APPENDIX.

THE SANITARY INSTITUTE.

FOUNDED 1876. INCORPORATED 1888.

DESCRIPTIVE CATALOGUE

OF

THE PARKES MUSEUM.

MAINTAINED BY

THE SANITARY INSTITUTE.

Offices of the Institute:
74A. MARGARET STREET, LONDON, W.

August 1891

PREFACE.

THE PARKES MUSEUM was founded at a meeting presided over by Sir William Jenner, Bart., M.D., F.R.S., on June 18th, 1876, in memory of the late Edmund Alexander Parkes, who was the first Professor of Hygiene in this country. He was appointed to the Army Medical School, established in 1860, by the late Lord Herbert of Lea.

Her Majesty the Queen and other members of the Royal Family were among the first subscribers to the funds of the new Institution.

In 1877 the Council of University College placed commodious galleries at the disposal of the Committee of the Museum. These galleries were soon filled with objects illustrating various branches of the Science of Hygiene, and, on June 28th, 1879, the Museum was formally opened to the public by the Right Hon. Sir R. A. Cross, G.C.B., Secretary of State for the Home Department.

In 1880 a public meeting was held at the Mansion House, under the presidency of the Lord Mayor, in support of the Museum. This meeting led to a considerable increase in the number of subscribers, and several of the City Companies contributed to the funds of the Museum. A second meeting was held in 1885.

In 1881, on the occasion of the meeting of the International Medical Congress in London, the Committee of the Museum organised the International Medical and Sanitary Exhibition, which was held at South Kensington, in the buildings of the Commissioners of 1851. This Exhibition was the first of its kind in London, and was the precursor of the great Health Exhibition of 1884.

In 1882 the Museum was incorporated, and His Royal Highness the late Duke of Albany became its first President. As, however, the Council of University College now required, for other purposes, the Galleries they

had lent to the Museum Committee, it became necessary to make new arrangements for housing the collection, which had, by this time, considerably increased. The Museum was accordingly removed to the new premises in Margaret Street. About £1,500 were expended in adapting the premises to the requirements of the Museum, the drainage and other arrangements of the building being especially designed and constructed so as to be available for teaching purposes.

In 1883, on the 26th of May, the President, His Royal Highness the Duke of Albany, opened the Museum in its new premises and delivered an address, of which the following were the concluding words: "Our endeavour will be to make the Parkes Museum in every way worthy of the man whose name it bears. To do this, we look for the ungrudging and cordial support of all who are interested in sanitary progress. If such support be accorded us we may fairly hope that the Museum will help materially in the dissemination of that branch of knowledge which, in the words of Dr. Parkes, aims at rendering growth more perfect, decay less rapid, life more vigorous, and death more remote."

The first year during which the Museum occupied its new premises was mournfully marked by the death of its President, an event which was a serious blow to the progress of the Institution, for His Royal Highness had the interests of the Museum deeply at heart, and spared no effort to render it worthy of the objects for which it was established.

A large number of Practical Demonstrations and Lectures have been given from time to time in the Museum.

In 1886 courses of training Lectures suitable for Students preparing for the Examinations of the Sanitary Institute were established and carried on with great success.

On August, 1888, the Parkes Museum was amalgamated with the Sanitary Institute of Great Britain and incorporated under the title of The Sanitary Institute, the Memorandum of Association providing for "The maintenance in London, or elsewhere in the United Kingdom, of a Museum of Hygiene to be called the Parkes Museum, to aid in the Scientific investigation and practical study of all matters relating to health and the laws thereof, and subject to sub-section (E), as a permanent memorial of the late Edmund Alexander Parkes, M.D., F.R.C.P., F.R.S."

The Museum has considerably developed, and a handsome donation from Mr. Rogers Field, M.INST.C.E., has enabled the Council to produce this catalogue and to make considerable re-arrangement of and addition

to the exhibits. A sketch plan of the Museum is given in the catalogue shewing the position of the various classes of exhibits.

The Museum is open free to the public from 10 a.m. to 6 p.m., and on Mondays from 10 a.m. to 8 p.m.

The whole purpose of the Museum is to serve as a means of practical demonstration and teaching for Sanitary Science, and is not designed as an attractive Exhibition. Many of the exhibits are introduced to illustrate defects in material or construction, others are selected to illustrate rather the class they represent than any special merits of any one particular make, but for the guidance of those seeking such information a pamphlet is published containing a list of appliances which have been approved by the Judges, and premiated at the Exhibitions held under the auspices of the Sanitary Institute.

The size and scope of the present building is far below what is felt to be desirable, and even necessary, for the complete demonstration of practical Hygiene, but as the Museum is not in any way subsidised by the State, and is supported entirely by the donations and subscriptions of private members, the Council are much encouraged by the progress already made, and hope that in the future it may grow into a still more useful and representative Institution.

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PLANS, &c.

CLASSIFICATION.

DIVISION A.

Science in Relation to Hygiene.

Anthropology.
Bacteriology.
Chemistry.
Demography.
Geology.
Medicine (Preventive).
Meteorology.
Microscopy.
Physics.
Physiology.

DIVISION B.

Hygiene of Special Classes, Trades and Professions.

Schools.
Various Trades and Manufactures
Hospitals.
Prisons.
Barracks and Camps
Ships.
Workhouses and Asylums.
Artizans' Dwellings.
Municipalities.
Burial of the Dead, Cremation, and other means of disposal.
Prevention of Accidents.
Prevention of Fires.

DIVISION C.

Construction and Sanitary Apparatus.

CLASS I.—Building Materials, Construction and Machinery.

Materials and Construction.
Damp-proof Courses.
Paints and other Protectives.
Wall Papers and Coverings.
Flooring.
Decorative Materials.
Machinery & Mechanical Appliances
Laundry Appliances.

CLASS II.—Water Supply and Sewerage.

Apparatus for Water Supply.
Filtering and Softening Water.
Water Waste Preventers.
Flushing and Watering.
Sinks.
Baths and Lavatories.
Water Closets.
Urinals.
Sewers, Drain Pipes and accessories.
Traps and Gulleys.
Dry Closets.
Sewage Treatment.
Miscellaneous Sanitary Goods.

CLASS III.—Heating, Lighting and Ventilating.

Heating Apparatus.
Cooking Apparatus.
Smoke-preventing Appliances.
Lighting, including Electric Lighting.
Ventilating Gas Burners.
Ventilators.

