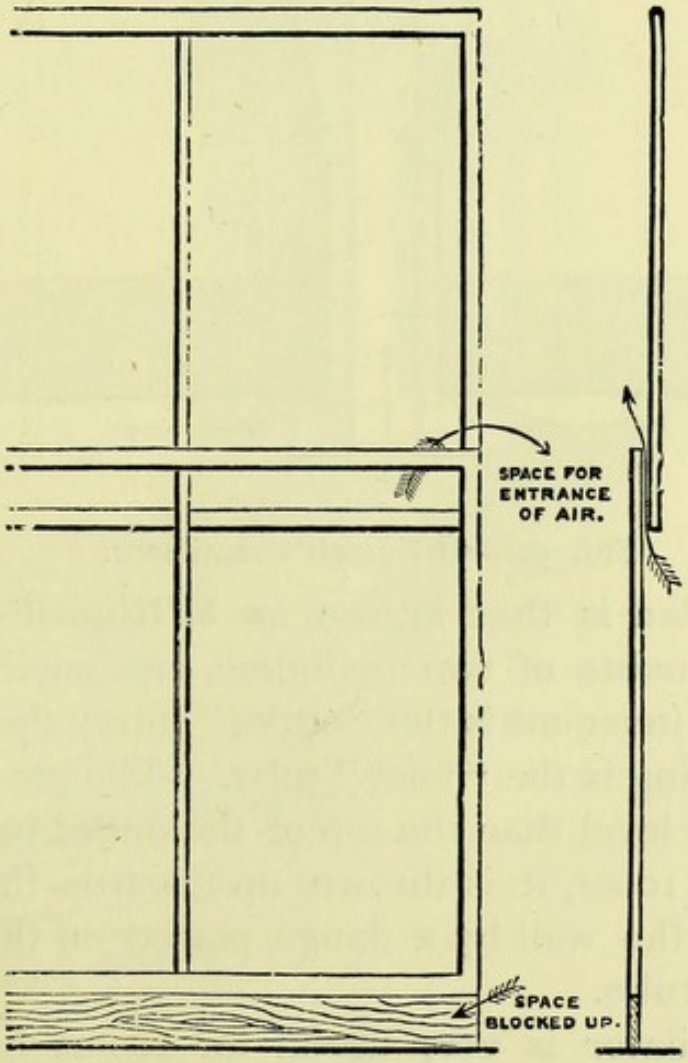


FIG. 51.—Hinckes-Bird's plan of window ventilation.

inches in depth under the bottom rail of a sash-window, this causes the fresh air to be admitted at the meeting rails of the window.

The "Cooper" ventilator is another useful invention for admitting air into rooms, and consists of a circular piece of glass having as a rule five apertures in it, which works on a pivot through its centre, and is fixed on one of the window panes having a corresponding number of openings, the air is regulated by turning the disc.

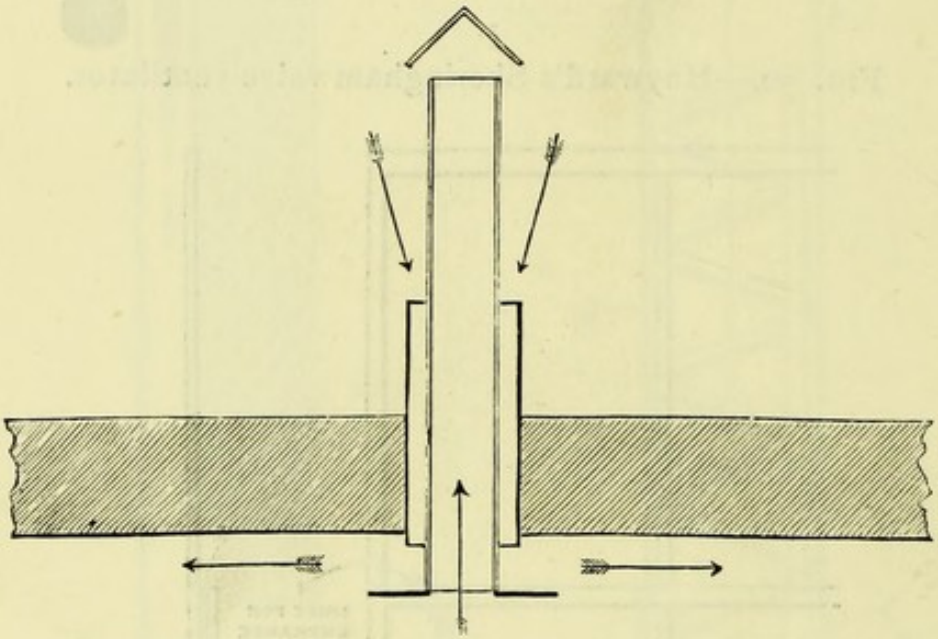


FIG. 52.—M'Kinnell's ventilator.

Another plan is that known as M'Kinnell's circular tube. It consists of two cylinders, one encircling the other. The inner one is the "outlet" tube; the "outer" cylinder or ring is the "inlet" tube. The air is drawn in at a lower level than the top of the outlet tube, when it enters the room, it is thrown up towards the ceiling, and then to the wall by a flange placed on the bottom of the inner tube.

This ventilator is very useful for rooms having no external walls, or in the case of underground rooms.

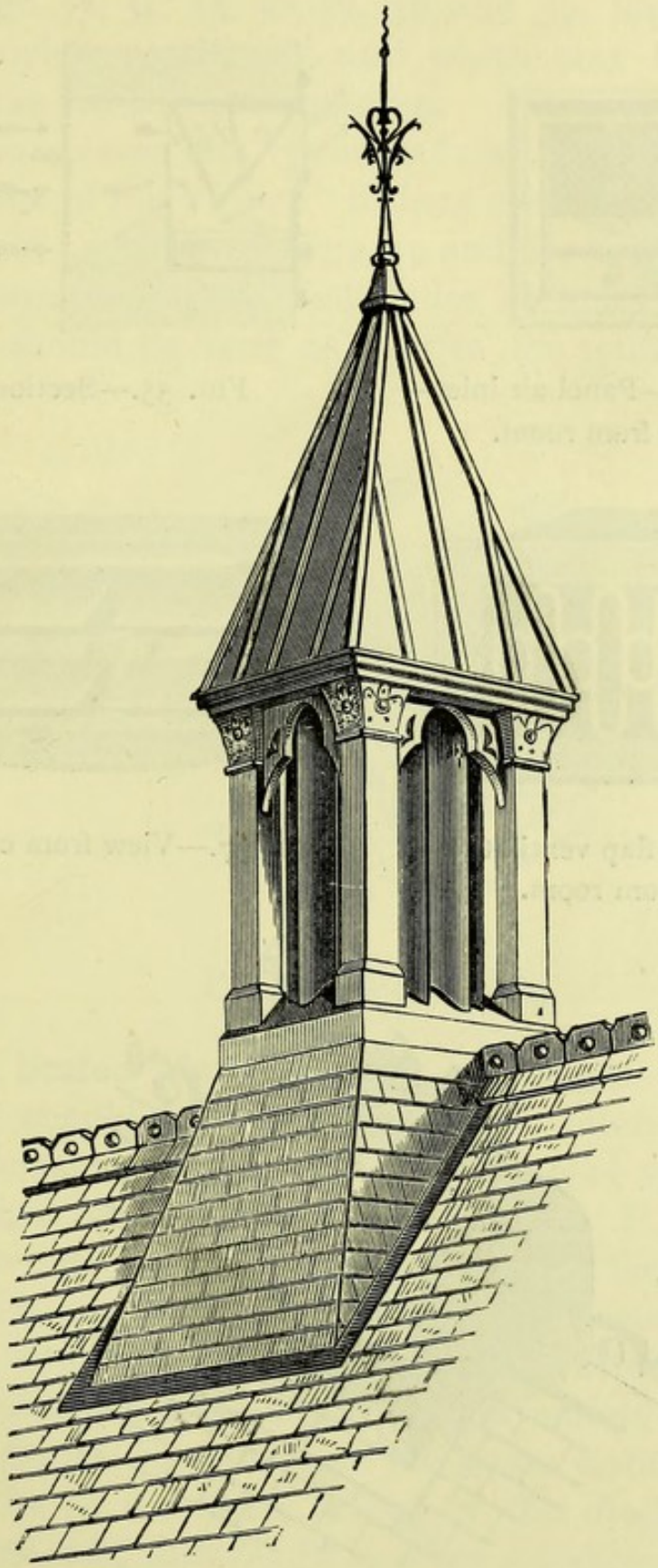


FIG. 53.—Boyle's air pump ridge ventilator.

FIG. 54.—Panel air inlet—view from room.

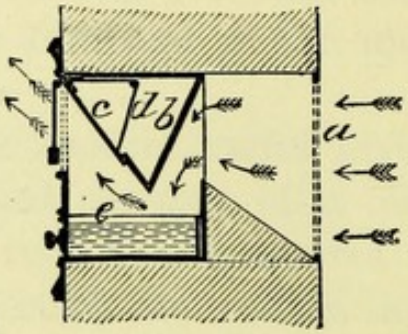


FIG. 55.—Section.

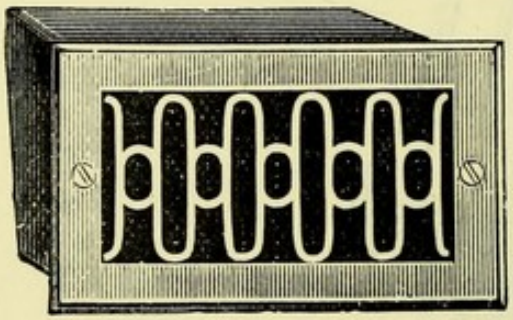


FIG. 56.—Mica flap ventilator—view from room.

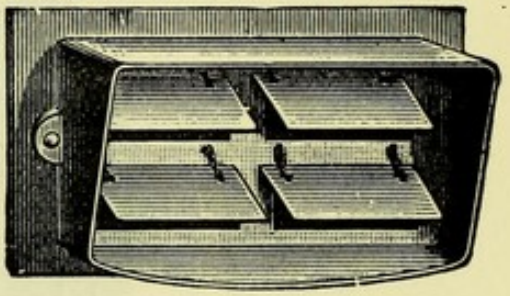


FIG. 57.—View from chimney.

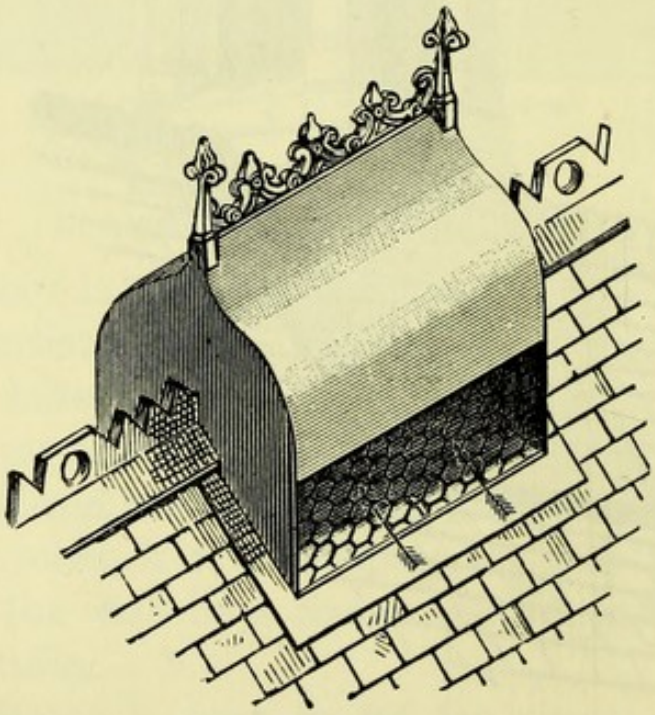


FIG. 58.—Elevation of a ridge ventilator.

Figs. 53, 54, 55, 56, 57, 58 and 59, illustrate several of Boyle's ventilators, and which may be adapted to suit the varied circumstances.

The places for "outlets" will depend upon the position of the "inlets" if there are facilities for heating the air, as shown in figs. 49 and 60, they may be fixed at almost any point, but under ordinary circumstances they should be fixed as near to the ceilings as practicable.

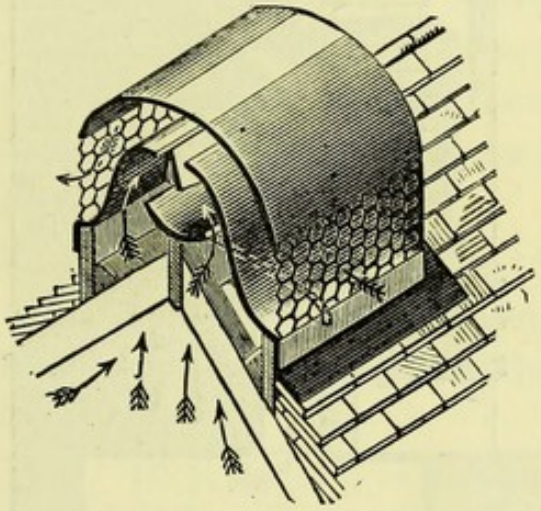


FIG. 59.—Section of fig. 58.

As heated air expands, it is thought that the "outlets" should be larger than the "inlets" but as the difference in volume, due to change of temperature, is so slight, even if the difference is 30° F., a cubic foot of air only becomes 1·061 cubic feet, which is equal to an increase of about $\frac{1}{17}$, it may be neglected, and the inlets and outlets can be made of the same size.

In case there should be several outlets in one room, they should commence at the same distance from the floor, be of the same height, or the discharge will be unequal, and they ought to have a corresponding share of exposure to the sun and winds.