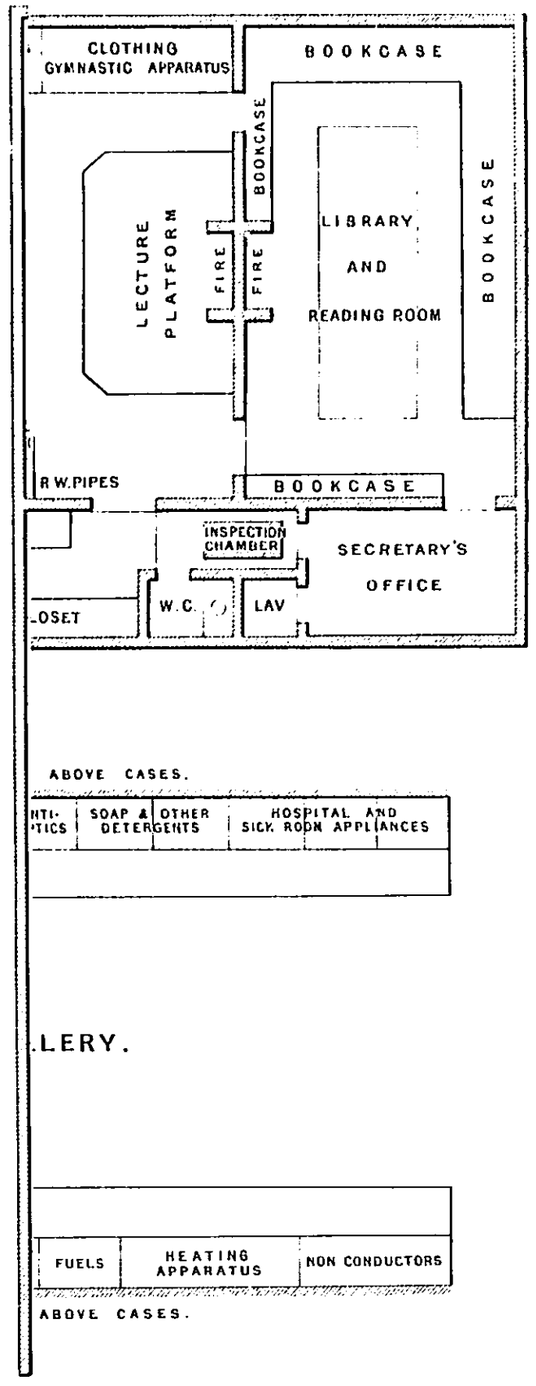
DIVISION D.

Personal and Domestic Hygiene.

Clothing.
Beds and other Furniture.
Hospital and Sick Room Appliances.
Domestic Appliances.
School Fittings.
Gymnastic Apparatus.
Foods.
Domestic Filters.
Mineral Waters.
Soaps and other Detergents.
Antiseptics and Disinfectants.
Disinfecting Apparatus.

NOTE.

The Exhibits placed in the Museum are selected for their utility for the purpose of demonstrating and teaching Sanitary Science, and it does not necessarily follow that all the arrangements and appliances are good, some bad forms being exhibited to illustrate certain principles.



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A BOOT & SON, LITH OLD BAILEY E.C

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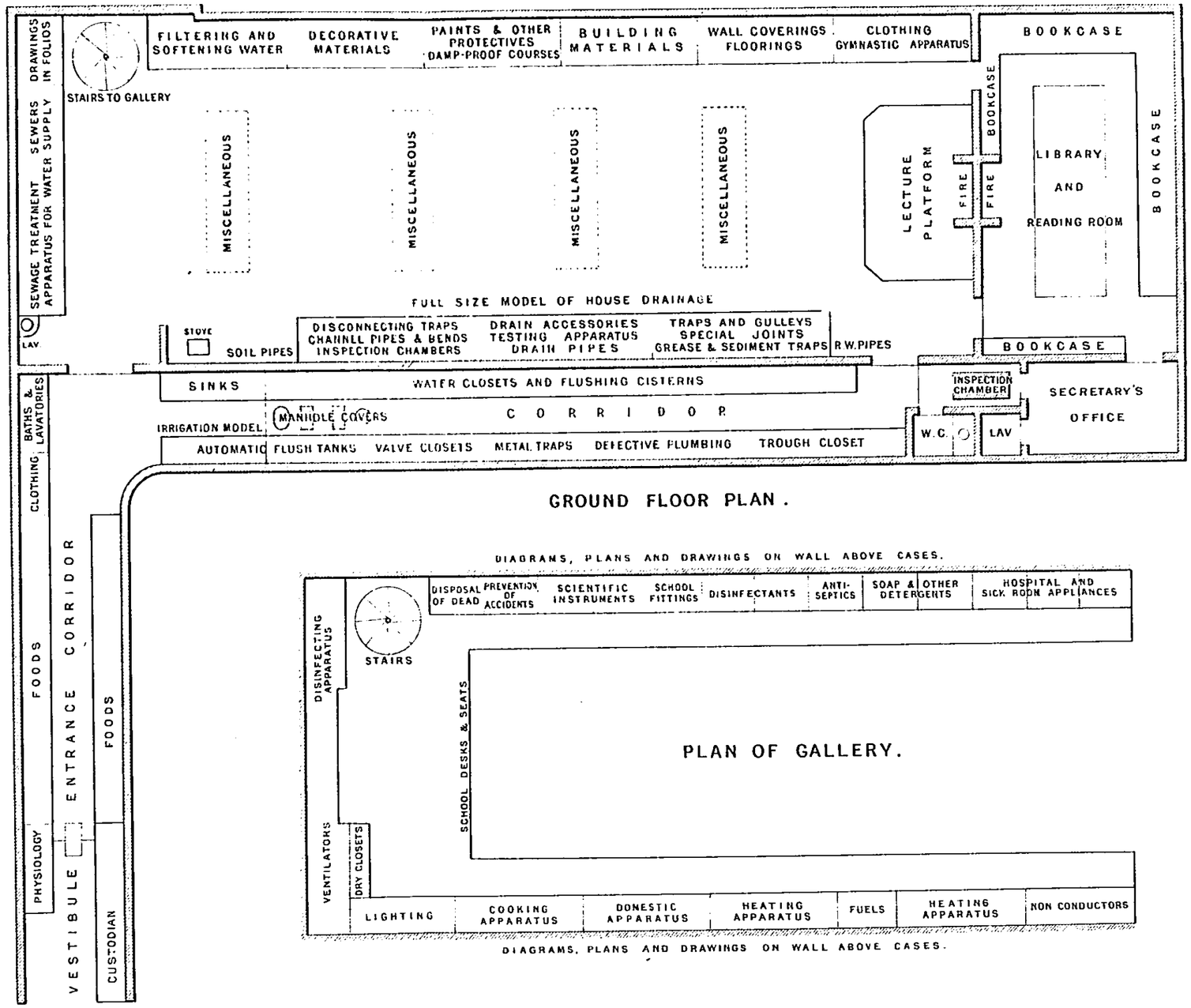

GROUND FLOOR PLAN.

PLAN OF MUSEUM.

A. BOOT & SON, LITH. OLD BAILEY E.C.

CATALOGUE.

DIVISION A.

SCIENCE IN RELATION TO HYGIENE.

THIS DIVISION INCLUDES THE FOLLOWING :

Anthropology.	Medicine (Preventive).
Bacteriology.	Meteorology.
Chemistry.	Microscopy.
Demography.	Physics.
Geology.	Physiology.

1 **Gas Gauge** (Sugg's), for indicating the pressure of gas.

2 **Thermometer,** in metal case, indicating up to 220° Far.

3 **Floating Thermometer,** used for indicating low temperatures of liquids, such as milk.

4 **Spirit Level**, ordinary

5 **Pressure Gauges,** used for testing purposes.

6 **Gradient Indicator, Adjustable** (Moss Flower's), for laying drains sewers, &c., at any required fall, used in conjunction with a long straight edge. *T. J. Moss Flower.*

7 **Creamometer,** for indicating the percentage of cream raised from milk. *Thos. Bradford and Co.*

8 **Lactometer,** for testing the specific gravity of milk. *Thos. Bradford and Co.*

9 **Pyrometer** (Bailey's), for indicating temperatures of air, used for testing gas stoves, disinfecting apparatus, &c.