The following rules should be observed as regards the ventilation of rooms, viz. :—to have the fresh air pure, to distribute it properly, and to adopt such means as may be necessary for securing the "outlets" from cold

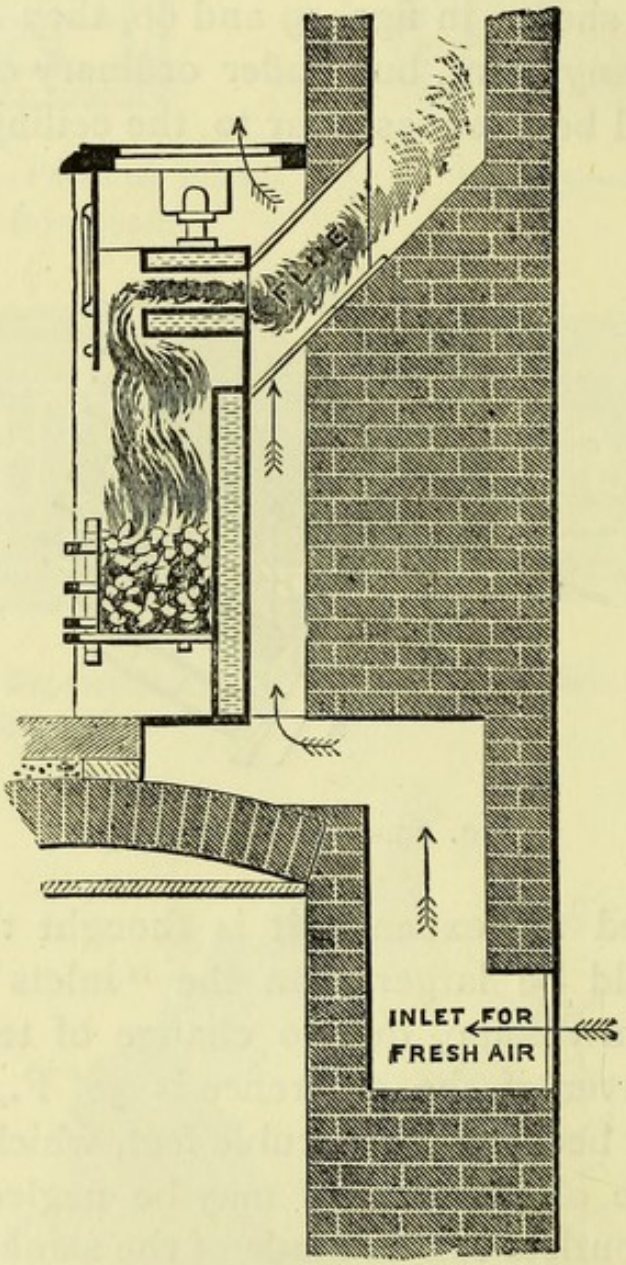


FIG. 60.

or ensuring that they are artificially warmed, and for distributing the air, which, with every precaution will occasionally pass down them.

MEASUREMENT OF CUBIC SPACE.

The inspector should have a fair knowledge of mensuration so as to be able to ascertain the cubical contents of rooms in suspected cases of over-crowding, the registration of houses let in lodgings, of common lodging houses and for other purposes.

With square and rectangular shaped rooms the task will be a simple matter, but it frequently happens that some portions of a room, such as a window, take different forms, and hence it becomes necessary to know the rules of measurement which will assist the officer under varying circumstances.

To ascertain the cubical contents of a square or rectangular shaped room, you multiply the length, breadth and height together, and the result is the number of cubic feet, for example :—

$$12 \times 10 \times 9 = 1080 \text{ cubic feet.}$$

$$\begin{array}{r} 10 \\ \hline 120 \\ 9 \\ \hline 1080 \\ \hline \end{array}$$

The 1080 cubic feet divided by 300 the "minimum" amount of air space recommended by the Local Government Board for common lodging houses would admit of three adult persons and one "child under 10 years" of age occupying such a room, the balance of air space, 30 cubic feet, should be retained to cover loss of air space by furniture, &c.

The following rules of mensuration will be of service :—

Circumference of circle	= Diameter × 3·1416 or by $3\frac{1}{7}$
Area of circle	= Square of diameter × 0·7854.
Area of segment of circle	= Divide cube of rise by twice the chord and "add" to the result $\frac{2}{3}$ of chord "multiplied" by rise.
Area of ellipse	= Product of two diameters × 0·7854.
Solidity of cone	= Area of base × one-third perpendicular height.
Solidity of globe	= Cube of diameter × 0·5236.
Surface of globe	= Square of diameter × 3·1416.
Area of triangle	= $\frac{1}{2}$ product of base and altitude will be the area.
Area of regular polygon	= Multiply the perimeter or some of the sides by the perpendicular drawn from the centre to one of the sides, and half the product will be the area; or multiply square of the side by the corresponding tabular area or multiplier opposite the name in the following table, and the product will be the area.

No of Sides.	Names.	Area of Multipliers.
3	Trigon	0·4330127
4	Tetragon	1·0000000
5	Pentagon	1·7204774
6	Hexagon	2·5980762
7	Heptagon	3·6339124
8	Octagon	4·8284271
9	Nonagon	6·1818242
10	Decagon	7·6942088
11	Undecagon	9·3656399
12	Duodecagon	11·1961524

A man of average size will take the place of about three cubic feet.

A mattress, a pillow, three blankets, one coverlet, and two sheets of a soldiers bed are said to occupy about 10 cubic feet, when folded together loosely.

All projections, solid pieces of furniture, cupboards, &c., should be measured and their cubical contents deducted from the gross measurements.

MEAT INSPECTION.

As the sanitary inspector is required to keep a strict watch over the food supply of his district, unless as is the case in some towns, an inspector is specially appointed for that work; it is necessary that he should make himself thoroughly acquainted with the diseases of animals which render the meat unfit for human food after the animal has been slaughtered and deposited in the slaughter-house or shop; also as regards fish and other foods, solid or liquid, whether exposed for sale, or in preparation for sale, or deposited for the purpose of sale, and intended for the food of man.

The following clauses relate to the powers of the inspector and medical officer of health, as to the seizure or otherwise of unsound food:—

"Any medical officer of health or inspector of nuisances may at all reasonable times inspect and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged; and if any such animal carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk, appears to such medical officer

or inspector to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a justice." (38 & 39 Vic., C. 55, S. 116).

"If it appears to the justice that any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk, so seized is diseased or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs or did belong at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding twenty pounds for every animal, carcase, or fish, or piece of meat, flesh, or fish, or any poultry or game, or for the parcel of fruit, vegetables, corn, bread, or flour or for the milk so condemned, or, at the discretion of the justice, without the infliction of a fine, to imprisonment for a term of not more than three months."

"The justice who, under this section, is empowered to convict the offender may be either the justice who may have ordered the article to be disposed of or destroyed, or any other justice having jurisdiction in the place." (38 & 39 Vic., C. 55, S. 117).

"Any person who in any manner prevents any medical officer of health or inspector of nuisances from entering any premises and inspecting any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetable, corn, bread, flour, or milk exposed or deposited for the purpose of sale, or of preparation for sale, and intended for the food of man, or who obstructs or impedes any such medical officer or inspector or his assistant, when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding five pounds." (38 & 39 Vic., C. 55, S. 118).

"On complaint on oath by medical officer of health or an inspector of nuisances or "other" officer of a local authority any justice may grant a warrant to any such officer, to enter any building or part of a building in which such officer has reason for believing that there is kept or concealed, any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk, which is intended for sale for the food of man, and is diseased, unsound, unwholesome or unfit for the food of man; and to search for, seize and carry away any such animal or other article in order to have the same dealt with by a justice under the provisions of this Act."

"Any person who obstructs any such officer in the performance of his duty if under such warrant shall, in "addition" to any other punishment to which he may be subject, be liable to a penalty not exceeding twenty pounds." (38 & 39 Vic., C. 55, S. 119).

"Sections one hundred and sixteen to one hundred and nineteen of the Public Health Act, 1875 (relating to unsound meat), shall extend and apply to all articles intended for the food of man, "sold" or exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale within the district of any local authority."

"A justice may condemn any such article, and order it to be destroyed or disposed of, as mentioned in section one hundred and seventeen of the Public Health Act, 1875, if satisfied on complaint being made to him that such article is diseased, unsound, unwholesome, or unfit for the food of man, although the same has not been seized" as mentioned in section one hundred and sixteen of the said Act." (53 & 54 Vic., C. 59, S. 28).

"Any medical officer of health or sanitary inspector may at all reasonable times enter any premises and inspect and examine:

(*a*) any animal intended for the food of man which is exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and

(*b*) any article, whether solid or liquid, intended for the food of man, and sold or exposed for sale or deposited in any place for the purpose of sale or of preparation for sale,

the proof that the same was not exposed or deposited for any such purpose or was not intended for the food of man, resting with the person charged; and if any such animal or article appears to such medical officer or inspector to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a justice."

"If it appears to a justice that any animal or article which has been seized or is liable to be seized under this section is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs or did belong at the time of sale or exposure for sale, or deposit for the purpose of sale or of preparation for sale, or in whose possession or on whose premises the same was found, shall be liable on summary conviction

to a fine not exceeding fifty pounds for every animal, or article, or if the article consists of fruit, vegetables, corn, bread, or flour, for every parcel thereof, so condemned, or, at the discretion of the court, without the infliction of a fine, to imprisonment for a term of not more than six months with or without hard labour."

"Where it is shown that any article liable to be seized under this section, and found in the possession of any person was purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned under this section, the person who so sold the same shall be liable to the fine and imprisonment above mentioned, unless he proves that at the time he sold the said article he did not know, and had no reason to believe, that it was in such condition."

"Where a person convicted of an offence under this section has been within twelve months previously convicted of an offence under this section, the court may, if it thinks fit, and finds that he knowingly and wilfully committed both such offences, order that a notice of the facts be affixed, in such form and manner, and for such period not exceeding twenty-one days, as the court may order, to any premises occupied by that person, and that the person do pay the costs of such affixing; and if any person obstructs the affixing of such notice, or removes, defaces, or conceals the notice while affixed during the said period, he shall for each offence be liable to a fine not exceeding five pounds."

"If the occupier of a licensed slaughter-house is convicted of an offence under this section, the court convicting him may cancel the licence for such slaughter-house."

"If any person obstructs an officer in the performance of his duty under any warrant for entry into any premises granted by a justice in pursuance of this Act for the purposes of this section, he shall, if the court is satisfied that he obstructed with intent to prevent the discovery of an offence against this section, or has within twelve months previously been convicted of such obstruction, be liable to imprisonment for any term not exceeding one month in lieu of any fine authorised by this Act for such obstruction."

"A justice may act in adjudicating on an offender under this section, whether he has or has not acted in ordering the animal or article to be destroyed or disposed of.

"Where a person has in his possession any article which is unsound, or unwholesome, or unfit for the food of man, he may, by

written notice to the sanitary authority specifying such article, and containing sufficient identification of it, request its removal, and the sanitary authority shall cause it to be removed, as if it were "trade refuse." (54 & 55 Vic., C. 76, S. 47).

This last part of the clause will take away the ground of a common defence in prosecutions for having unsound meat in one's possession. It being very often suggested that the food seized had been set aside with the object of destroying it, or to await the inspector's visit for inspection before offering the article for sale.

But as the officer is appointed for public purposes, and not to assist the dealer in deciding whether such food is fit for sale, the latter being quite competent to judge for himself, it follows that should the article be deposited in a market or shop for instance, or where sales of such commodities are usually carried on, it is the duty of the inspector to take possession of any food which he believes to be diseased or unsound, and which is intended for the food of man, with a view to its being taken before a justice or not, as "seizures now are unnecessary."

By section 116 of the Public Health Act, 1875, articles which are "exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale," may be seized, but in the case of Vinter *v.* Hind, 10 Q. B. D. 63, it was decided that a seizure made after sale, was not within the section. The defendant slaughtered a cow which had had milk fever, and sold several portions of it for the food of man. One of the purchasers handed the meat to Vinter, who was inspector of nuisances for the district. Vinter had it destroyed by order of a magistrate, and then sought to convict Hind of an offence under the section, and it was held that Vinter had no power to seize it *after sale*, although it was intended for the food

of man ; whereas, to come within the section it must be both exposed for sale and intended for the food of man. This decision was undoubtedly in accordance with the wording of the section, but it clearly exposed a defect in its working which hampers a local authority in its endeavour to maintain the good health of its district. The Public Health Act Amendment Act, 1890, and the Public Health (London) Act, 1891, removes this defect, and provides that the section shall apply in such a case as that of Vinter *v.* Hind, and gives an inspector power to inspect any article of food, even after sale, and take the same proceedings if he find it to be diseased, &c., as if he had found it exposed for sale at the time of his inspection.

With regard to the 117th section, 38 & 39 Vic., C. 55, it was formerly considered that if the magistrate once made an order for the destruction of the meat, the defendant could not in a prosecution under this section call evidence for the purpose of showing that the meat which had been condemned was not in fact unsound, and that view was supported by a dictum of Justice Stephen in the case of Vinter *v.* Hind, but this dictum was expressly overruled in the case of Waye *v.* Thompson, 15 Q. B. D. 342, on the ground that it is necessary that a man should be heard upon the question in a case where he is subjected to the liability to imprisonment, and therefore an inspector has not only to satisfy the magistrate who makes the order for destruction that the meat is unsound, but he must also be prepared to establish the fact when the case comes to be fought in open court. The difficulty of establishing a case is often increased by the erroneous idea that it is necessary to establish that the meat is unfit for the food of man. For instance, in the book of

Forms of Orders for Destruction that is published by one well-known firm, the publishers have inserted the words "and unfit for the food of man," in addition to the words "diseased or unsound or unwholesome," which are left to be filled in according to the circumstances, and summonses nearly always contain the words "and unfit for the food of man." All this increases the difficulties unnecessarily. Nothing could be more dangerous as a rule than these words, and I have found by experience that it is wiser to leave out the words "unfit for the food of man," and simply allege that the meat is either diseased or unsound, as the case may be. It is usually a comparatively easy thing to prove that a piece of meat is diseased, but I never knew a case yet where the defence were not prepared to produce evidence that the meat in question was not "unfit for the food of man." For instance, take a case of tuberculosis, of which I have had several. It will be remembered that in the Glasgow case many eminent medical men and veterinary surgeons were called for the defence to prove that the meat was not unfit for the food of man. In the first case of tuberculosis I had, the summons as issued alleged as usual that the meat was unfit for the food of man. There was no intention of fighting the Glasgow case over again, which on that summons it would have been quite competent for the defence to have compelled us to do, so a fresh summons was issued simply alleging that the meat seized was diseased, and the learned counsel who appeared for the defence admitted that on the second summons as worded he could do nothing but plead in mitigation of penalty.

An interesting question arises as to the person against whom you may proceed. The words in the section are "the person to whom the same belongs or did belong

at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty," &c. The case of Newton *v.* Monckom, 58 L. T. N. S. 231, was decided on this point. There the under bailiff of a large landowner (who had two cows slaughtered because they were affected by disease), was sent to Portsmouth to arrange with a butcher to take the carcases. The under bailiff sent the carcases in his own name consigned to the butcher at Portsmouth station. The butcher examined the carcases and stated to the under bailiff that they were of no use to him. The meat was seized while lying at the station and condemned, and proceedings were taken against the under bailiff "as being the person to whom the same belonged," and he was convicted. Against this conviction he appealed, and appealed successfully, for it was held that although he might have been convicted as being the person "in whose possession the same was found," the evidence showed that he was not the person "to whom the same belonged" at the time of exposure for sale. The judgment of Justice Smith, in that case was remarkable. He said, "it seems to me that two classes of persons may be convicted under section 117, namely, the person to whom the meat belonged, and the person in whose possession or on whose premises it was found." The statement was not necessary for the decision of the case before him, and therefore is not a binding statement of the law. But if it is correct it means that if you convict the person in whose possession the meat is found, you cannot afterwards convict the person on whose premises the same was found. Curiously enough, I had a case in which this very point arose. A man, J. Brown, was caught in the act of dressing a heifer in the

slaughter-house of one Thomas Smith, the heifer was found to be very badly affected by tuberculosis, and was accordingly seized. Proceedings were taken against Brown as being the person in whose possession the carcase was found, and also against Smith as being the person on whose premises the same was found. Brown was convicted and sentenced to imprisonment; Smith's case then came on, and the point was raised whether he could be convicted or not, seeing that Brown had already been convicted. It was contended that on the words in the section three persons could be convicted. (1) The person to whom the same belongs or did belong at the time of exposure for sale. (2) The person in whose possession the same was found. (3) The person on whose premises the same was found. The case was adjourned for a week to enable the magistrate's clerk to consider the case. In the meantime the facts were submitted by a person interested to the *Justice of the Peace* newspaper, and they gave an opinion against the contention, and relied on the dictum of Justice Smith to which I have referred; but a case was submitted for the opinion of one of the leading Junior Counsel on the Northern Circuit, and he advised that the whole three persons could be convicted. When the case came on again, the clerk to the magistrates gave an opinion in our favour.

The point is so interesting, and at the same time so important that before long it will no doubt come before the High Court for consideration.

In a Scotch case (Dickson *v.* Linton, 15 Ct. of Sess., 4th series, J. C. 76), it has been decided that in order to obtain a conviction against the occupier of premises for having unsound meat on his premises, it is not essential to prove that the accused knew either of the meat being

on his premises or of its unsound condition, and this view is supported by the judgments in the English case of Mallinson *v.* Carr (1891) 1 Q., B. 48.

Under the provisions relating to unsound food, &c, it is provided that "the inspector of nuisances may at all reasonable times inspect meat, &c., exposed for sale or deposited in any place for the purpose of sale or of preparation for sale and intended for the food of man." And that "the person to whom the meat, &c., belongs or did belong at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty." It was contended in a recent case, though without success, that as the words (Section 117, of the Public Health Act, 1875) only referred to exposure for sale, a person to whom meat belonged which was seized while "deposited in any place for the purpose of sale or of preparation for sale," could not be convicted. The case to which I refer was that of Mallinson *v.* Carr (1891) 1 Q. B. 48. There one Kettlewell sold a cow to the defendant Carr for thirty shillings, with a stipulation that it was not to be offered for human food. The beast was slaughtered and cut up into four quarters. Kettlewell heard that the carcase was going to be offered for human food and he gave notice to the inspector of nuisances, and by him the meat was seized. But in the subsequent proceedings the justices refused to convict, being of opinion that the decision in Vinter *v.* Hind applied, and that as inasmuch as the meat was not exposed for sale at the time of seizure no offence under Section 117 had been committed. Mallinson obtained a case for the opinion of the High Court, and on appeal the case was remitted with a decision that the magistrates were wrong in point of law. Justice Hawkins

says, "I can find nothing in section 117 which says that no man, even although he has unsound meat in his possession which is intended for the food of man, and although he is preparing it for sale with the intention of selling it can be convicted unless he actually exposes it for sale. I cannot think it could ever have been intended that, however great a quantity of diseased or unsound meat a man has in his possession for the purpose of selling it, he should be liable to no penalty under the Act. The Legislature cannot have intended that construction." Justice Stephen said "the justices have misapprehended the judgment in Vinter *v.* Hind. That case was entirely different from the present. It turned upon a different collection of words in the Statute, requiring a different coincidence of things in order to constitute an offence . . . The offence is having in a person's possession or on his premises, meat which is unsound or unfit for human food. There was unquestionable evidence in the present case that the respondent committed that offence. He was in possession of meat which was unsound and unfit for human food, and it is not an element of that offence that the meat should either have been exposed for sale or prepared for sale. . . . . I cannot agree with the argument that unless there is an exposure for sale, no offence is committed."

The statement that all diseases must affect the composition of the flesh and, that, though animal poisons may be neutralised or destroyed by the process of cooking and digestion, the composition of the muscles must exert an influence on the composition of human nitrogenous tissues, which no preparation or digestion can remove is no doubt right in *principle*, but if the officers responsible for the inspection of meat were to put this principle into practice, the meat supply would

become seriously reduced, and the high price consequent upon that would put the purchase of meat altogether beyond the reach of the poor.

It is therefore evident that upon the Inspector and Medical Officer of Health rests great responsibility in carrying out these duties, as these officers will frequently have to determine the fitness or otherwise of meat intended as human food.

The following diseases of animals are declared to render the meat unfit for the food of man:—

Cattle plague.
Epizootic pleuro-pneumonia.
Sheep-pox.
Cow-pox.
Influenza.
Rheumatism.
Black quarter or splenic fever.
Splenic apoplexy or braxy.
Pig typhoid.
Scarlatina.
Quinsy or strangles.
Anthrax or anthracoid erysipelas.
Tænia—producing Encysted Parasites.
Trichinæ.
Tuberculosis.

The post-mortem appearances of the meat of slaughtered animals which have suffered from the diseases mentioned, according to Dr. F. Vacher, are as follows:—

Cattle plague.—In the early stages there is a redness of the mucous membrane lining the respiratory passages, the alimentary canal, and the organs of generation—in the intestines there is a viscid, blood-coloured secretion.

In an advanced stage of the disease there will be a yellow, cheesy deposit in the nares and larynx, patches

of ecchymosis on the intestines, urinary and generative organs, and extravasations beneath the endocardium and pericardium, and swollen mesenteric glands. There is emphysema of the lungs and the blood is dark and thick.

According to Dr. Murchison, the lining "membrane of the fourth stomach is studded with numerous minute superficial ulcers. The urine is probably always albuminous.

Epizootic pleuro-pneumonia.—The pleura is thickened, the lungs show signs of adherence to the pericardium or diaphragm—if the disease is not extensive, the change in the colour of the lungs will be the best indication—the bright pink hue of health giving place to grey, mottled with spots blue, purple and red. The lungs will be much larger and heavier, when placed in water they will sink to the bottom, and there is loss of elasticity in them. The weight of the lungs, which are usually from 5 to 8 pounds, will be increased to 30 or 40 pounds. The meat is dark and ill-bled.

Sheep-pox.—This disease resembles human small-pox, though the pustules are larger than those of human small-pox, varying from $\frac{3}{8}$ to $\frac{1}{2}$ an inch in diameter. The mucous membrane is the seat of the eruption, the lungs contain spots in which the specific virus is deposited—in severe cases the joints and hoofs are inflamed and swollen, the eyes blood-shot and the nostrils packed with discharge. The lymphatic glands are enlarged and inflamed; the meat has a nauseous smell and the flesh is soft and pale and too moist.

Cow-pox.—The eruption of cow-pox is severe, the udder pustules assuming the appearance of running ulcers, while in a living beast the mouth is very sore; there is exhaustion from diarrhœa and fever.

Influenza.—Red patches denuded of epithelium are to be seen in the mouth—the conjunctiva and cornea are inflamed—there is pus in the nares and sinuses, the face is smeared with pus and blood, patches of ecchymosis are visible on the intestines and other abdominal viscera. The meat is dark, ill-bled, soft and watery.

Rheumatism.—Resembles influenza in beginning as a simple cold—joints stiff or thickened with deposit, fluid should be looked for in and around the affected joints; the animal has probably been slaughtered owing to obstruction in the bowels with hardened fæces, and the flesh is charged with watery fluid and is sour.

Black quarter or splenic fever.—A swelling of the forequarter or haunch, part affected, dark and unwholesome looking from erysipelas, spleen swollen and dark coloured, lungs generally congested, serous membranes stained more or less with ecchymosis.

Splenic fever, according to a report of the Veterinary Department of the Privy Council, has the following post-mortem appearances :—

1. The lungs sometimes partially congested, and commonly blown up with air between their lobules.

2. The first, second and third stomachs are usually healthy. The fourth stomach is intensely congested at its upper end.

3. The intestines are, with rare exceptions, congested and blood stained, more or less throughout their whole extent.

4. The liver often congested, is not materially implicated in the disease. The gall bladder has its coat sometimes thickened by a gelatinous-looking fluid, and its contents are dark and viscid.

5. The spleen is always enlarged, it should usually weigh one to one and a half pounds, but it is found in

the disease as high as five, six and even eight pounds in weight. It is dark coloured, and its structure broken up.

6. The kidneys are congested, and the mucous membrane within them often blood stained; in a small percentage of cases the bladder contains clear urine. In the great majority of cases this organ is greatly distended by bloody urine, and its internal lining is dotted with small bright pin-point-like extravasations.

7. The brain and spinal cord are congested more or less.

Splenic apoplexy or braxy.—When it affects sheep it resembles splenic fever with "head" symptoms; the spleen, which is rather over one pound in a beast, and rather over two ounces in weight in a sheep, will be quadrupled; subjects of this disease are not likely to be slaughtered before it proves fatal—the meat cannot be bled properly.

Pig typhoid.—Diffused and patchy redness of the skin, small ulcerations in the mouth and in the throat organs, stomach congested, ulcers on large and small intestines, the larger intestines most frequently affected, ulcers vary in form and size, they increase in size and run into one another, forming eight-shaped figures, large branching irregular sores, or ulcer chains or groups, the spleen usually darker, lungs often pneumonic and on dissection display tiny white specks due to cheesy deposit in small bronchial tubes. Generally there is some pleural exudation, the liver in severe cases is enlarged from congestion; if the eruption is abundant the carcase should not be passed.

Scarlatina in swine.—Acute inflammation of the skin and mucous membrane, the eruption specky at first, but soon spreads over whole surface of skin and is of a bright scarlet colour, the glands are inflamed and enlarged, a strong solution of salts is often used by the butcher to

bleach the outer skin, but the colour cannot be removed by this means from the subcutaneous fat.

Quinsy or strangles.—Glandular swellings in neck, organs of the throat inflamed, cheeks and underside of neck very red and swollen, there are raised red spots in the mouth.

Anthrax or anthracoid erysipelas.—The skin is frequently congested, livid rather than red, extravasations into the tissue and beneath serous and mucous membranes, lymph is exuded in greater or less quantity, rendering the carcase swollen and sodden.

Tænia—producing Encysted Parasites.—This disease is known as *cysticerci cellulosæ*, is very common in pigs, and produces tape worm in human subject if the parasites are taken into the stomach alive. The parasites are found in and between the muscles, fibres, on the surface of the muscles, and in the walls of the heart. The egg-shaped infest the bladder, they vary in size from $\frac{1}{8}$ to $\frac{1}{2}$ inch, and are easily seen and removed from the bladder upon gentle pressure. There is nothing remarkable in "measly pork," but the bladder worm, measles is the name given because of the appearance of the flesh on section. There is swelling round the shoulders. Young pigs are the most susceptible to the disease.

Trichinæ.—Trichinæ in pork may be seen without the aid of a magnifier, the flesh being distinctly speckled. A thin section of the muscle should be put into dilute liquor potassæ and water, in the proportion of 1 to 8, when the white specks will be clearly seen, to see the coiled up worm itself apply a pocket lens. The lungs are sometimes inflamed.

Tuberculosis or consumption.—Sometimes called "grapes" because of the resemblance of the tubercles to a bunch

of grapes. The tubercles or tumours vary in size from a pea to a walnut, they are found chiefly on the surface and in the lungs and on the walls of the chest, but in severe cases may be found in the liver, udder and glands of the neck. To remove traces of this disease, the butcher will carefully strip off portions of the lining membrane; the tubercles, if the disease is of long standing, will be large and "cheesy." It frequently happens that an animal having all the appearance of being healthy will be found seriously affected with the disease when slaughtered. But the affected beasts are as a rule very much emaciated and the meat will not "set."

Diseases of animals which in their later stages may render the meat unfit for the food of man, are:—

Foot and mouth disease.
Hoof-rot.
Jaundice.
Texas fever.
Inflammatory diseases of the lungs.
Cardiac dropsy.
Enthetic disease.

As regards the unwholesomeness of meat arising from decomposition, Dr. Christison in his work on "Poisons" says:—"The tendency of putrefaction to impart deleterious qualities to animal matters originally wholesome has long been known, and is quite unequivocal. To those who are not accustomed to the use of tainted meat, the mere commencement of decay is sufficient to render meat insupportable and noxious. Game, only decayed enough to please the palate of the epicure, has caused severe cholera in persons not accustomed to eat it in that state."

The practice of eating game which is "high" is common, not only to this, but to other countries, and we are also told that rotten fish is used by the Burmese, Siamese and Chinese, as a sort of condiment, without bad effect.

Dr. Pavy says :—"Cooking doubtless neutralises, to some extent, the effect of decomposition, and the secretion of the stomach (gastric juice), with the strongly antiseptic properties it possesses, will tend to prevent any further advance of ordinary decomposition as soon as the food reaches the stomach. Notwithstanding these salutary influences, however, experience shows that the resisting power enjoyed by those accustomed to our mode of life is not sufficient to allow meat tainted with decomposition to be consumed without incurring a risk of more or less severe gastro-intestinal derangement, if nothing more, being set up."

Though it is the custom in this, as well as other countries, to eat game in a "high" state, it is evident that meat of any kind in this condition cannot always be partaken of with impunity, and whenever the inspector finds beef, mutton, fish, rabbits, &c., intended for the food of man, which is putrid, he should adopt the measures provided by the Acts to prevent its being sold as human food.

Generally speaking good meat has the following characteristics :—

1. It is neither of a pale pink colour nor of a deep purple tint, for the former is a sign of disease, and the latter indicates that the animal has not been slaughtered, but has died with the blood in it or has suffered from acute fever.

2. It has a marbled appearance from the ramifications of little veins of fat among the muscles.

3. It should be firm and elastic to the touch, and should scarcely moisten the fingers, bad meat being wet, sodden and flabby, with the fat looking like jelly or wet parchment.

4. It should have little or no odour, and the odour should not be disagreeable, for diseased meat has a sickly cadaverous smell, and sometimes a smell of physic. This is very discoverable when the meat is chopped up and drenched with warm water.

5. It should not run to water or become very wet on standing, but should, on the contrary, dry upon the surface. (Dr. Letheby).