10 **Pyrometer** (Cassella's), for indicating temperatures of air, used for testing gas stoves, &c.

11 **Measure, Imperial Quart,** used for testing purposes.

12 **Stop Watch,** used for testing purposes.

13 **Gas Meter,** specially designed for testing purposes, indicating the smallest quantity of gas used.

14 **Equipment for Ordinary Meteorological Station.**

A. Copper Rain Gauge, "Snowdon pattern," 5-inches in diameter, with a deep funnel for the collection of snow. This is usually placed with rim of the funnel one foot above the surface of the ground, preferably on grass.

NOTE.—The names of the donors are placed in italics after the description of each Exhibit.

B. Measuring Glass, into which the contents of the gauge are poured. The highest graduation marked 50 on the glass representing .50 or ½ an inch of rain over the surface of the funnel.

C. Stevenson's Thermometer Screen, for protecting thermometers from direct or reflected rays of the sun, and from wind. This should be placed on legs so that the thermometers are four feet above the ground, and with the door of the screen facing north.

D. Self-Registering Maximum Thermometer. A small quantity of air is introduced in the column of mercury, which separates about two inches of the column This separated portion is pushed up when the temperature rises and remains at its highest point until shaken down by hand.

E. Self-Registering Minimum Thermometer. A small black index is placed in the column of spirit, which is drawn down as the temperature decreases, but with an increase of temperature the spirit passes and leaves it in position.

F. Dry and Wet Bulb Hygrometer, for ascertaining the humidity of the air; one bulb is exposed directly to the air, the other is covered with a piece of muslin, which is kept damp by a small lamp wick. The evaporation from the muslin cools the thermometer more or less according to the rapidity of the evaporation, and the rate of the evaporation depends upon the humidity of the air, so the difference of temperature between the two thermometers shows the humidity of the air. *L. Casella.*

15 **Sanitary Institute Bronze Medal.** The highest award given by the Institute for articles adjudged to be of special merit by the appointed judges at any of the Institute's Exhibitions.

16 **Sanitary Institute Exhibition Certificate** (framed), showing the form of certificate awarded by the Sanitary Institute for articles of merit exhibited at any of the Institute's Exhibitions.

17 **Sanitary Institute Certificate** for Domestic Hygiene. Lectures for Ladies.

18 **Sanitary Institute Examination Certificate** (framed), showing the form of certificate presented to candidates, who, on examination by the appointed examiners, satisfy them of their competency to undertake the duties of Sanitary Inspectors or Local Surveyors.

19 **Demonstration, Models.** "The Hygiene Cabinet," containing specimens, apparatus and models of sanitary appliances for teaching the general principles and practically demonstrating lectures on Hygiene and Sanitary Science. *Chas. Campbell.*

20 **Demonstration, Model.** Designed by W. H. Knight. A working model in glass representing two closets, soil pipe, house drain, intercepting trap, and drain to sewer. Designed to illustrate several points in reference to ventilation and trap siphonage.

DIVISION B.

HYGIENE OF SPECIAL CLASSES, TRADES AND PROFESSIONS.

THIS DIVISION INCLUDES THE FOLLOWING:—

Schools.
Various Trades and Manufactures.
Hospitals.
Prisons.
Barracks and Camps.
Ships.
Workhouses and Asylums.
Artizan Dwellings.
Municipalities.
Burial of the Dead, Cremation and other means of disposal.
Prevention of Accidents.
Prevention of Fires.

30 **Dwellings for Artizans, Three-roomed** (two plans) showing separate street entrances, yards, and scullery. *M. H. Judge.*

31 **Model Dwellings** (plan and elevation) as erected at Walworth. *Thos. Chatfield Clarke*, F.R.I.B.A.

32 **Hospital, Lying-in, Madras** (plan and elevation). *R. Chisholm*, F.R.I.B.A.

33 **Torquay** (aërial perspective map), with photographs showing principal physical and architectural features, climatic tables, and details of sewerage and water supply.

34 **Drawings** classified in groups, mostly saved from the fire of the Twickenham Museum, as collected and presented by *T. Twining.*

These drawings are collected in the following FOLIOS—

Folio A.—HOMES, ASYLUMS AND HOSPITALS: The Chalmers Hospital, Banff; Hospital Lariboisiere, Paris; Hospital, Bordeaux; Lunatic Asylum, Brentwood; Hotel Dieu, Paris; Military Hospital, Vincennes; Hospital for the Insane, Coton Hill, Stafford; Workhouse, Oxford; Lunatic Asylum, Cumberland; Infirmary, Swansea; Jefferson Medical College Hospital; the Herbert Hospital; Design for small hospital; Royal Victorian Hospital, Netley; City of Glasgow Hospital, Belvidere; Hospital, Ville de Montpellier.

Folio B.—DRINKING FOUNTAINS, BATHS AND WASHHOUSES: Map of Metropolitan district, showing positions where drinking fountains had been fixed up to date; Number of drawings showing elevations of various drinking fountains and cattle-troughs; Plans and details of projected Public Baths and Lavatories for Brussels; Two drawings of Baths and Washhouses erected in the City of Glasgow.

Folio C.—HOUSE TOP UTILISATION: Showing various drawings to illustrate Dr. Dobell's scheme for utilising the roofs of houses as airing-grounds.

Folio D.—ARTIZANS' AND LABOURERS' COTTAGES: The Salopian Societies, Model Cottages; Cottage designs, by Baxendale; Labourers' Cottages, Leeds; Model Dwellings, Pelham Street; Workmen's Dwellings, Saltaire; Three-Roomed Dwellings; Pairs of Cottages; Cottage, Highgate, Photograph; Model Houses for Four and Eight Families, erected by Windsor Royal Society; Scotch Bothy; Triple Cottages; Specifications for Cottage Construction; Design for Cottages in rows; Designs from "Builder"; Thirty diagrams of Cottage Building; Copley Village; Houses adapted to Towns; Lodging House; Model Houses for Four Families; Single and Double Cottages; Noel Park Model Estate.

Folio E.—Peabody and other Dwellings for the Working Classes: Columbia Square; Westminster Working Men's Club and Lodgings; Model Dwellings, Fulham; Gatliff Buildings; Peabody Square, Islington; Thanksgiving Buildings, Portpool Lane; Peabody Buildings, Shoreditch; Peabody Square, Westminster; Peabody Buildings, Commercial Street; Incestre Buildings; Nelson Street Buildings, Bermondsey; Spicer Street Buildings; St. Pancras Buildings; Model Dwellings, Bellorini; Sharpe's Design; The Mall, Kensington; Battersea Park Buildings; King's Cross Buildings; Emperor's Design; Northumberland Buildings, Liverpool; Family Houses, St. Pancras.

Folio F.—Model Lodgings: St. Ann's Court, Soho; Kingston-upon-Hull; Two Specifications; Albert Street Chambers; Glasgow (two drawings).

Folio G.—Educational Buildings: Merchant Venturers' School; Wedgewood Memorial, Burslem; Warehousemen and Clerks' School; Finsbury District Schools; Merchant Taylors' School; The Godolphin Schools, Hammersmith; Hartley Institute, Southampton; Industrial School, Eltham; The Real School, Ofen, Hungary; The Faversham Institute; Public Hall (Soane's Prize); Schools, Walworth; Guards' Institute, Pimlico.