Specimens of diseased meat, for production in Court in any legal proceedings, may be preserved in methylated spirits, placed in a wide-necked stoppered bottle.

When animals are sick, the coat is rough or standing; the nostrils dry or covered with foam; the eyes heavy; the tongue protruded; the respiration difficult; movements slow and difficult; there may be diarrhœa, or scanty or bloody urine. (Parkes).

An ox should weigh not less than 600 lbs., and will range from this to 1200 lbs.

A cow may weigh a few pounds less; a good fat cow will weigh from 700 to 740 lbs.

A heifer should weigh 350 to 400 lbs.

A full grown sheep will weigh from 60 to 90 lbs., but the difference in different breeds is very great.

A full grown pig weighs from 100 to 180 lbs. or more.

The soundness of fish may be noticed by the smell, and if lifted, fresh fish would be "firm" and "stiff." Any drooping of the tail when the fish is held in an horizontal position may be taken to indicate that the fish is not fresh.

Dr. Vacher gives the following useful table to show when fish are in season :—

Fish.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Brill	—	—	in	in	in	in	in	in	in	in	in	—
Cod	in	in	in	—	—	—	—	—	—	in	in	in
Eels	in	in	in	—	—	in	in	in	in	in	in	in
Flounder	—	—	—	—	—	—	in	in	in	in	in	—
Hake	—	—	—	in	in	in	in	in	in	in	in	in
Haddock	in	in	—	—	—	—	—	in	in	in	in	in
Halibut	—	—	in	in	in	in	—	—	—	—	—	—
Herring	—	—	—	—	—	—	in	in	in	in	—	—
Mackerel	in	in	in	in	in	in	in	—	—	in	in	in
Plaice	—	—	—	—	in	in	in	in	in	in	in	in
Salmon	—	—	in	in	in	in	in	in	—	—	—	—
Skate	in	in	in	in	—	—	—	in	in	in	in	in
Smelt	in	in	in	in	in	—	—	—	in	in	in	in
Sprats	in	in	in	—	—	—	—	—	—	—	in	in
Sole	in	—	—	in	in	in	in	in	in	in	in	in
Turbot	in	in	—	—	in	in	in	in	in	in	in	in
Whitebait	—	—	—	in	in	in	in	in	—	—	—	—
Whiting	in	in	in	—	—	—	—	—	in	in	in	in

SLAUGHTER HOUSES.

The duties attending the inspection of slaughter houses are very onerous, especially if they are private slaughter houses, as owing to the distance of such premises one from the other, supervision in the matter

of meat inspection becomes next to impossible, even upon days set apart for slaughtering, but still more so at night, when it is possible, as I have reason to know, for suspicious animals to be run into such places under cover of darkness, slaughtered, dressed, and possibly cut up into joints, and removed to the butcher's shop, before the inspector hears of such acts, or has a personal opportunity of visiting the slaughter house, and thus the meat of animals which have suffered from an acute disease is often sold without the slightest protection to the public.

It is highly necessary that the local authorities should, as occasions present themselves, use the powers which they possess to refuse the granting of licenses to "private" slaughter houses, but rather, as these things must be, it would be to the interest of the public health that they should establish one or more public slaughter houses, giving every facility to butchers to slaughter cattle upon suitable premises, and in convenient situations.

These establishments would afford ample means for inspecting the animals brought to be slaughtered, and the meat before removal for sale, and it would put a stop to the vendors of "slink" meat, who depend chiefly upon butchers in possession of private slaughter houses for facilities to slaughter.

The following interpretation of terms, as to slaughter houses, cattle, &c., will be useful:—

The expression "slaughterer of cattle or horses" means a person whose business it is to kill any description of cattle, or horses, asses, or mules, for the purpose of the flesh being used as butcher's meat; and the expression "slaughter house" means any building or place used for the purpose of such business.

The expression "knacker" means a person whose business it is to

kill any horse, ass, mule, or cattle which is not killed for the purpose of the flesh being used as butcher's meat; and the expression "knacker's yard" means any building or place used for the purpose of such business.

The expression "cattle" includes sheep, goats, and swine. (54 & 55 Vic., C. 76).

"Slaughter house" includes the buildings and places commonly called slaughter houses and knacker's yards, and any building or place used for slaughtering cattle, horses, or animals of any description for sale. (38 & 39 Vic., C. 55).

It is enacted, by Section 169 of the Public Health Act, 1875, that to enable "urban" authorities to regulate slaughter houses within their district, the provisions of the Towns Improvement Clauses Act, 1847, in respect to slaughter houses, shall be incorporated with this Act.

The incorporated provisions are as follows :—

Section 128.—The Commissioners (Urban Sanitary Authority) shall, from time to time, by bye-laws . . . . . make regulations for licensing, registering and inspection of slaughter houses . . . . for preventing cruelty therein, and for keeping the same in cleanly and proper state, and for removing filth once in every twenty-four hours, and requiring them to be provided with a sufficient supply of water, and the imposition of penalties not exceeding £5 for breaking the bye-laws, and for a continuing offence the sum of ten shillings for every day the nuisance is continued after "conviction for the first offence."

Section 129.—Provides that the justices before whom any person is "convicted" of killing or dressing any cattle contrary to the provisions of this or the special Act (*i.e.*, 38 & 39 Vic., C. 55), or of non-observance of any bye-laws or regulations in this or the special Act, in addition to any penalty imposed, may suspend the

license for any period not exceeding two months, and may forbid for that period the slaughtering of cattle therein, and upon a second or subsequent like offence may revoke the license, and forbid absolutely the slaughtering of cattle upon these "premises."

SECTION 130.—"Every person who slaughters or allows the same to be used as a slaughter house during the suspension of the license, is liable to a penalty of £5 for every day during which the offence continues."

The Local Government Board has advised the Sanitary Authorities, before the license for a slaughter house is granted, that the following rules as to site and structure should influence their decision upon each application for a license:—

1. The premises to be erected or to be used and occupied as a slaughter house, should not be within 100 feet of any dwelling house, and the site should be such as to admit of free ventilation by direct communication with the external air on two sides at least of the slaughter house.

2. Lairs for cattle in connection with the slaughter houses, should not be within 100 feet of a dwelling house.

3. The slaughter house should not in any part be below the surface of the adjoining ground.

4. The approach to the slaughter house should not be on an incline of more than 1 in 4, and should not be through any dwelling house or shop.

5. No room or loft should be constructed over the slaughter house.

6. The slaughter house should be provided with an adequate tank or other proper receptacle for water, so placed that the bottom shall not be less than six feet above the level of the floor of the slaughter house.

7. The slaughter house should be provided with means of thorough ventilation.

8. The slaughter house should be well paved with asphalte or concrete, and laid with proper slope and channel towards a gully, which should be properly trapped and covered with a grating, the bars of which should not be more than three-eighths of an inch apart. Provision for the effectual drainage of the slaughter house should also be made.

9. The surface of the walls in the interior of the slaughter house should be covered with hard, smooth, impervious material to a sufficient height.

10. No water closet, privy, or cesspool, should be constructed within the slaughter house.

There should be no direct communication between the slaughter house and any stable, water closet, privy, or cesspool.

11. Every lair for cattle in connection with the slaughter house should be properly paved, drained and ventilated.

No habitable room should be constructed over any lair.

The undermentioned provisions apply to slaughter houses :—

"The owner or occupier of any slaughter house licensed or registered under this Act shall, within one month after the licensing or registration of the premises, affix, and shall keep undefaced and legible on some conspicuous place on the premises, a notice with the words "Licensed slaughter house," or "Registered slaughter house," as the case may be.

Any person who makes default in this respect, or who neglects or refuses to affix or renew such notice after requisition in writing from the urban authority, shall be liable to a penalty not exceeding five pounds for every such offence, and of ten shillings for every day during which such offence continues after conviction." (38 & 39 Vic., C. 55, S. 170).

Licenses granted after the adoption of this part of this Act for the use and occupation of places as slaughter houses shall be in force for such time or times only, not being less than twelve months, as the urban authority shall think fit to specify in such licenses. (53 & 54 Vic., C. 59, S. 29).

Upon any change of occupation of any building within an urban sanitary district registered or licensed for use and used as a slaughter house, the person thereupon becoming the occupier or joint occupier shall give notice in writing of the change of occupation to the Inspector of Nuisances.

A person who fails or neglects to give such notice within one month after the change of occupation occurs shall be liable to a penalty not exceeding five pounds.

Notice of this enactment shall be endorsed on all licences granted after the adoption of this part of this Act. (53 & 54 Vic. C. 59, S. 30).

If the occupier of any building, licensed as aforesaid to be used as a slaughter house for the killing of animals intended as human food, is convicted by a court of summary jurisdiction of selling, or exposing for sale, or for having in his possession, or on his premises, the carcase of any animal, or any piece of meat or flesh diseased or unsound, or unwholesome or unfit for the use of man as food, the court may revoke the license. (53 & 54 Vic., C. 55, S. 31).

In the metropolis application for the granting or renewing of licenses to slaughter cattle, must be made annually to the London County Council, but the applicant must give at least 14 days notice to the Sanitary Authority in whose district the premises are situated, and if they think fit the Sanitary Authority may show cause against the granting or renewing of the license, but should the Sanitary Authority intend to oppose the renewal or granting of a license to slaughter, notice of their intention must be given to the applicant.

COMMON LODGING HOUSES AND HOUSES LET IN LODGINGS.

The inspection of common lodging houses and houses let as lodgings forms a very disagreeable part of the Sanitary Inspector's duties, but in the Metropolis the

inspection of common lodging houses is delegated to the Metropolitan police. The supervision and inspection of houses let in lodgings is maintained under bye-laws, and these are practically the same in the Metropolis as in the provinces, except in the matter of air space of rooms so let off. The metropolitan regulations provide that the minimum space required for rooms used solely as sleeping apartments shall, in the case of houses let in lodgings, be 300 cubic feet, while for rooms used jointly for sleeping and living purposes shall be 350 cubic feet of air space per head for every adult. The air space required under provincial regulations is 400 to 450 cubic space under the same circumstances.

These houses both in the provinces and London are placed under the immediate care of the Sanitary Authorities.

It is absolutely necessary that the inspector should occasionally pay nocturnal visits to common lodging houses, in order to see to the due observance of the bye-laws as to the separation of sexes and to over-crowding.

Frequent visitations by day are required to enforce the provisions as to ventilation of rooms and airing of bedding, the cleaning and sweeping of rooms and staircases and the washing of bedding, &c.

The following is a summary of the sections of the Public Health Act, 1875, as to common lodging houses, with directions for the inspection of such houses before registration :—

Section 76 provides that the local authority are only to register those houses which have been "approved" of as common lodging houses, in pursuance of section 78 ; and only such "persons" can be registered as the keepers, who produce proper certificates of character.

Section 77 not only prohibits a person from keeping an "unregistered" house, but prohibits him from keeping a "registered" common lodging house, if he himself is not registered as the keeper of it. But while a penalty recoverable summarily is imposed by section 86 for receiving lodgers in an unregistered house, no such penalty is imposed for acting as the keeper of a common lodging house without being registered as such keeper.

Section 251 directs offences under the Act to be prosecuted in the manner directed by the Summary Jurisdiction Acts, but those Acts only relate to the prosecutions of offences for which some punishment or penalty is prescribed.

It seems, therefore, that the "unregistered" keeper of a "registered" common lodging house, though he may be liable to be "indicted," is not liable to be prosecuted summarily for keeping the house as a common lodging house.

Section 78 gives power to the local authority to "refuse to register" the house if their officer does not consider it to be a proper house to be used as a common lodging house, but they are not authorised to refuse to register the "keeper" of the house, because they do not approve of him, or are not satisfied as to his character—if he produces a certificate of character in due form and duly signed—unless the applicant has been three times convicted under the clauses relating to common lodging houses.

While considering the section which has reference to the inspection of such houses, it is essential that in all structural details the fitness of the premises should be carefully ascertained before the house is placed on the register. The rules which guide the inspecting officer

in his examination of the premises, may be thus briefly indicated :—

1. The house should possess the conditions of wholesomeness needed for dwelling houses in general.

2. It should have arrangements fitting it for its special purpose of receiving a given number of lodgers.

3. The house should be dry in its foundations and have proper drainage, guttering and spouting, with properly laid and substantial paving of any yard area abutting upon it. Its drains should have their connections properly made, and they should be trapped where necessary and adequately ventilated.

Except the soil pipe, from a properly trapped water-closet, there should be no direct communication of the drain with the interior of the house. All waste pipes from the sinks, baths, basins or cisterns, should be disconnected from the drain and made to empty in the open air over trapped gullies. The soil pipe should be efficiently ventilated. The closets or privies, and the receptacles of the house should be in a proper situation, of proper construction, and adapted to any scavenging arrangement which may be in force in the district. The house should have a water supply of good quality, and if the water be stored in cisterns they should be conveniently placed and of proper construction to prevent fouling of water. The walls, roof and floors of the house should be in good repair; inside walls should not be papered, the rooms and staircase should possess the means of complete light and ventilation; the windows should be of adequate size, able to open to the full extent, or if sash windows, to open both top and bottom. Any room proposed for registration that has not a chimney, should be furnished with a special ventilating shaft or opening, but a room not having a

window to the outer air, even if it has a special means of ventilation can seldom be proper for registration.

4. The number for which the house and each sleeping room may be registered, will depend greatly upon the dimensions of the rooms, and their facilities for ventilation, and partly upon the accommodation of other kinds. In a room of ordinary construction to be used for sleeping where there are the usual means of ventilation by window and chimney, about 300 cubic feet of air is recommended for each person, and many towns have bye-laws requiring 350 cubic feet per inmate, but in many rooms it will be right to appoint a larger space, and this can only be determined upon inspection of the particular room. Single iron bedsteads should be used (except in the case of married couples) in preference to double ones, or those of different material. The house should possess a kitchen and day-room accommodation apart from its bed-rooms, and a sufficiency of this will have to be attended to; rooms that are partly underground may not be improper for day-rooms. The amount of water supply, closet and privy accommodation and the provision of refuse receptacles should be proportionate to the number for which the house is to be registered. If the water supply is not supplied from works with constant service, a quantity should be secured for daily use on a scale, of not less than ten gallons a day per registered inmate where there are w.c's, or five gallons a day where there are dry closets. For every twenty lodgers a separate closet or privy should be required in the case of common lodging houses, but in houses let in lodgings there should be at least one closet for every twelve persons.

The washing accommodation should, wherever practicable, be in a special place, and not in bed-rooms or

living rooms, and the basins for personal washing, should be fixed and have water taps and discharge pipes connected with them.

Section 81.—It will be noticed that the Local Authority has power to require a supply of water to be obtained at a "reasonable" rate; they have, therefore, more discretion in the matter than is given them by section 62.

Section 82 requires the walls and ceilings to be limewashed at certain stated periods. Section 82 provides that a penalty may be imposed if the keeper of a common lodging house fails to report the number of lodgers received during the preceding day or night, if so required, upon schedules provided by the Local Authority; these reports are not very reliable, as in most cases the schedules have been filled up just prior to being brought to the Sanitary Office, instead of each morning. The number of lodgers, however, actually in the house will never be less than is stated on the schedule.

Section 84.—Under the Common Lodging House Act, 1851, the keeper is liable for not giving notice of the existence of fever within 48 hours, but by this section he must notify immediately the person is taken ill; this is also provided for under the provisions of the Public Health (Lond.) Act, 1891, and the Infectious Diseases (Notification) Act, 1889, where this Act has been adopted, and in many towns by local acts.

Section 85 gives power of entry at "all times," and it is needless to say how very important this provision is to inspectors, especially in the matter of overcrowding.

Section 86 enumerates the offences for which the keeper of a common lodging house is liable, and the penalty in each case.

Section 87.—To render a house a common lodging house, the inmates must be persons "promiscuously" brought together and not "members" of the same family, the allegations that the inmates are members of the same family, would, therefore, if proved, be a defence to any proceedings taken under the clause of this Act relating to common lodging houses.

Section 88.—If "two" convictions for overcrowding be obtained within three months, an order directing it to be "closed" for a specified time under section 109 may be made by the court, but if the keeper of a common lodging house be convicted "within three months" against any of the provisions of this Act relating to common lodging houses, the court may adjudge that he shall not keep a common lodging house for a period of five years after conviction, without the license "in writing" of the Local Authority.

With respect to the bye-laws relating to and regulating common lodging houses, it is not necessary to consider them as they differ in different towns.

What is a "common lodging house?" So far we have no legal definition given to us. The Act does not give us any definition of the class of house referred to by the somewhat vague term "common lodging house," and there cannot well be any conclusive decision of the point as the question must always be more or less one of fact.

The General Board of Health, in a circular dated 17th October, 1853, stated that they deemed it expedient that the following opinions of the then Law Officers of the Crown, Sir A. E. Cockburn (late Chief Justice), and Sir W. P. Wood (late Lord Chancellor), should be brought under the notice of the Local Boards of Health throughout the country.

First Opinion.

"It may be difficult to give a precise definition of the term "common lodging house," but looking at the preamble and general provisions, it appears to us to have reference to that class of lodging houses in which persons of the poorer class are received for short periods, and though strangers to one another, are allowed to inhabit one common room. We are of opinion that it does not include hotels, inns, public-houses, or lodgings let to the upper and middle class."

Second Opinion.

The points upon which our opinion is desired, appear to us to be the following :—

"1. What is the meaning of that part of the definition of a common lodging house in our former opinion, which refer to parties inhabiting a common room being 'strangers to one another'? The observation would imply that we meant that the parties must be persons previously unacquainted with one another. Our obvious intention was to distinguish lodgers promiscuously brought together from members of one family or household.

"2. Whether lodging houses, otherwise coming within the definition, but let for a week or longer period, would, from the latter circumstance be excluded from the operation of the Act? We are of opinion that the period of letting is unimportant in determining whether a lodging-house comes under the Act now in question.

"3. Who is to be considered the keeper of a common lodging house where the owner, letting the lodgings, does not himself reside in the house? We are of opinion

that where he neither resides in the house, nor exercises any control over its management, but simply receives the rent, he cannot be considered the keeper. It is clear, that in such a case, he would not comply with the Act. But where the owner, though not resident in the house, either in person or through an agent, colourably or otherwise exercises control over its management, we have no doubt that he should be considered the keeper.

"A serious difficulty arises where the owner *bona fide* lets different parts of the house to different individuals, and these lessees take in lodgers of such a description as would in the ordinary case constitute the house a common lodging house. The question which here arises is, whether each apartment so used is to be considered a common lodging house, of which the lessee is the keeper. It seems to us difficult to suppose that the Act that refers to common lodging houses was intended to apply to single apartments, so that every room in the house might become a separate common lodging house. On the other hand it is to be observed, that part of a house, "if used as a common lodging house," shall be included in the Act.

"Considering, therefore, that apartments thus let and occupied are especially within the mischief intended to be remedied by the Act, we think an attempt should be made to treat them as common lodging houses, and to enforce the provisions of the Act against the tenants who thus admit lodgers. At the same time we feel bound to say, we entertain considerable doubts as to the results."

The question as to what is a common lodging house came before the Common Pleas Division. A house was held to be a common lodging house which received

all comers; the itinerant character of the greater number of the lodgers, making it possible as a rule that they did not make any long stay at the house. Justice Grove said, "the object of this provision in the Act being to promote health by preventing dirt and over-crowding, the evidence seems to me clearly to show that this is a house to which such a provision is applicable."

The definition of a common lodging house as defined by the Public Health (Scotland) Act, 1867, is:—A house, or part thereof, where lodgers are housed at an amount not exceeding 4d. per night for each person, whether the same is paid nightly, weekly, or at any period not longer than a fortnight, or where the house is licensed to lodge more than 12 persons.

Common lodging houses in the Metropolis are still governed by 14 & 15 Vic., C. 28 and 16 & 17 Vic., C. 41.

In 1891 the writer obtained the information on page 199 respecting common lodging houses, from inspectors in different parts of the country, and though the matter has before been made public, the statistics thus collected, will be interesting to those readers who now peruse them for the first time.

It will be gathered from the statistics referred to, that common lodging houses are sometimes inspected by the police, even in the provinces, this to many persons would appear proper, but without disparaging the abilities of the police force to deal with such houses, I would say, that on matters of public health, the police of all men are least competent to exercise supervision over them, having as a rule no special training in this direction, and where officers have the necessary abilities, such duties are neglected for other police duties in which they are more particularly interested; hence it is not surprising to find The London County Council making overtures

STATISTICS RECEIVED FROM TWENTY-TWO LARGE TOWNS AS TO COMMON LODGING HOUSES.

Local Authority	Estimated Population Middle of 1890	By whom Inspected	Number of Houses Registered	Total Lodging Accomodation	Number of Lodgers reported as being received during 1890	Total Number of Beds.	Bed Accommodation.			Number of Model Lodging Houses.	Model Lodging Houses Erected by Local Authority or Private Enterprise	Model Lodging Houses specially built or adapted from existing building
							Married Couples	Females	Males			
Ashton-under-Lyne	40,448	Police	17	683	—	445	141	42	262	1	Private enterprise	Specially built
Blackburn	125,081	Local authority	61	1156	—	—	—	—	—	—	—	—
Birmingham	461,865	do.	87	1959	436,709	1921	79	135	1707	2	Private enterprise	1 Specially built 1 Adapted building
Bury	61,000	do.	18	615	—	540	75	465	male & female	—	—	—
Bradford	240,515	do.	52	1836	409,693	—	—	—	—	2	Private enterprise	Specially built
Chester	39,000	do.	15	161	—	—	—	—	—	—	—	—
Crewe	42,000	do.	6	113	—	—	—	—	—	—	—	—
Glasgow	—	do.	86	7192	—	7192	—	432	6760	13	7 Local authority 6 Prvt. enterprise	9 Specially built 4 Adapted buildings
Hanley	56,587	do.	10	380	—	305	46	8	251	1	do.	Specially built
Huddersfield	94,253	Police	16	388	79,581	234	64	35	135	1	Local authority	Adapted building
Leeds	363,799	do.	88	2714	530,345	1800	400	300	1100	6	Private enterprise	do.
Leicester	154,344	Local authority	27	593	—	—	—	—	—	4	do.	2 Specially built 2 Adapted buildings
Liverpool	613,463	do.	830	15587	—	5206	—	103	5103	90	do.	4 Specially built 86 Adapted buildings
Manchester	379,437	Police	233	6392	—	—	—	—	—	24	do.	do.
Newcastle-on-Tyne	162,984	do.	93	1934	401,596	1039	140	899	male & female	—	—	—
Nottingham	244,909	Local authority	60	993	—	693	300	20	373	3	Local authority	Adapted buildings
Oldham	146,716	Police	10	841	230,930	754	67	20	667	2	Private enterprise	Specially built
Preston	105,163	Local authority	23	736	—	—	—	—	—	—	—	—
St. Helens	68,000	Police	22	307	—	174	—	—	—	—	—	—
Warrington	50,000	do.	27	751	102,000	—	—	—	—	2	Private enterprise	Adapted buildings
Wigan	54,509	Local authority	27	478	125,939	399	31	5	363	—	—	—
Wolverhampton	83,407	Police	23	378	—	—	—	—	—	—	—	—

to the Local Government Board, asking that common lodging houses might be placed under their supervision, or that of the vestries and district boards.

BAKEHOUSES.

The Factory and Workshop's Act Amendment Act, 1883, delegated the duty of inspecting bakehouses to the Medical Officer of Health, but such duties are usually performed by the inspector, though legal proceedings must be instituted by the former officer. Under the Public Health (London) Act, 1891, the Sanitary Inspector has the same powers as the medical officer of health with regard to bakehouses.

The following suggestions and regulations will prove useful to those inspectors whose duties include the inspection of bakehouses:—

By section 17 of the Factory and Workshop Act, 1883, it is directed that the provisions of sections 3, 33, 34 and 35 of the Factory and Workshop Act, 1878, shall, as regards retail bakehouses, be enforced by the local authority of the district in which the retail bakehouse is situated, and not by an inspector under the Factory and Workshop Act, 1878; and for this purpose the Medical Officer of Health of the Local Authority is to have and exercise all such powers of entry, inspection, taking legal proceedings, and otherwise, as an inspector under the Factory and Workshop Act, 1878.

Section 3 of the Act of 1878 directs that the bakehouse "shall be kept in a cleanly state, and free from effluvia arising from any drain, privy, or other nuisance;" tha it "shall not be overcrowded while work is carried on

therein;" and that "it shall be ventilated so as to render harmless all gases and dust" generated in the course of the manufacturing process. Sections 33 and 34 require the periodical cleansing of the bakehouse, Section 35 requires the proper separation from the bakehouse of any room on the same level used as a sleeping place.

By section 15 of the Act of 1883, it is provided, with regard to bakehouses occupied for the first time after June 1st, 1883, that "no water-closet, earth-closet, privy or ashpit, shall be within or communicate directly with the bakehouse;" that "any cistern for supplying water to the bakehouse shall be separate and distinct from any cistern for supplying water to a water-closet;" and that "no drain or pipe for carrying off fæcal or sewage matter shall have an opening within the bakehouse."

By section 16 of the same Act it is provided that if any room or place used as a bakehouse is in such a state as to be on sanitary grounds unfit for use or occupation as a bakehouse, the occupier shall be liable on summary conviction to a penalty.

The following may serve as model regulations for bakehouses:—

1. Every bakehouse shall be kept in a cleanly state, and free from effluvia arising from any drain, privy, water-closet, or other nuisance. The floors shall be carefully swept at least once every twenty-four hours, and the sweepings shall be immediately placed in an impermeable covered receptacle, and removed from the bakehouse at not longer intervals than every seven days.

2. All the inside walls of the rooms of the bakehouse, and all the ceilings or tops of such rooms, and all the passages and staircases of the bakehouse, shall either be painted with oil, or varnished, or limewashed.

Where painted with oil or varnished, there shall be three coats of paint or varnish; and the paint or varnish shall be renewed once at least in every seven years, and shall be washed with hot water and soap once at least in every six months. Where limewashed, the limewashing shall be renewed once at least in every six months. The cleansing should be done in the months of April and October.

3. The troughs and all the utensils used in the making of bread and pastry shall be kept scrupulously clean.

4. A place on the same level with the bakehouse, and forming part of the same building, shall not be used as a sleeping place:—(*a*) Unless it is effectually separated from the bakehouse by a partition extending from the floor to the ceiling. (*b*) Unless there be an external glazed window of at least nine superficial feet of area, of which at the least $4\frac{1}{2}$ superficial feet are made to open for ventilation.

5. No water-closet, earth-closet, privy, or ashpit shall be within or communicate directly with the bakehouse.

6. Any cistern for supplying water to the bakehouse shall be separate and distinct from any cistern for supplying water to a water-closet.

7. No drain or pipe for carrying off fæcal or sewage matter shall have an opening within the bakehouse, and every sink-waste, or other pipe used for carrying off surface water within the bakehouse, shall be efficiently trapped and disconnected from any drain.

8. Every bakehouse shall be efficiently lighted, shall be ventilated so as to render harmless all gases and dust, and shall not be overcrowded while work is carried on therein.

9. Every bakehouse shall be used for the purposes of the trade only.

10. No animal shall be kept in the bakehouse on any pretence whatever.

11. No person suffering, or who has recently suffered, from any infectious disease shall be permitted to enter the bakehouse, or take part in the manufacture or sale on the premises, of bread, biscuits, or confectionary.

12. The owner or occupier of a bakehouse shall give immediate notice to the Medical Officer of Health of any case of infectious disease occurring on the same premises as the bakehouse.

Every bakehouse in which there is a contravention of sections 3, 33 and 34 of the Factory and Workshop Act, 1878, which provide for the sanitary condition and cleansing of the bakehouse, shall be deemed not to be kept in conformity with the Act, and the occupier thereof is liable for default to a fine not exceeding ten pounds.

The use of a bakehouse for sleeping purposes, or of a room on the same level as the bakehouse, insufficiently separated from it and insufficiently ventilated and lighted, is punishable under section 35 of the same Act by a fine not exceeding twenty shillings for the first offence, and of a sum not exceeding five pounds for every subsequent offence.

An infringement of section 15 of the Factory and Workshop Act, 1883, which prohibits—A direct communication between a water-closet, earth-closet, privy, or ashpit, with the bakehouse; the supply of water to a bakehouse from a cistern also supplying a water-closet; the opening into a bakehouse of a drain carrying off fæcal or sewage matter, is punishable by a fine not exceeding forty shillings, and a further fine not exceeding five shillings for every day during which the infringement is continued after a conviction.

COWSHEDS, DAIRIES AND MILKSHOPS.

The inspection of cowsheds, &c., is a matter of great importance, and the principal points requiring the attention of the inspector having supervision of such places, are, the drainage, water supply, ventilation, overcrowding, cleanliness and the frequent removal of refuse.

The powers of the Privy Council were transferred to the Local Government Board by 49 and 50 Vic., C. 32, S. 9, which also transferred to local authorities the powers formerly exercised by quarter sessions.