Folio H.—Educational Buildings: Wallraff Museum, Cologne; Hallfield School, Bradford; Field Lane Ragged School; St. Giles' National School; St. Mary's College, Harlow; Schools, Lambeth; Baptist College, Rawden; Orphanage, Broadstairs.

Folio J.—Suburban Dwellings: Edinburgh Co-operative Buildings; Metropolitan Association Buildings; Improved Dwellings, Yorkshire; Artizans' Dwellings, Halifax; Labourer's Dwellings, Leeds; Akroydon Houses; Cottages, Sharpe's; Labourer's Dwellings, Leeds; Model Buildings, Pentonville; "Four-family" Cottages; Shaftesbury Park Estate; Mechanics' Houses, Edinburgh.

Folio K.—Foreign Buildings: Campo Santo; Baths, Wien; French Model Dwellings; Working Men's Dwellings (Beaucourt); Telegraph Office *French.*

Folio L.—Crematoriums: Siemens, English Pattern; Gorini, design; Lodigiano, design; Polli Clericette, design.

Folio M.—Plans of Manholes and Service Reservoirs: A series of drawings from designs by Sir Robert Rawlinson; Plans of Baths, W.C., and drainage by H. P. Holt, Assoc.M.Inst.C.E.

Folio N.—House Sanitation: A series of drawings and plans. *W. P. Buchan.*

Folio O.—House Sanitation: A series of drawings and plans. *P. F Comber*, C.E.

Folio P.—Thames Embankment (Drawings): A complete set of contract drawings, including plans, elevations, sections, and details of the Embankment on both sides of the river, designed by the late Sir J. W. Bazalgette, C.B. *Metropolitan Board of Works.*

Folios Q. R. S.—Main Drainage. Metropolis. (Drawings): A complete set of contract drawings, including plans, elevations, sections, and details of the following works in connection with the main drainage of the Metropolis, as designed by the late Sir J. W. Bazalgette, C.B., including: South side Low-level Sewer; Southern Out-fall Works, Buildings, and Engines; North side Low-level Sewer; Northern Out-fall Reservoir; Abbey Mills Pumping Station, Buildings, &c.; Western Pumping Station, Buildings, &c. *Metropolitan Board of Works.*

Folio T.—Ventilation of War Ships: A series of drawings of H.M.S. "Agincourt," "Victor Emanuel," "Dreadnought," and Indian Troop Ships, on a large scale, illustrative of the System of Ventilation carried out on these vessels. *The Lord Commissioners of the Admiralty.*

Folio U.—Ventilation of Public Buildings.

Prisons.

35 **Convict Prison** (model) (*near platform*), showing bath rooms, latrines, &c. This building (of which one half only is shewn in model) containing 64 baths, 66 latrines, and four rooms above them was built by convict labour at the cost of £930—the cost if erected by contract is estimated at £1,350.

36 **Pentonville Convict Prison** (model), shewing ventilation air shaft and furnace, furniture fittings, gallery, hand labour mill and means for supervision.

Prevention of Accidents.

50 **Lamps,** for use in mining operations.

51 **Dog Muzzle,** wire netting.

52 **Pole Crab** (Weekes's), for facilitating the release of a fallen horse. *John Weekes.*

53 **Fire Escape** (T. J. Spencer). Two photographs, showing apparatus closed for travelling, and extended for use. *T. J. Spencer.*

54 **Respirator,** with protection for the eyes to enable the wearer to enter a room filled with smoke or noxious gasses.

55 **Reversible Window** (Millar's), for enabling the cleaning of both sashes to be done safely from inside. *Millar's Reversible Window Co.*

Prevention of Fire.

70 **Hand Grenade.** "The Harden Star," for use in the early stages of a fire. *Harden Star Hand Grenade Co.*

71 **Fire Extincteurs.** Two specimens (small and large) charged and placed in accessible positions in Museum. *Haslam Fire Extinguishing Co.*

72 **Concrete Door,** fire-proof. Fixed between Museum and Library *Lascelles and Co.*

Fire-proof Flooring (*see* Nos. 230-1-2).

Fire-resisting Slabs (Hitchen's), (*see* No. 256.)

Slag Felt. Fireproof (*see* No. 149).

Expanded Metal for Plaster (*see* No. 109).

Burial of the Dead, and Cremation.

80 **Crematorium** (model), showing the construction of the first crematorium erected in England in modern times. *J. C. Leach*, M.D.

81 **Crematoriums** (Diagrams in folio L), showing designs by Siemens, Gorini Lodigiano, Polli Clericette, and an English system.

82 **Bier.** Diagram and description of model bier. *S. Stretton.*

DIVISION C.

CONSTRUCTION AND SANITARY APPARATUS.

CLASS I.—BUILDING MATERIALS, CONSTRUCTION, AND MACHINERY.

EXHIBITS in this Class are restricted to articles which by their construction or in their composition have some bearing on health.

THE CLASS IS ARRANGED UNDER THE FOLLOWING SUB-HEADS:—

Construction.
Materials.
Damp-proof Courses.
Paints and other Protectives.
Wall Papers and Coverings.
Floorings.
Decorative Materials.
Machinery and Mechanical Appliances.
Laundry Appliances.

Construction.

100 **Window and Door Construction** (full sized model), used as an exhibition case in corridor, showing patent sash fastener and opener, accessible sash weights, door fastening and ventilation, and adjustable shelf support for bookcases. *Messrs. Tonks and Son.*

101 **Window Construction** (model). Showing arrangement adopted at St. George's Hospital for Scullery. *The Committee of Management of St. George's Hospital.*

102 **Window Construction** (model). Illustrating the arrangement carried out at the Middlesex Hospital. *The Committee of Management of the Middlesex Hospital.*

103 **Window Construction** (model). Showing the method adopted at St. Thomas' Hospital. *The Committee of Management of St. Thomas' Hospital.*

104 **Window Construction** (model). Illustrating the arrangement carried out at Guy's Hospital. *The Committee of Management of Guy's Hospital.*

105 **Window Construction** (model). Window and cupboard beneath, as fixed in the Grocers' Company's wing of the London Hospital. *The Committee of Management of the London Hospital.*

106 **Window Construction** (model), with double panes of glass to prevent the conduction of sound, and to maintain an even temperature.

107 **Window Construction** (model). *Wadmore and Baker.*

108 **Hollow Wall Construction** (two specimens) designed to prevent dampness. *G. E. Prichett*, F.S.A.

109 **Expanded Metal** (models and specimens), showing methods of fixing the metal, with plaster applied. *British Metal Expansion Company, Limited.*

111 **Door, Spring** (model).

112 **Door with Equilibrium Action** (model).

113 **Door Lock** (model). An enlarged section showing simple push and pull action. *Josh. Kaye and Sons, Limited.*

114 **Lock,** "push and pull." Fixed on Library door. *J. Kaye and Son.*

115 **Coal Plate,** with self-locking fastening. *Hayward Bros. and Eckstein.*

116 **Ventilating Lid, Duplex** (model) for Water Closets and Sinks. When shut down the space below the lid is opened to the ventilating flue that runs up the wall to the top of the building, but when the lid is raised it closes the opening to this flue. *H. Saxon Snell*, F.R.I.B.A.

117 **Ash Pan, Improved Tipping** (model). The contents of pan can be periodically collected from outside, thus obviating the necessity of the dustman entering the premises where the yard is bounded by a public road. *Holme & Arveschough's Patent.*

Brick Wall Construction (*see* No. 180).