The registration of these businesses cannot lawfully be withheld by the local authority, but if the conditions of the regulations as to cowsheds, &c., adopted by the local authority are not complied with, proceedings may be instituted against the offender.

In the Metropolis the County Council has the power to refuse or grant authority for carrying on the trade of a cowkeeper, purveyor of milk and dairyman, and the Sanitary Authorities in whose district the business is carried on may object to the granting of licenses to any place or a renewal of such license.

All the licenses in the metropolis are for one year only, and before any license is granted or renewed by the County Council, the persons requiring such license must apply first to the Sanitary Authority of the district in which his business is situated, when the officers of the Sanitary Authority may raise an objection on the day appointed for granting the licenses, to any place which in their opinion is unsuited for carrying on the trade. Notice of any such objection must be given by the Sanitary Authority to all parties concerned.

CANAL BOATS.

The Sanitary Inspector is deputed to inspect canal boats plying within his district, but the registration of canal boats can only be effected in those districts prescribed by the Local Government Board as registration authorities.

There are two canal boat acts, viz., the Canal Boats Act, 1877 and 1884, and powers are given to the Local Government Board to make regulations for :—

1. The registration of canal boats, including certificates of registration, fees in connection with such registration, and

2. For the lettering marking and numbering of such boats, and

3. For fixing the number, age and sex of the persons who may be allowed to dwell in a canal boat having regard to the cubic space, ventilation, provision for the separation of the sexes, general healthiness, and convenience of accommodation of the boat, and

4. For promoting cleanliness in and providing for the habitable condition of canal boats, and

5. For preventing the spread of infectious disease by canal boats.

The registration authority are compelled to register all boats which conform to the following regulations:—

The following conditions shall be complied with before a canal boat is registered ; that is to say :—

The boat shall contain a cabin or cabins, clean, in good repair, and so constructed as to be capable of being maintained at all times weather-proof, dry, and clean.

The interior of any after cabin intended to be used as a dwelling shall contain not less than 180 cubic feet of free air space, and the

interior of any fore cabin, if intended to be so used, shall contain not less than 80 cubic feet of free air space.

Every cabin, if intended to be used as a dwelling, shall be provided with sufficient means for the removal of foul and the admission of fresh air, exclusive of the door or doors and of any opening therein.

Every cabin, if intended to be used as a dwelling, shall be so constructed or fitted as to provide adequate and convenient sleeping accommodation for the persons allowed by these regulations to dwell in the boat.

If the boat be a "narrow" boat, every cabin intended to be used as a dwelling shall be so constructed or fitted that there shall be no locker or cupboard obstructing the free passage from the door to the bulkhead, and no shut-up cupboard above the cross-bed on more than one side of the cabin.

One cabin at the least in the boat shall be furnished with a suitable stove and chimney in a safe and convenient situation, and in all other respects sufficient for the reasonable requirements of the persons allowed by these regulations to dwell in the boat.

The boat shall be properly furnished or fitted with lockers, cupboards, and shelves of suitable construction and adequate capacity, and in all other respects sufficient for the reasonable requirements of the persons allowed by these regulations to dwell in the boat.

The boat, if intended to be ordinarily used for the conveyance of any foul or offensive cargo, shall contain, between the space to be occupied by such cargo and the interior of any cabin intended to be used as a dwelling, two bulkheads of substantial construction, which shall be separated by a space not less in any part than four inches, and open throughout to the external air, and furnished with a pump for the removal of any liquid from such space, and the one next adjoining the space to be occupied by the cargo shall be watertight.

The boat shall be furnished with a suitable cask or other appropriate vessel or receptacle of sufficient capacity for the storage of not less than three gallons of water for drinking.

For the purpose of fixing the number, age, and sex of the persons who may be allowed to dwell in a canal boat, which conforms to the conditions of registration provided by these regulations, and which shall, in pursuance of the statutory provisions in that behalf,

have been registered as a dwelling, the following rules shall apply :—

Subject to the conditions prescribed with respect to the separation of the sexes, the number of persons who may be allowed to dwell in the boat shall be such that in the cabin or cabins of the boat there shall not be less than 60 cubic feet of free air space for each person above the age of 12 years, and not less than 40 cubic feet of free air space for each child under the age of 12 years.

Provided that in the case of a boat built prior to the thirtieth day June, one thousand eight hundred and seventy-eight, the free air space for each child under the age of 12 years shall be deemed sufficient if it is not less than 30 cubic feet.

Provided also, that in the case of a boat registered as a "fly" boat, and worked, by shifts, by four persons above the age of 12 years, there shall be not less than 180 cubic feet of free air space in any cabin occupied as a sleeping place by any two of such persons at one and the same time.

A cabin occupied as a sleeping place by a husband and wife shall not at any time while in such occupation be occupied as a sleeping place by any other person of the female sex above the age of 12 years, or by any other persons of the male sex above the age of 14 years.

In the case of a boat built prior to the thirtieth day of June, one thousand eight hundred and seventy-eight, a cabin occupied as a sleeping place by a husband and wife may be occupied by one other person of the male sex above the age of 14 years, subject to the following conditions :—

That the cabin be not occupied as a sleeping place by any other person than those above mentioned.

That the part of the cabin which may be used as a sleeping place by the husband and wife shall, at all times while in actual use, be effectually separated from the part used as a sleeping place by the other occupant of the cabin by means of a sliding or otherwise movable screen or partition of wood or other solid material so constructed or placed as to provide for efficient ventilation.

A cabin occupied as a sleeping place by a person of the male sex above the age of 14 years shall not, at any time, be occupied as a sleeping place by a person of the female sex above the age of 12 years, unless she be the wife of the male occupant, or of one of the male occupants.

The following are the interpretations as to canal and canal boats :—

"Wide boat" means a boat not less than seven feet six inches beam.

"Narrow boat" means a boat of less than seven feet six inches beam.

"Canal" includes any river, inland navigation, lake, or water being within the body of a county, whether it is or not within the ebb and flow of the tide.

"Canal boat" means any vessel, however propelled, used for the conveyance of goods along a canal, and not a ship registered under the Merchant Shipping Act, 1854, and the Act amending the same.

The following rules have been adopted for determining the internal dimensions and cubical capacity of the cabin or cabins ;—distinguishing, in each case, where necessary, the rate of deduction :—

RULE A (for "wide" boats).

Measure :—

The height from the floor to the roof in the middle of the cabin.

The length from the bulkhead to the door of the opposite cupboard.

The width across the cabin at the bulkhead.

The product of the height, length, and width thus measured will represent, for the purpose of this rule, both the gross and the net cubical capacity or free air space.

RULE B (for "narrow" boats).

Measure:—

The height from the floor to the roof in the middle of the cabin.

The length from the bulkhead to the end of the cabin at the side of the doorway.

The greatest width from side to side of the boat at the bulkhead.

The product of the height, length, and greatest width thus measured will represent the gross cubical capacity of the cabin.

To obtain the net cubical capacity or free air space of the cabin, deduction from the gross cubical capacity should be made in accordance with the following directions:—

If the cabin have only the following shut-up cupboards or lockers, viz., a table cupboard, a side bed-locker or cupboard, a cross bed-locker or lockers, and a cupboard above the cross bed—

(*a*) If the height of the cabin be not less than five feet, deduct one-fifth.

(*b*) If the height of the cabin be less than five feet, deduct one-fourth.

If the cabin have only the following shut-up cupboards or lockers, viz., a table cupboard, a cross bed-locker or lockers and a cupboard above the cross-bed—

(*a*) If the height of the cabin be not less than five feet, deduct one-sixth.

(*b*) If the height of the cabin be less than five feet, deduct one-eight.

If the cabin have only the following shut-up cupboards or lockers, viz., a table cupboard and a cupboard above the cross-bed—

(*a*) If the height of the cabin be not less than five feet, deduct one-tenth.

(*b*) If the height of the cabin be less than five feet, deduct one-twelfth.

As the Canal Boats Inspector is not afforded very much time in which to complete his enquiries when making the casual inspections, he would effect a considerable saving of time by having a pocket-book with the following printed headings:—

Canal Boat Inspector's Pocket Book.

Date Boat's name

No. Registered at

Owner's Name and Address

Captain's ditto

Is it a *Wide*, *Narrow*, or *Fly* Boat?

Is Registration marked *on Stern*, or *on both sides?*

Was Certificate produced?

Did it identify Owner with Boat?

No. of Adults registered for Aft Fore

Ditto Occupying Aft Fore

Did any Female over 12 years occupy?

Was partition separating sexes, of wood?

When was Cabin last painted?

State general condition of Cabin.

Was Ventilation efficient?

Was Water Vessel, *Cask*, *Jug*, or *Tin Can* on board?

Was Pump used every 24 hours?

If offensive Cargo, were there Double Bulkheads?

Was any Occupant ill?

Remarks and *Contraventions* (if any) of the Acts or Regulations.

CANAL BOAT FORM OF NOTICE.

CONTRAVENTION OF CANAL BOATS ACTS, ETC.

Boat No. Registered at
Owner's Name
Address
Master's Name
Contravention

State Sec. of Act or Regulations and particulars.

189
— — Date Boat inspected.
— — Date Complaint note sent Owner.
— — Latest date stipulated for return of Certificate.
— — Date reply (if any) and substance thereof.
— — Date Certificate received.
— — Date of Certificate signed by
Canal Boat Inspector for the
Port, Urban or Rural
S. A. of

REMARKS.

Initials of H. M. Chief Inspector under Canal Boats Acts on visit of Enquiry and Date.

189

CANAL BOATS ACTS, ETC.

SIR,

I have to request that you will have the complaint named on the annexed form—having reference to a boat of which you are the Registered Owner—remedied forthwith, and thereafter obtain the Certificate that such has been done (also on the form annexed), signed by some duly appointed Inspector of Canal Boats, and return the same here, as addressed, within days from this date, *otherwise proceedings will be taken.*

This Notice is not required by the Acts, and does not prevent proceedings being commenced against you in the meantime by any other Sanitary Authority.

Your obedient Servant,

M .....

189

CANAL BOATS ACTS, ETC.

Re Canal Boat No. Registered at

COMPLAINT.

The above-named boat was met with on the day of 189 contravening the in so far that

State Sec. of Act or Regulation.

189

CERTIFICATE.

I hereby certify *that I inspected the above-named Boat this date and found that the cause of complaint had now been remedied.*

Signature
Canal Boat Inspector for the
Port, Urban or Rural
Sanitary Authority of

REMARKS (if any).

N.B.—If this form is not *duly returned by the Owner within the specified time* legal proceedings will be taken.

The pocket-book and the form of notice referred to, are printed and supplied by Messrs. Geo. Jones and Son, 87 and 89 Edmund St., Birmingham, and are their registered property.

THE SALE OF FOOD AND DRUGS ACT.

The inspector employed to carry out the Sale of Food and Drugs Act of 1875, and the Amendment Act 1879, will find the duties exceedingly unpleasant, and surrounded by many difficulties. He will be required to act very cautiously in the matter of procedure, otherwise it will be useless to institute legal proceedings for offences under this Act.

The expression "food" includes every Article used for the food or drink by man, other than drugs or water. The term "drug" includes medicines for internal or external use. Obviously, the term food under this Act includes, besides commercial articles of food, condiments, and flavouring substances used for the purpose of rendering food more palatable or digestible.

In the case of Warren v. Phillips 44 J. P. 61; 68 L. T. 133, which was an appeal made before the Recorder of Cambridge against the decision of the magistrates for that Borough who had convicted the appellant of selling an article of food, to wit, baking powder mixed with alum, so as to be injurious to health—it was held that baking powder in this case was not an article of food, or that bread made with it becomes an article of food injurious to health.

Baking powder is evidently looked upon as a "compound article" and when any of the constituents which go to form such compound is taken away, the article is

not complete, nor is it in a fit state to be used for food. The Recorder considered that the baking powder was not complete without the alum, unless the ingredients which remained constituted an article of food.

"No person shall mix, colour, stain, or powder, or order or permit any other person to mix, colour, stain, or powder, any article of food with any ingredient or material so as to render the article 'injurious to health' with intent that the same may be sold in that state, and no person shall sell any such article so mixed, coloured, stained or powdered under a penalty in each case not exceeding £50 for the first offence; every offence after a conviction for a first offence shall be a misdemeanour, for which the person on conviction shall be imprisoned for a period not exceeding six months with hard labour." (38 and 39 Vic., C. 63, Section 3).

The severity of the penalties under the section just referred to is due no doubt to the fact, that it relates to the adulteration of articles of food with substances injurious to health. Prosecutions under this section are rare, first, because articles of food are seldom found to be so adulterated, and secondly, any legal proceedings in such cases would necessarily require the services of scientific and professional witnesses to prove that the article was injurious to health.

In any prosecution of this kind it would be no defence to say, that the article so mixed, &c., was accompanied with a descriptive label referred to in section 8 of the Act.

There is a very important difference between sections 3 and 4, as in the latter, it is not necessary to prove that the "drug" is mixed with any ingredient or material injurious to health, it being sufficient to prove that the quality or potency of the drug is "deficient."

A person is not liable to be convicted under sections 3 and 4 of this Act if he is able to prove "absence of knowledge" as provided by section 5.

It is provided by section 6 of the Food and Drugs Act that "no person shall sell to the *prejudice of the purchaser* any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser."

A considerable conflict of opinion has arisen as to what the words "to the prejudice of the purchaser" really mean. Section 8 of the Act provides that "a sale shall not be deemed to be to the prejudice of the purchaser which is a sale of an article of food or a drug mixed with any matter or ingredient not injurious to health, and not intended fraudulently to increase its weight, bulk, or measure, or conceal its inferior quality, if at the time of delivering such article or drug he shall supply to the person receiving the same a notice by label distinctly and legibly written or printed on or with the article or drug, to the effect that the same is mixed."

But is it a sale to "the prejudice of the purchaser" if the purchaser knows that the article which he buys is not of the nature, substance and quality demanded by him, even though no label is delivered to him by the vendor pursuant to the provisions of the 8th section? This was the point raised in Sandys *v.* Small, 3 Q. B. D. 449. There an information was preferred by Sandys, the inspector under the Sale of Food and Drugs Act, against Small, charging that Small did unlawfully sell to him half a pint of an article purporting to be whiskey, which article was not of the nature, substance and quality of whiskey. It appeared that Sandys employed one Samuel Slack to go into Small's public house and ask for half a pint of whiskey; the whiskey was poured into a bottle without observation as to its quality, or any label being put on the bottle. Slack paid

for the whiskey and went out and handed it to Sandys, who thereupon went into the house and went through the usual formula prior to having the article analysed. A notice was posted in the bar (which notice Sandys had seen) stating that "all spirits sold here are mixed." It was held that under the circumstances the purchaser was not prejudiced. Lord Chief Justice Cockburn said, "This appeal must be dismissed. I should be very sorry to diminish by any decision of this Court the effect of so useful an Act of Parliament as that which we are now considering. It is an Act which is of the greatest advantage and assistance to small consumers in humble station, who may be subject to imposition and who may be defrauded. We must, however, be careful not to interfere with the relation of vendor and purchaser, and must not limit the freedom of contract and dealing which mutually exists between parties to a bargain. Section 6 of the Sale of Food and Drugs Act provides in effect that, when a vendor who proposes to sell a particular article, sells it in a state altered in some way or other from that in which it originally existed, and from the quality of the article demanded by the purchaser, it is to be assumed he has done this to the prejudice of the purchaser unless he duly and sufficiently makes known the fact of such alteration to the purchaser; but if the alteration of substance demanded is known to the purchaser, and if the customer purchases the article on that footing, then it cannot be intended that such a dealing should be interfered with. If a vendor sells a mixed article of food he must prove that the purchaser was aware that the article was mixed. The statute shows clearly how the vendor can secure himself against the presumption of his having acted fraudulently, and if he gives the notices required

by the Act he thus gets rid of all chance of having any information prepared against him. If, however, he does not follow the provisions of section 8, with regard to the giving of notices, he must then prove in some other and satisfactory way, that the transaction was good and free from fraud, and if he can show that he told the purchaser, or brought in any way to the knowledge of the purchaser that the article sold had mixed with it some matter which is not injurious to health, and which is not intended fraudulently to increase its bulk, weight or measure, then I am of opinion that no offence has been committed within the provisions of the statute, inasmuch as there has been no such sale to the prejudice of the purchaser. There may be cases therefore in which it is sufficient for the vendor to rely upon a notice hung up in the bar as was done here, even though, as in this case, a notice was not actually delivered to the purchaser nor was there any label on the bottle. We have nothing before us to show that the purchaser was in any way deceived; only we do not think it necessary to send the case back on this ground, because both from the statements in the case, and from the fact that the publican had affixed notices in conspicuous places, I think it is clear that the purchaser was well aware of what he was buying."

Morris *v.* Johnson, 54 J. P., is a case on the same point. There Morris, the inspector under the Sale of Food and Drugs Acts, sent his assistant into Johnson's public-house, and without going into the bar or kitchen he went into a club-room and asked for whiskey, and that supplied was 37 degrees under proof. A notice that "all spirits are diluted," was stuck up in the bar and kitchen, but not in the club-room, and nothing was said to the assistant on delivery. The case was

remitted to the justices to enquire whether the assistant knew that the practice was at Johnson's house to sell only diluted spirits. Justice Mathew said: "In this case it appears that this publican was carrying on his ordinary business in his own way, and that there was no intention whatever to defraud anybody. It was at least odd that these customers on this occasion did not go into the ordinary rooms where the notice was put up, and which might have informed them if they were in doubt, but found their way at once into the club-room where they sat down and called for some whiskey. Under these circumstances I think we must be critical in looking at the evidence, as it was incumbent on the respondent to satisfy the justices that the appellant did know that the spirits sold in the house were sold in a diluted state. The purchaser's complaint is that they did not see the notice, but then there was no finding in the case whether they did not know well enough of the diluting of all spirits before sold at the respondent's house. That point is not at all made clear, and therefore I think we must remit the case to the justices to have this point found. If the justices find that the men did not know that the spirits were sold diluted, then there should have been a conviction; but if they did know then there should be no conviction."

Gage *v.* Elsey, 48 L. T. N. S. 226, was a similar case, in which the publican on handing the spirits to the inspector said, "That is what we sell to the public, and there is our notice," pointing to a notice to the usual effect; it was held that the purchaser was not prejudiced.

In deciding therefore whether a purchaser is prejudiced, the question is:—Was the purchaser actually deceived? Did he know that the article sold to him was diluted or mixed, as the case may be? If he did

know, then there can be no conviction under the 6th section.

We see then that absence of knowledge of adulteration on the part of the purchaser is a necessary condition precedent to a conviction. What about absence of knowledge of the adulteration on the part of the vendor? Is it a good defence to prove that the vendor had no knowledge that the article which he sold was adulterated? This point was discussed in the recent case of Betts *v.* Armstead, 58 L. T. N. S. 811. There the inspector of nuisances at Nottingham, bought at Armstead's shop a loaf of bread, which on analysis, was found to contain alum in the proportion of 48 grains to the four-pound loaf. Armstead and two of his men gave evidence that there was not, and had never been any alum on the respondent's premises; that no alum had been used in the manufacture of the bread; that they were not aware that there was any alum in the flour from which the bread had been made; and that if any alum was in the bread, it must have been in the flour when purchased by the respondent. He could not take advantage of section 25 of the Act, as apparently he had no express written warranty. Still the justices considered that he was innocent, and dismissed the case. On appeal it was held that the absence of knowledge was no defence, because, to decide otherwise, would be to decide that section 6 must be construed as if it read, "no one shall *knowingly* sell to the prejudice of a purchaser." That was not the intention of the Legislature, as section 5 provides that no one shall be liable to be convicted under the 3rd and 4th sections if he can prove absence of knowledge, so that section 6 was purposely omitted.

The case of Lane *v.* Collins, 14 Q. B. D. 193, is in-

teresting, as showing the great care which must be taken to ensure that the proceedings are commenced under the proper section. In that case Collins, in answer to a request of Lane, who was the inspector under the Food and Drugs Act for the County of Surrey, gave him skim-milk, which was found by the analyst to be deficient in butter-fat to the extent of 60 per cent. An information was laid under the 6th section, alleging that Collins had sold the milk to the prejudice of the purchaser, which was not of the nature, substance, and quality demanded. One of the Metropolitan police magistrates, before whom the case came, refused to convict on the ground that Collins had committed no offence within the 6th section, inasmuch as Lane had asked for milk and got milk, but milk which had been skimmed, and this decision was upheld on appeal. Clearly the proceedings should have been taken under section 9, which provides that "no person shall, with intent that the same may be sold in its altered state without notice, extract from any article of food any part of it, so as to effect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration."

The case of Pain *v.* Boughtwood, 24 Q. B. D. 354, decided last year on a case under this section, is worthy of mention as a decision that a person selling the altered article can be convicted under this section, although at the time that he sold it he did not know of the alteration. In that case (also a milk case) no evidence was given that the person selling the milk had knowledge of the alteration. The respondent, and his daughter who had sold the milk, gave evidence that they had no knowledge of the alteration in the milk. The magistrate was of opinion, that as section 9 con-

templated disclosure by the seller of the alteration of any article of food, it was necessary to prove knowledge by the defendent or his agent of such alteration, and he therefore dismissed the summons. But on appeal the case was remitted. Justice Charles said: "I think that this case is concluded by Betts *v.* Armstead, though but for that decision I should have entertained some doubt on the case before us." Justice Grantham in the course of his judgment, said section 9 "is aimed, first, at any person who, with intent that the same may be sold in its altered state, without notice abstracts from any article of food or any part of it, so as to affect injuriously its quality, substance or nature; and secondly, at the person who sells the article so altered without making disclosure of the alteration. But for the provisions of the second part of the section the first part would be useless as a protection to the public. The Legislature, however, saw that the provisions of the second part might have serious consequences to the person who sold the article so altered, and by section 25 the seller is given the power of protecting and exonerating himself by obtaining a written warranty from the person who has supplied the article to him. In the present case the respondent ought to have provided himself with a written warranty, and then he could have handed it to the inspector, who could have thereupon proceeded against the person who had actually committed the fraud. If that course is not taken the Legislature assumes that the seller has been a party to what has been done. Every precaution is taken in the statute to enable a person honestly selling an article without knowledge of the alteration to defend himself against a charge made under section 9."

Where a person therefore has innocently sold an

article in an altered state within the 9th section, he is nevertheless guilty of an offence, and liable to conviction unless he has a written warranty within the meaning of the 25th section. A difficulty often arises as to what document amounts to a written warranty. In Roch *v.* Hopley, 3 Ex. D. 209, the warranty by means of which the defendant sought to discharge himself from the prosecution was an invoice containing a mere description of the article as lard No. 1, and it held that a note or invoice was insufficient, and did not amount to a warranty, but was merely a description.

In Harris *v.* May, 12 Q. B. D. 97, the defendant produced an agreement which he contended was a written warranty within the meaning of the section. The agreement purported to be a contract for the supply of milk between a farmer and the defendant, under which the farmer agreed to sell the defendant 86 imperial gallons of new and pure milk each and every day. No separate invoice or warranty was given with each lot of milk as it was delivered, and the magistrate before whom the case came decided that the agreement was a contract for the sale of milk, but not a warranty within the meaning of section 25, and convicted the defendant. On the appeal the conviction was affirmed. Lord Chief Justice Coleridge in giving judgment said, "the enacting part here is plain; if a written warranty can be produced and the article identified this will be a defence. But I think this means that if a seller wishes to be safe he must be able to get a written warranty in respect of the "specific" article sold. Here then was nothing of the kind. All that appeared was that a contract had been made, and no doubt there was a general obligation to send new and pure milk every day, but that is not a written warranty and no defence under the statute."

The case of the Farmers Company *v.* Stevenson (54 J. P. 708) shows how such a contract for the supply of milk can be so utilized so as to amount to a warranty. There there was a contract for the daily supply of genuine new milk of the best quality with all its cream on, by which the vendor warranted each supply of milk to be pure, genuine and unadulterated, and attached to the churn which contained the milk, part of which was taken for analysis, was a label bearing the words "warranted genuine new milk with all its cream on." It was held that the contract and the label together constituted a written warranty within the meaning of the section.

Order of the procedure under the Act.—The person purchasing any article with the intention of submitting the same to analysis shall, after the purchase shall have been completed, forthwith notify to the seller or his agent selling the article his intention to have the same analysed by the public analyst, and shall offer to divide the article into three parts to be then and there sepated, and each part to be marked and sealed or fastened up in such a manner as its nature will permit, and shall, if required to do so, proceed accordingly, and shall deliver one of the parts to the seller or his agent.

He shall afterwards retain one of the said parts for future comparison and submit the third part, if he deems it right to have the article analysed, to the analyst.

If the seller or his agent do not accept the offer of the purchaser to divide the article purchased in his presence, the analyst receiving the article for analysis shall divide the same into two parts, and shall seal or fasten up one of those parts and shall cause it to be delivered, either upon receipt of the sample or when he supplies his certificate to the purchaser, who shall retain the same for

production in case proceedings shall afterwards be taken in the matter.

The inspector or other officer making the purchase must exercise great care in carrying out this section, using the words of the clause.

Thus, in the case of Barnes *v.* Chipp, L. R. 3 Ex. D. 176, 47 L. J. 85, it was decided that the notification required to be given by the purchaser to the seller under this section, viz.:—"that the sample had been purchased for the purpose of having it analysed by the public analyst" is a condition precedent to a prosecution under this Act.

The following is a useful form of notice to the seller or his agent:—

TAKE NOTICE that it is my intention to have the ARTICLE NOW PURCHASED by me from you ANALYSED by the PUBLIC ANALYST, at , and I shall offer to divide that article into three parts to be now and at the place of such purchase separated, and each part to be marked and sealed or fastened up in such a manner as its nature will permit, and that I shall if required to do so proceed accordingly, and shall deliver one of the parts to you.

Under the principle Act, it has been held, that an inspector purchasing samples of food or drug for the purpose of analysis, could "not" be prejudiced by the sale. Section 3 of the Amendment Act, 1879, provides that such a plea is no defence, and the words nature, substance, and quality are made disjunctive.

An inspector may, under section 3 of the Amendment Act, take samples of milk at the place of delivery, for the purpose of submitting it to the analyst in all respects as if he had purchased it from the seller as provided under section 13 of the principal Act.

In procuring samples of milk in the street, the officer

should obtain the sample when the dealer is stopping at any house for the purpose of delivering milk to a customer, and not while the milk is in course of transit, or while the milk is in course of delivery at a railway station or terminus to which the consignor has contracted to deliver the same.

Section 4 of the Amendment Act provides that the seller, or consignor or any person or persons entrusted by him for the time being with the charge of milk shall allow the officer to take the quantity required for the purpose of analysis under a penalty of £10 for refusal.

The inspector is required by Section 10 of the above mentioned Act to take legal proceedings (if any) in respect of "perishable articles" within 28 days of the date of purchase.

Form of Analyst Certificate.

To

I, the undersigned, public analyst for the
do hereby certify that I received on the day of
18 , from a sample of
for analysis (which then weighed) and have analysed the same, and declare the result of my analysis to be as follows:—

I am of opinion that the same is a sample of genuine

or

I am of opinion that the said sample contained the parts as under, or the percentages of foreign ingredients as under.

Observations.

As witness my hand this day of

A.B.,

at

As the inspector under the Sale of Food and Drugs Act is often in want of information as to the proper quantities to purchase in emergency of such articles, in order to comply with Section 6 of the Act, I have appended a list of articles, with the quantities required for analysis in each case.

Food.

Butter	1 lb.
Bread	4 ,,
Flour	2 ,,
Oatmeal	1 ,,
Coffee	½ ,,
Tea	¼ ,,
Lard	1 ,,
Mustard	¼ ,,
Chicory	¼ ,,
Pepper	2 oz. (minimum).
Vinegar	1 pint ,,
Spirits	1 ,, ,,
Beer	1 gallon.
Milk	1½ pints (minimum 1 pint).
Aerated Waters	3 bottles.

Drugs.

Sweet Spirits of Nitre	4 oz.
Precipitated Sulphur	2 ,,
Citric Acid	4 ,,
Cream of Tartar	2 ,,
Tinctures	4 ,,

Medicines according to prescriptions.

THE FOLLOWING IS A SUMMARY OF THE MARGARINE ACT, 1887.

By this Act, which came into force on the 1st of January, 1888, further provision has been made for protecting the public against the sale of Margarine as Butter, and all substances, whether compounds or otherwise, prepared in imitation of Butter, and whether mixed with Butter or not. It is not lawful to sell any such substance except under the name of Margarine, and under the conditions set forth in the Act. Butter is defined by the Act as meaning "the substance usually known as Butter, made exclusively from milk or cream, or both, with or without salt or other preservative, and with or without the addition of colouring matter,"

These conditions are that every package, whether open or closed, containing Margarine shall be branded or durably marked "Margarine" on the bottom, top, and sides in printed capital letters, not less than three-quarters of an inch square; that if Margarine is exposed for sale by retail there shall be attached to every parcel of it so exposed, and in such a manner as to be clearly visible to the purchaser, a label marked "Margarine" in printed capital letters not less than one and half inches square; and that every person selling Margarine by retail, except in a package duly branded and marked in accordance with the above directions, shall in every case deliver the same to the purchaser in or with a paper wrapper on which "Margarine" is printed in capital letters not less than a quarter of an inch square.