House Drainage. Full size model, showing soil pipe, drain, and intercepting chamber construction (*see* No. 490).

Drainage of Museum, with plans of same (*see* Nos. 491-3).

(*b*) Materials.

130 **Glazed Bricks,** several specimens of glazed bricks in various colours and two specimens of dados built up. *Cliff and Sons.*

131 **String Courses** (several specimens). *Stiff and Sons.*

132 **Terra Cotta** (two balusters), red. *Stiff and Sons.*

133 **Terra Cotta Cornice,** fixed. *Doulton and Co.*

134 **Concrete** (two balusters), red and green. *Lascelles and Co.*

135 **Stoneware** (two keystones) made in salt glazed stoneware. *Stiff and Sons.*

136 **Fire Clay** (glazed), several specimens of glazed fire clay, kerbs, mouldings, and cornices. *Doulton and Co.*

137 **Bracket and Cornice** in Glazed Terra Cotta. *Cliff and Sons.*

138 **Iron Wall Ties,** for bonding hollow walls (six specimens). *Chambers and Co.*

139 **Sand, Lime and Cement** (in glass case). Various specimens used in the preparation of concrete, mortar, cement and plaster, including sand, ballast, coke breeze, gravel, Portland cement, limes, mortar, concrete, hair, Parian cement, plaster of Paris. *Broad and Co.*

140 **Building Bricks** (specimens of), Pressed Brick unglazed, ditto glazed, Red Facing, Red Pavior, Red Berkshire Kiln-burnt, Red Rubber Berkshire ditto, Blue Pressed Staffordshire, Fire Brick Stourbridge, White Facing Suffolk, Malm Facing Bucks (clamp burnt), Picked Cowley Stock (clamp burnt), Gault Pavior, Brimstone Pavior (Suffolk-kiln), Building Pavior (clamp burnt), Rock Huff Facing Flintshire, Washed Stock, Grey ditto, Rough ditto, Place, Grizzles. *Broad and Co.*

141 **Stoneware Bricks.** *Stiff and Sons.*

142 **Glazed Stoneware Bricks.** *Candy and Co.*

143 **Terra Cotta Bricks.** *Candy and Co.*

144 **Hollow Wall Tie Bricks.** *Geo. Jennings.*

145 **Paving Bricks,** Blue Stable Pavior 8 panels, ditto 2 panels, ditto diamonds, Adamantine clinker, Lincolnshire. *Broad and Co.*

146 **Silicon Treads** (two specimens) round and square nosing. *Doulton and Co.*

147 **Air Bricks** (several specimens) in various materials, and in a variety of sizes, including stoneware, terra cotta and fire clay.

148 **Marbles** (four specimens) of Irish marbles (in frame in front of platform). *R. Colles.*

149 **Non-Conducting Slag Felt** (in glass case on table in centre of hall) for insulating fire and sound proofing, and for proof against vermin *C. Baatsch.*

150 **Japanese Appliances and Materials,** including specimens of bricks, roofing tiles, channel pipes, shingle for roofing purposes, soaps, paper and several models of walls for interior and exterior. Models of folding screens, water pipes, brushes, urinary tub and domestic utensils. *The International Health Exhibition Committee.*

151 **Hearth Tiles.** Specimens of tiles laid for hearths. *Webb and Co.*

152 **Hearth Tiles and Fender Kerbs.** Fixed in fire place on platform. *Doulton and Co.*

Damp-Proof Courses.

170 **Concrete Slab and Cappings.** *The Eureka Concrete Company.*

171 **Damp-proof Course,** glazed stoneware. *Doulton and Co.*

172 **Damp-proof Course,** glazed stoneware. *Stiff and Sons.*

173 **Impervine Slab** for damp-proof course. *J. C. Bloomfield.*

174 **Concrete Slab** with polished Mosaic surface. *C. Drake and Co., Ltd.*

175 **Asphalte Roof** (model) laid $\frac{3}{4}$in thick in two layers of $\frac{3}{8}$ inch each, with flashing to brick-work and angle fillets. *Val de Travers Asphalte Paving Company, Limited.*

176 **Asphalte Floor** for basement (model), including damp course in wall, and vertical covering to outside face of same, to withstand pressure of water in wet situations. *Val de Travers Asphalte Paving Company, Limited.*

177 **Roofing Slates** often used as a damp-proof course.

178 **Willesden Paper** for under-lining damp walls. *Willesden Paper Co.*

179 **Hygeian Rock Composition** (model) showing method of application and illustrating the damp-resisting qualities. *W. White.*

180 **Damp Proof Courses.** Four models, built with bricks (one-eighth ordinary size), upon an artificially damped foundation.

A. represents a 9-inch wall with quoin (English Bond), mortar joints, and a damp proof course, consisting of two rows of slate bedded with cement.

B. represents a 9-inch wall (Flemish Bond) with mortar joints. There is no damp proof course in this model, and, consequently, the effects of damp can be traced through the whole of the brickwork.

C. represents a 9-inch wall with glazed stoneware damp proof course.

D. represents a 13½-inch wall with air space, built to illustrate the requirements of the Model Bye Laws, where rooms are built for occupation below the ground level. The damp proof course in this model consists of asphalte laid above the ground line in outer portion of wall and below the floor line in inner portion.

Paints and other Protectives.

190 **Barff Process.** Specimen of iron treated by the Barff process, a process in which the iron is subjected to super-heated steam and coated with black magnetic oxide, which is indestructible by atmospheric influences.

191 **Galvanized Iron.** Specimen of iron coated with zinc, by the process known as galvanizing.

192 **Angus Smith's Solution.** Specimen of iron treated with this solution. The solution is a coal tar preparation, and applied whilst the iron is at a high temperature.

193 **Burnettized Wood.** Specimens treated by this process to preserve it from the effects of dampness and atmospheric changes. *Sir Wm. Burnett and Co., Limited.*

194 **Duresco and Charlton White.** The ceiling in central hall of Museum is decorated with these materials. *J. B. Orr and Co.*

195 **Non-Arsenical Colours** (in glass case). Specimens of colours used by Messrs. Woollams and Co. in decorating their wall papers, and suitable for decorative purposes in distemper. *William Woollams and Co.*

196 **Antioxide.** Piece of iron, one side originally polished, half of which was painted with antioxide and then exposed to sulphuric acid gas. *Peters, Bartsch and Co.*

197 **Carbolineum,** Two pieces of wood prepared with carbolineum and placed in the ground for three years ; also piece of wood not treated and put in the ground at the same time ; about 12 inches of a stake removed from the ground after 15 years' exposure ; one paring block, immersed for ten minutes, showing penetration ; and other specimens. *Peters, Bartsch and Co.*

Wall Papers and Coverings.

210 **Wall Paper** (twelve specimens) framed and hung on south wall of Museum, showing designs and qualities of Woollam's non-arsenical wall papers. *Wm. Woollams and Co.*

211 **Wall Paper** (dados, fillings, and friezes), affixed to wall at the end of Museum behind the platform, illustrating pattern and general effect of Woollam's non-arsenical wall papers. *Wm. Woollams and Co.*

212 **Wall Paper** (Pattern Book) of specimens of washable papers. *Jeffrey and Co.*

213 **Wall Paper**—non-arsenical (specimens). *Jabez Hogg*, F.R.C.S.