All imported Margarine, and all Margarine, whether imported or manufactured in this country, whenever forwarded by any public conveyance, is required by the Act to be duly consigned as Margarine; and any Medical Officer of Health, Inspector of Nuisances, or Police Constable authorised under section 15 of the Sale of Food and Drugs Act, 1875, to procure samples for analysis, may if he has any reason to believe that the provisions of the Act are infringed in this behalf, examine and take samples from any package, and ascertain, if necessary, by submitting the same to be analysed, whether an offence has been committed against the Act.

Any Officer authorised to take samples under the Sale of Food and Drugs Act, may, without going through the form of purchase provided by that Act, but otherwise acting in all respects in accordance with the provisions of that Act as to dealing with samples, take for the purposes of analysis samples of any Butter, or substances purporting to be Butter, which are exposed for sale, and are not marked "Margarine" as provided by the Act, and any such substance not being so marked will be presumed to be exposed for sale as Butter.

Every person dealing in Margarine who is found guilty of an offence under the Act will be liable on summary conviction for the first offence, to a fine not exceeding £20; for the second offence, to a fine not exceeding £50; and for the third, or any subsequent offence, to a fine not exceeding £100.

Where an employer is charged with an offence against the Act, he shall be entitled upon information duly laid by him, to have any other person whom he charges as the actual offender brought before the Court at the time appointed for hearing the charge; and if, after the commission of the offence has been proved, the employer proves to the satisfaction of the Court that he had used due diligence to enforce the execution of the Act, and that the other person whom he charges had committed the offence in question without his knowledge, consent or connivance, such other person is to be summarily convicted of the offence, and the employer is to be exempt from any penalty.

Every person dealing with, selling, or exposing or offering for sale, or having in his possession for the purpose of sale, any quantity of Margarine contrary to the provisions of the Act, shall be liable to conviction for an offence under the Act, unless he shows to the satisfaction of the Court before whom he is charged that he purchased the article in question as Butter, and with a written warranty or invoice to that effect, that he had no reason to believe at the time when he sold it that the article was other than Butter, and that he sold it in the same state as when he purchased it; and in such case he is to be discharged from the prosecution, but to be liable to pay the costs incurred by the prosecutor, unless he has given due notice to him that he will rely on the above defence.

MODEL BYE-LAWS OF THE LOCAL GOVERNMENT BOARD, UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

Bye-Laws

For the Prevention of Nuisances arising from any Snow, Ice, Salt, Dust, Ashes, Rubbish, Offal, Carrion, Fish, or Filth, or other Matter or thing in any Street.

2. The occupier of any premises fronting, adjoining, or abutting on any street *not repairable by the inhabitants at large* shall, as soon as conveniently may be after the cessation of any fall of snow, remove or cause to be removed from the footways and pavements adjoining such premises all snow fallen or accumulated on such footways and pavements in such a manner and with such precautions as will prevent any undue accumulation in any channel or carriageway or upon any paved crossing.

In the case of any premises, the person in occupation of or having the charge, management, or control of the same, or if there is no such person, then any person in occupation of or having the charge, maintenance or control of any part of the premises, and in the case of any premises the whole of which are let to lodgers, the person receiving the rent payable by the tenants or lodgers, either on his own account or as the agent of another person, shall for the purposes of this bye-law be deemed to be the occupier.

2. Every person who shall remove any snow from any premises shall deposit the same in such a manner and with such precautions as to prevent any accumulation thereof in any channel or upon any paved crossing.

If in the process of such removal any snow be deposited upon any footway or pavement, he shall forthwith remove such snow from such footway or pavement.

3. Every person who shall throw any salt upon any snow on the footway of any street shall do so in such quantity and in such manner as effectually to dissolve the whole of such snow, and he shall forthwith effectually remove from the footway the whole of the deposit resulting from the mixture of the salt with the snow. He shall

not place any part of such deposit on the carriageway of such street other than any channel at the side of such carriageway, and he shall not remove the same into any such channel unless it is sufficiently liquid to flow along such channel.

No person shall throw any salt upon any snow on the carriageway of any street, unless it shall be practicable forthwith effectually to remove from such carriageway the whole of the deposit resulting from the mixture of the salt with the snow. He shall forthwith effectually remove the whole of such deposit, but he shall not place any part thereof on the footway of such street, nor shall he place any part thereof in the channel at the side of the carriageway, unless it is sufficiently liquid to flow along such channel.

4. The occupier of any premises who shall remove or cause to be removed any dust, ashes, rubbish, offal, carrion, fish in an offensive condition, or filth or other like matter or thing from his premises, shall for the purpose of such removal in every case use or cause to be used a suitable vessel or receptacle, cart, or carriage properly constructed and furnished with a sufficient covering, so as to prevent the escape of the contents thereof.

If in the process of such removal any person shall slop or spill, or cause or allow to fall upon any footway, pavement, or carriageway, any such dust, ashes, rubbish, offal, carrion, fish in an offensive condition, or filth or other like matter or thing, he shall forthwith remove such dust, ashes, rubbish, offal, carrion, fish, or filth or other matter or thing from the place whereon the same may have been slopped or spilled, or may have fallen, and shall immediately thereafter thoroughly sweep or otherwise thoroughly cleanse such place.

5. Every person who shall lay or cause to be laid in any street any litter or other matter in case of sickness to prevent noise shall lay the same so that it may be evenly distributed over the surface of the part of the street intended to be covered, and shall, when the occasion ceases, remove or cause to be removed from such street the litter or other matter so laid in such street.

For preventing nuisances arising from any offensive matter running out of any manufactory, brewery, slaughter house, knacker's yard, butcher's or fishmonger's shop, or dunghill, into any uncovered place, whether or not surrounded by a wall or fence.

6. The occupier of a manufactory, brewery, slaughter house, knacker's yard, butcher's or fishmonger's shop, or of any premises

comprising a dunghill shall not cause or suffer any offensive matter to run out of such manufactory, brewery, slaughter house, knacker's yard, butcher's or fishmonger's shop, or dunghill, into any uncovered place, whether or not surrounded by a wall or fence so as to be likely to become a nuisance.

For the prevention of the keeping of animals on any premises so as to be a nuisance or injurious or dangerous to health.

7. The occupier of any premises shall not keep any animal on such premises in such a place or in such a manner as to pollute, or to be likely to pollute any water supplied for use or used or likely to be used by man for drinking or domestic purposes, or for manufacturing drink for the use of man, or any water used or likely to be used in any dairy.

8. Every occupier of a building or premises wherein or whereon any horse or any other beast of draught or burden, or any cattle or swine may be kept, shall provide, in connection with such building or premises, a suitable receptacle for dung, manure, soil, filth, or other offensive or noxious matter which may, from time to time, be produced in the keeping of any such animal in such building or upon such premises.

He shall cause such receptacle to be constructed so that the bottom or floor thereof shall not, in any case, be lower than the surface of the ground adjoining such receptacle.

He shall also cause such receptacle to be constructed in such a manner and of such materials, and to be maintained at all times in such a condition as to prevent any escape of the contents thereof, or any soakage therefrom into the ground or into the wall of any building.

He shall cause such receptacle to be furnished with a suitable cover, and, when not required to be open, to be kept properly covered.

He shall likewise provide in connection with such building or premises a sufficient drain, constructed in such a manner, and of such materials, and maintained at all times in such a condition, as effectually to convey all urine or liquid filth, or refuse therefrom, into a sewer, or other proper receptacle.

He shall, once at least in every week, remove or cause to be removed from the receptacle provided in accordance with the requirements of this bye-law all dung, manure, soil, filth, or other offensive or noxious matter, produced in or upon such building or premises, and deposited in such receptacle.

As to the paving of yards and open spaces in connection with dwelling houses.

9. The owner of every dwelling house in connection with which there is any yard or open space, shall, where it is necessary for the prevention or remedy of insanitary conditions that all or part of such yard or open space shall be paved, forthwith cause the same to be properly paved with a hard, durable, and impervious pavement, evenly and closely laid upon a sufficient bed of good concrete, and so sloped to a properly constructed channel as effectually to carry off all rain or waste water therefrom.

Penalties.

10. Every person who shall offend against any of the foregoing bye-laws shall be liable for every such offence to a penalty of five pounds, and in the case of a continuing offence to a further penalty of forty shillings for each day after written notice of the offence from the Sanitary Authority.

Provided, nevertheless, that the justices or court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this bye-law.

With respect to the keeping of Waterclosets supplied with sufficient Water for their effective Action.

1. The occupier of any premises in or for which any watercloset shall be provided, shall cause such watercloset to be at all times properly supplied with a sufficient quantity of water for securing its effective action.

Where, however, any watercloset is provided for the use of persons occupying two or more separately occupied premises, and there is a person having the care and control of such watercloset, the foregoing requirements shall apply to such person.

Penalties.

2. Every person who shall offend against the foregoing bye-law, shall be liable for every such offence to a penalty of five pounds, and

in the case of a continuing offence to a further penalty of forty shillings for each day after written notice of the offence from the Sanitary Authority.

Provided, nevertheless, that the justices or court before whom any complaint may be made, or any proceedings may be taken in respect of any such offence, may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this bye-law.

For securing the Cleanliness and Freedom from Pollution of Tanks, Cisterns, and other Receptacles used for storing of Water used or likely to be used by Man for Drinking, or Domestic Purposes, or for Manufacturing Drink for the Use of Man.

1. The occupier of any premises on which a tank, cistern, or other receptacle is used for storing of water used or likely to be used by man for drinking or domestic purposes, or for manufacturing drink for the use of man, shall empty and cleanse the same, or cause the same to be emptied and cleansed, once at least in every six months, and at such other times as may be necessary to keep the same in a cleanly state and free from pollution.

He shall cause every such tank, cistern, or other receptacle which is erected outside a building, or which, being erected inside a building, is not placed in a suitable chamber, or otherwise constructed or placed so as to prevent the pollution of the water therein, to be provided with a proper cover, and to be kept at all times properly covered.

Provided that in every case where two or more tenants of any premises are entitled to the use in common of any tank, cistern, or other receptacle used for storing of water used or likely to be used by man for drinking or domestic purposes, or for manufacturing drink for the use of man, the foregoing requirements shall apply to the owner of such premises instead of to any occupier thereof.

Penalties.

2. Every person who shall offend against the foregoing bye-law, shall be liable for every such offence to a penalty of five pounds, and in the case of a continuing offence to a further penalty of forty shillings for each day after written notice of the offence from the Sanitary Authority.

Provided, nevertheless, that the justices or court before whom any complaint may be made or any proceedings may be taken in respect of any such offence, may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this bye-law.

THE SUPERANNUATION ALLOWANCES (MET.) ACT, 1866.

SECTION 1.—The vestry of any parish and district board of any district or other parochial body within the metropolis, and also the Metropolitan Board of Works "may," at their discretion, grant to any officer in their respective services, including the chairman of the metropolitan board of works, who shall become incapable of discharging the duties of his office with efficiency by reason of permanent infirmity of mind or body, or of old age, upon his resigning or otherwise ceasing to hold office, an annual allowance "not exceeding in any case two-thirds" of his then salary, regard being had to the scale of allowances hereinafter contained, and shall charge such allowance to the fund or funds to which such salary would have been charged if he had continued in his office; provided always, that nothing in this Act contained shall affect the powers contained in the two hundred and thirteenth section of the "Metropolis Management Act, 1855."

SECTION 2.—This allowance shall be payable to or in trust for such officer only, and shall not be assignable for nor chargeable with his debts or other liabilities without the consent in writing of the vestry, district board, metropolitan board of works, or other parochial body.

SECTION 3.—No officer shall be entitled to such allowance on the ground of old age who shall not have completed the full age of sixty years.

SECTION 4.—Subject to the provisions herein contained, the allowance to be granted after the commencement of this Act to persons who shall have served in an established capacity as officers as aforesaid, whether their remuneration be computed by weekly wages,

poundage, or percentage on collection of rates, or annual salary, shall be as follows, that is to say:—To any person who shall have served ten years and upwards, and under eleven years, an annual allowance of ten-sixtieths of the salary and emoluments of his office.

And in like manner an addition of one-sixtieth in respect of each additional year for such service until the completion of a period of service of forty years, when the annual allowance of forty-sixtieths may be granted; and no addition shall be made in respect of any service beyond forty years; but in computing the time of an officer's service any period during which such officer shall have been in the service of a vestry, board of trustees, or other parochial board of the "same parish," superseded by the "Metropolis Management Act, 1855" or of any parish comprised in the district board granting such allowance, shall be included.

SECTION 5.—When for the due and efficient discharge of the duties of any office professional or other peculiar qualifications not ordinarily to be acquired in the vestry or board's service are required, and any person having such qualifications shall have been or may be appointed thereto beyond the age of thirty years, any vestry or board may, by order direct that when any person now holding or who may hereafter be appointed to such office shall retire from their service, a number of years, not exceeding ten, to be specified in the said order, shall in computing the amount of superannuation allowance which may be granted to him under this Act, be added to the number of years during which he may have actually served.

SECTION 6.—Any vestry or board or other parochial body may grant any person who is compelled to quit their service by reason of severe bodily injury occasioned, without his own default, in the discharge of his public duty, or from infirmity of mind or body, before the completion of the period which would entitle him to superannuation allowance, a gratuity not exceeding three months pay for every two years of service.

SECTION 7.—No grant shall be made without one month's previous notice, to be specially given in writing to every member of the vestry or district board, of the proposal to make such grant, and the time when it shall be brought forward.

INDEX.

SELECTED LIST OF BOOKS

IN

GENERAL LITERATURE

PUBLISHED BY H. K. LEWIS,

136 GOWER STREET, LONDON, W.C.

ESTABLISHED 1844.

THE SANITARY INSPECTOR'S HANDBOOK

and Textbook for Students preparing for the Examinations of the Sanitary Institute, London. By ALBERT TAYLOR, Assoc. San. Inst., Holder of the Inspector of Nuisances Certificate of the Sanitary Institute; Chief Sanitary Inspector to the Vestry of St. George, Hanover Square, London. With Illustrations, cr. 8vo. [*In preparation.*

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By J. JAMES RIDGE, M.D., and M.D. (State Medicine) Lond., B.S., B.A., B.Sc. Lond., Medical Officer of Health, Enfield. Second Edition, cr. 8vo, 2s.

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