214 **Wall Paper, Washable** (patterns). Designed to be washable, waterproof and non-poisonous. *Fisher and Co.*

215 **Japanese Leather Hangings** (several specimens). A washable and decorative material. *Maguire and Son.*

216 **"Willesden" Paper** (specimens in frames), for underlining damp walls, etc. *Willesden Paper Co.*

217 **Wall Papers,** in frames on wall near staircase. Illustrating speciality of design. *D'Oyly and Co.*

218 **Lincrusta Walton** (specimens fixed on wall) near entrance to Museum. This material is made in neutral tints, and treated decoratively with ordinary paint. *Lincrusta Walton Co.*

219 **Anaglypta** (specimens on wall, ceiling and in panels). The decorative treatment of this material is effected with ordinary paint. *Anaglypta Co.*

Duresco and Charlton White. See Paints and Protectives.

221 **Plaster Slabs** (Hitchen's). Several specimens of ceiling slabs, pilasters and arches. Fire-resisting and decorative. *R. W. Hitchens.*

222 **Wall Tiles,** for exterior. Several specimens in frame near staircase. *Thos. Lawrence and Son.*

223 **Hanging Wall Tiles** (Hall's.) Several specimens, showing colours and method of fixing. *Cliff and Sons.*

224 **Wood Panels.** Several specimens of mouldings and panelling fixed on platform, also two panels in walnut and pine. *J. F. and G. Harris and Co.*

Wall Tiles (several specimens in frames on wall) sent by various makers, including Minton's, Doulton's, Jos. Cliff and Son's, and Burmantoft's. See Decorative Materials.

Flooring.

230 **Fire Proof Flooring** (Doulton Peto), showing skew-block with girder protection, key of arch and key for plaster. *Doulton and Co.*

231 **Fire Proof Flooring** (specimen), showing girder protection and key for plaster. *Homan and Rodgers.*

232 **Hollow Flooring** (specimen), damp and fire-proof, and convenient for ventilation or warming. *G. E. Pritchett*, F.S.A.

233 **Concrete Slabs,** for Flooring. *Eureka Concrete Co.*

234 **Wood Block Flooring,** Immovable Acme (Duffy's). A small specimen, showing method of joining; and also a portion of the floor of hall (near the entrance) covered with this flooring laid by the patentees in 1885. *Duffy and Co.*

235 **Parquet Flooring.** Specimen.

236 **Paraffined Flooring.** Specimens showing details of construction, and a portion laid in floor of hall. This flooring is specially prepared with paraffin and fixed without showing nail holes. As laid in the Bristol General Hospital under the supervision of the late W. Eassie, C.E. *Thos. Jennings.*

237 **Paraffined Flooring.** Specimen of flooring taken from a bay window after ten years' exposure. *Chas. Langstaff*, M.D.

238 **Paraffined Flooring** (Model of Floor) laid diagonally with bevel edged boards and treated with paraffin. *Chas. Langstaff*, M.D.

239 **Parquet Flooring** (specimen in teak) as laid in Westminster Hospital. *Howard and Sons.*

240 **Wood Blocks for Flooring,** showing staining penetrated through the whole thickness of the wood; designed to maintain the pattern as the surface becomes worn down by traffic. *Webb's Worcester Tileries Co.*

241 **Wood Block Flooring** (Disc Key). Specimens laid in floor of hall. *Westminster Patent Flooring Co.*

242 **Parquet Flooring.** Specimen laid on Library floor. *Howard and Sons.*

243 **Mosaic Flooring.** Specimen laid in Library hearth. *Diespeker and Co.*

244 **Mosaic Flooring.** Specimen of marble mosaic, laid in floor of Museum. *Mainzer and Kempthorne.*

245 **Linoleum.** Portions laid on stone floor of corridor and wood floor of gallery. *The Addlestone Linoleum Co.*

246 **Wood Flooring.** Fixed on platform, illustrating various styles. *J. F. and G. Harris and Co.*

Decorative Materials.

250 **Wortley Faience.** Specimen of dados, panels, cornices, friezes, hearth and floor tiles. *Cliff and Sons.*

251 **Tiles.** Specimens of hand-painted tiles and panels and Doulton ware, filters and vases. *Doulton and Co.*

252 **Tiles.** Specimens of hand-painted and embossed tiles for walls, &c. *Minton, Hollens and Co.*

253 **Faience Panel and Wall Tiles.** Three panels on wall of Museum, decoratively treated with "Burmantoft's" glazed tiles and faience panel. *The "Burmantofts" Co., Limited.*

254 **Stoneware Panel.** *Stiff and Sons.*

255 **Red Concrete Panel.** *W. H. Lascelles and Co.*

256 **Pilaster Ceilings and Arches** in Hitchen's patent fire-resisting plaster slabs. Fixed under gallery and at end of hall. *R. W. Hitchens.*

257 **Red Concrete.** Head of Minerva on bracket in Library. *W. H. Lascelles and Co.*

258 **Mosaic.** Head of Moses. (Near platform.)

259 **Vases and Plaques.** Specimens of Faïence and Doulton ware vases and plaques *Doulton and Co.*

CLASS II.—WATER SUPPLY & SEWERAGE.

THE CLASS IS ARRANGED UNDER THE FOLLOWING SUB-HEADS:-

Apparatus for Water Supply.
Filtering & Softening of Water.
Water Waste Preventers.
Flushing and Watering.
Sinks.
Baths and Lavatories.
Water Closets.
Urinals.
Sewers, Drain-pipes and Accessories.
Traps and Gullies.
Dry Closets.
Sewage Treatment.
Miscellaneous Sanitary Goods.

Apparatus for Water Supply.

280 **Wooden Pipes** (two specimens). Pipes used for water mains. *West Middlesex Water Works Co.*

281 **Water Fittings,** including (A) meter, (B) stop valve, (C) lavatory valves, (D) self-closing valves, (E) regulating stop valve, (F) bib valves, (G) reverse ball valve in automatic tank, and (H) pressure gauge. *Tylor and Sons.*

282 **Water Meter** (Ahrbecker's). The water is made to pass through oblique apertures in a fixed plate into oblique or spiral passages in a rotating cylinder, the axle of which turns the index of a dial. *H. C Ahrbecker and Son.*

283 **Hydraulic Ram.** *C. L. Hett.*

284 **Tin-lined Lead Pipes** (in glass case), for water, beer, mineral waters, etc.; designed to prevent lead poisoning. *Messrs. Quirk, Barton and Co.*

285 **Glass-lined Iron Pipe** (two specimens), showing bend and method of jointing. *Cooper and Co.*

286 **Valves** (Trott's). Several specimens of valves, including ball, stop, bib and lavatory valves, illustrating the adaptation of the patent to each form. One of these valves will be found fixed in corridor near entrance to Museum. These valves are provided with an arrangement by which the seating can be removed for repairs without cutting off the water supply. *H. Trott.*

287 **Self-closing Valve** (Jenning's), designed to prevent waste of water by carelessness or neglect. *Geo. Jennings.*

288 **Solderless Jointing for Lead Pipes** (Law's), showing stop-cock and unions. *Hy. Law,* M.INST.C.E.

289 **Stop-Cock.** Quick turn, with grooved joints for fixing to lead without solder, and designed to stand high pressure. *Tylor and Sons.*

290 **Rat-gnawed Pipes.** Several specimens of pipes showing the indented marks of teeth, clearly tracing the damage done by rats. *Rogers Field,* M.INST.C.E.

291 **Corroded Pipes.** Two sections of wrought iron pipes lined with deposit, taken from the Great Northern Hotel. *H. Harland.*

292 **Fountain** (terra-cotta), fixed in corridor. *Doulton and Co.*

293 **Ball, Valve,** with glass float. *G. F. L. Meakins.*

294 **Iron Pipe.** Specimen taken up after being embedded in cement for nine years, showing how the cement had eaten through the enamel in several places and also through the pipe. *Dr. Graham.*

295 **Root,** found growing in an underground drinking water tank at Campden Hill, W. *Ernest Turner,* F.R.I.B.A.

296 **Abyssinian Well Driving Apparatus** (Norton's), showing pioneer tube, driving weight or monkey, tripod and pulleys. *Legrand and Sutcliff.*

297 **Force Pump** for testing purposes. *Tangyes.*

298 **Rain Water Separator** (Roberts'), designed to allow the washings of the roof at the commencement of rain to pass away to drain, and to store only clean potable water. *C. G. Roberts.*

299 **Lead Lined Tank,** (about 250 gallons) with 1-inch ball valve, used for storage of water for Museum.

300 **Indestructible Combination Washers,** for flange joints. *Peters, Bartsch and Co.*

Flushing and Watering.

320 **Automatic Siphon Flush Tank** (Field's) with glass front, showing the construction and action. This tank is fitted to and flushes a two-seat trough closet. *Bowes Scott and Western.*

321 **Automatic Siphon Flush Tank** (Doulton's), used for flushing urinals. *Doulton and Co.*

322 **Automatic Siphon Flush Tank** (Doulton's). About 10 gallons *Doulton & Co.*

323 **Automatic Siphon Flush Tank** (Emanuel's), with glass front and reverse ball-cock action. On the lever being raised the valve is opened, and where a good pressure of water is obtainable the rush of water at the last stage of filling is sufficient to start the Siphon which discharges the contents of tank. *Emanuel & Son.*

324 **Automatic Flush Tank** (Maguire's). Mechanical in action, for flushing house drains, trough closets and urinals. *Maguire and Sons.*

325 **Stoneware Automatic Siphon Flush Tank** (Field's). Fixed in position, showing sink and other wastes entering over grating and discharging to model cottage garden by sub-soil drains. *Rogers Field,* M.INST.C.E.

326 **Flush Tank.** Working model in glass of (Field's). Automatic siphon flush tank. *Rogers Field,* M.INST.C.E.

327 **Flush Pot** (Col. Waring's). For fixing beneath scullery sinks, designed to intercept fat, and facilitate the periodic flushing of scullery drains. *Tylor and Sons*

328 **Flushing Cistern** with glass front, and ordinary spindle valve connected to lever with wire.

329 **Flushing Cistern,** siphon. *The Falcon Brass Works Co.*

330 **Flushing Cistern,** siphon. *Winser and Co.*

331 **Flushing Cistern,** tranquil siphon (Bolding's). Connected to closet and arranged with seat action. *J. Bolding and Sons.*

332 **Flushing Cistern,** siphon, The "Tower" (Tylor's). *Tylor and Sons.*

333 **Flushing Cistern,** siphon (Jenning's). Connected to closet and arranged with seat action. *Geo. Jennings.*

334 **Flushing Cistern,** siphon (Braithwaite's). The siphon is made to discharge the contents over the side instead of through the bottom, as in most other cisterns. *H. Braithwaite and Co.*

335 **Flushing Cistern,** the "Vacuum" (Doulton's). *Doulton and Co.*

336 **Flushing Cistern,** siphon, "The Peckham" (Syer's). This flushing cistern is started into action by pneumatic push instead of the ordinary chain pull and lever. *M. Syer.*

337 **Flushing Cistern,** Silent, siphon (Bostel's). Fitted with glass front to show the action. *D. T. Bostel.*

338 **Flushing Cistern,** siphon, the "Newman" (Scott Monerieff's) *North British Plumbing Co.*

339 **Flushing Cistern,** fixed in W.C. (Bean's).

Sinks.

350 **Cecil Slop Sink** (Cliffs'), with flushing rim, for hospitals, housemaids' closets, &c. *Cliff and Son.*

351 **Housemaid's Sink,** enamelled slate, square earthenware basin with flushing rim, water supply and brass rest for pails. *George Jennings.*

352 **Scullery Sink.** Glazed earthenware, fitted to model wall, with cold water supply and trapped waste. *Smith and Co.*

353 **Lead Lined Sink,** fitted with cold water supply and Waring's flush pot beneath. *Tylor and Sons.*

354 **Slop Sink.** Porcelain glazed, "The Imperial." *Cliff and Son.*

355 **Butler's Pantry, Sink.** Porcelain glazed. *Cliff and Son.*

356 **Scullery Sink.** Cement. *The Eureka Concrete Company.*

357 **Scullery Sink.** Glazed earthenware. *Stiff and Son.*

Baths and Lavatories.

370 **Fireclay Bath,** glazed inside and outside, with beaded edge, designed to stand without enclosure, fitted with plug waste. *Jos. Cliff and Sons.*

371 **Lavatory Angle,** earthenware top, basin and top combined, with soap trays draining into basin, fitted for cold water with cam action valve, and lift-up waste. *J. Tylor and Sons.*

372 **Lavatory** (section), showing moveable grid to overflow, and overflow connected to trap to enable the cleaning of pipe and trap, also brass trap with inspection cap and vulcanite plug to basin. *Burn and Baillie.*

373 **Lavatory** (fixed in secretary's office), with marble top, porcelain basin with flushing rim, screw-down cold water valve and lift-up waste. *J. Tylor and Sons.*

374 **Bath Waste,** with 4-inch gird, enabiing the bath to be rapidly emptied, and making the discharge a valuable flushing agent for the drains. *Burn and Baillie.*

375 **Lavatory Basin,** with accessible standing waste and overflow. *Tylor and Sons.*

Water Closets.

380 **Long Hopper.** Specimen of old pattern deep hopper water closet (fitted with spindle valve flush cistern).*

381 **"Pan Closet,"** with cast iron container copper pan and spreader. *Prof. W. H. Corfield.*

382 **Short Hopper,** 40a, with S trap (fitted with siphon flushing cistern).* *Sharp and Co.*

383 **"The Dececo."** The special distinction of this closet is in the siphon form of the outlet, which is designed to exhaust the contents of the basin (fitted with special flushing cistern).* *Winser and Co.*

384 **"The Trone"** Pedestal, fitted with seat action. This closet is of the hopper type. The basin and trap is made in one piece of earthenware, and designed to stand without wooden fixtures (fitted with Bolding's Tranquil flushing cistern).* *J. Bolding and Son.*

* For particulars of Flushing Cisterns see FLUSHING AND WATERING.

385 **"The Compound"** Pedestal Hopper, designed to stand without riser (fitted with Tylor's Tower flushing cistern).* *Tylor and Sons.*

386 **"The Pedestal"** Wash-out. This closet is fixed with a self-raising seat and automatic action for flushing, and stands without wooden enclosure (fitted with Jenning's flushing cisterns).* *George Jennings.*

387 **"The Ariston"** Hopper Water Closet and Slop Sink, with earthenware trap and flushing rim, and provided with wooden seat for use as an ordinary water closet (fitted with Braithwaite's siphon flushing cistern).* *Tylor and Sons.*

388 **"The Excelsior,"** Wash-out (fitted with Bostel's Silent flushing cistern).* *D. T. Bostel.*

389 **Plug Valve,** (Jenning's), with basin and trap in one piece, and fitted with Jenning's regulating water supply valve. *George Jennings.*

390 **Pedestal Hopper Closet,** made in fire-clay, and glazed basin and trap in one piece. *Dent and Hellyer.*

391 **Water Closet,** pedestal Hopper, with lead trap. *J. Bolding and Sons.*

392 **"Table Top" Closet,** of the Hopper type, combined water closet and slop sink. *Dent and Hellyer.*

393 **Valve Water Closet,** with water regulating valve, weir overflow on one side, discharging into lead safe. *Tylor and Sons.*

394 **"The Optimus,"** Pedestal Valve, with earthenware valve box, pneumatic water regulator and special flushed and ventilated overflow. This closet is self-contained and requires no wooden fixtures. *Dent and Hellyer.*

395 **"The Simplex" Valve Closet,** with cast lead valve box, pneumatic regulating valve and special water supply to trap of overflow. *J. Bolding and Sons.*

396 **Trough Closet** (fitted with Field's automatic flush tank). By increasing the size of the flush tank these closets may be used in ranges. They are convenient for use in schools, factories, and similar institutions. *Bowes Scott and Western.*

397 **Old cast-iron Hopper Water Closet,** with lip-trap cast in it. Removed from a house in Mayfair Market. It was served by a ½-inch service direct from the main into the left-hand notch at the top of basin; a 1½-inch lead rain-water pipe from roof of closet discharged into the right-hand notch. The basin was fixed over a brick cesspool 8 feet deep. *Prof. W. H. Corfield.*

398 **"The Household,"** Hopper type (in use in W.C. at the end of corridor) fitted with Bean's flushing cistern. The floor and wall of closet are tiled. The closet is fixed without riser, and every part is open to inspection. This closet, fixed in 1883, was probably the first in England arranged in this way.

399 **Connections, India Rubber** (Twyford's), for making joint between the flushing pipe and the arm of closet basin. *T. Twyford.*

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* For particulars of Flushing Cisterns see FLUSHING AND WATERING.

Urinals.

420 **Self Flushing Urinal** (Wright's). This urinal is fixed in W.C. at end of corridor, in working order, and all pipes and siphons are fitted to enable the details to be clearly seen. *A. White and Sons.*

421 **Urinal Basin,** angular, cast-iron. *A. Kenrick and Sons.*

NOTE.—Several water closets, which are designed to combine the convenience of a urinal, may be seen in the corridor, and descriptions of these will be found under Water Closets. Described as Pedestal, Compound, Combination, &c.

Sewers, Drain Pipes, and Accessories.

430 **Egg-shaped Sewer** (model) built up with earthenware sections.

431 **Egg-shaped Drain Pipe.** Glazed earthenware. *Cliff and Sons.*

432 **Stoneware Drain Pipe** (Doulton's), 12-inch, tested. *Doulton and Co.*

433 **Invert Block** for bottom of brick sewer. *Stiff and Sons.*

434 **Enamelled Iron Sewer,** with subsoil drain (model) (Hawkins'). *I. T. Hawkins.*

435 **Junction Block,** stoneware, for connecting 4-inch pipe drain with brick sewer. *Smith and Co.*

436 **Inspection** or **Lamphole Block,** stoneware, for fixing in the top of large brick sewers. *Smith and Co.*

437 **Drain Pipes** (Doulton's), 3, 4 and 9-inch best London, tested, glazed earthenware, drain pipes with ordinary spigot and socket ends. *Doulton and Co.*

438 **Drain Pipe** (Doulton's). Vitrified glazed, 6-inch. *Doulton and Co.*

439 **Drain Pipe with Stanford Improved Joints** (Doulton's), self-adjusting and self-jointing 6-inch pipes. A bituminous composition is moulded to both ends of the pipe, which is designed to form a perfectly water-tight but not a rigid joint. *Doulton and Co.*

440 **Stoneware Drain Pipe** (Jenning's), 6-inch, with butt ends for use with patent sockets. *Geo. Jennings.*

441 **Stoneware Drain Pipe,** 9-inch. *Cliff and Sons.*

442 **Drain Pipes,** with double seal joint (Tyndale's patent), 6-inch. *Cliff and Sons.*

443 **Taper Pipe.** Glazed stoneware for increasing diameter of drain from 4 inches to 6-inches. *Cliff and Sons.*

444 **Drain Pipe Joint** (model) (Stanford's). Self-jointing, with square junction and stoppers. *Doulton and Co.*

445 **Drain Pipe Joint** (models) (Mawbey's). This pipe is made with divided sockets, and has studs in the lower half of the sockets, to ensure a true bore. *T. Wragg and Sons.*

446 **Drain Pipe Joint** (Jennings'). Two halves of socket. A specimen of the pipe which butts into this socket will be found with Drain Pipes No. 440. *George Jennings.*

447 **Drain Pipe Joint** (Archer's), showing cement and clay keyed joint; also holes for pouring in liquid Portland cement. *The Archer Pipe Co.*

448 **Drain Pipe Joints** (Maguire's). Specimen of chair or rest for stoneware pipe joint. For method of fixing, see Model No. 449. *Maguire and Sons.*

449 **Drain Pipe Joints** (model) (Maguire's), showing method of jointing Maguire's patent pipes with stoneware chairs or rests. *Maguire and Sons.*

450 **Rough Bends.** Two specimens, one new from the works and the other as removed from a drain with the way blocked.

460 **Knuckle Bend,** stoneware, 4-inch. *Doulton and Co.*

461 **Knuckle Bend,** stoneware, 4-inch. *Cliff and Sons.*

462 **Bends,** stoneware, 4-inch, easy. Two specimens with differing radius. *Doulton and Co.*

463 **Bends,** stoneware, 4-inch, sharp. Two specimens with differing radius. *Cliff and Sons.*

464 **Bend,** stoneware, 4-inch, sharp, with inspection socket. *Cliff and Sons.*

465 **Junction Pipe,** stoneware (V shape), 4-inch on 4-inch. *Doulton and Co.*

466 **Junction Pipe,** stoneware (V shape, with inspection socket), 4-inch. *Doulton and Co.*

467 **Junction Pipe,** stoneware (Y shape), 4-inch on 4-inch. *Doulton and Co.*

468 **Junction Pipe,** stoneware (double Y shape), 4-inch on 4-inch. *Doulton and Co.*

469 **Junction Pipe,** stoneware (Y shape), 4-inch on 6-inch. *Cliff and Sons.*

470 **Junction Pipe,** stoneware (double Y shape), 4-inch on 6-inch. *Cliff and Sons.*

471 **Junction Pipe,** stoneware (double Y shape, with inspection), 4-inch on 6-inch. *Cliff and Sons.*

472 **Junction Pipe** (model), iron, with air-tight inspection cover (Scott Moncrieff's). *North British Plumbing Co.*

473 **Set-off Pipe,** stoneware, 4-inch. *Doulton and Co.*

474 **Flap Valve,** 4 inch, used in drains for preventing backflow either from overcharged drains and sewers or from tidal flow. *Smith and Co.*

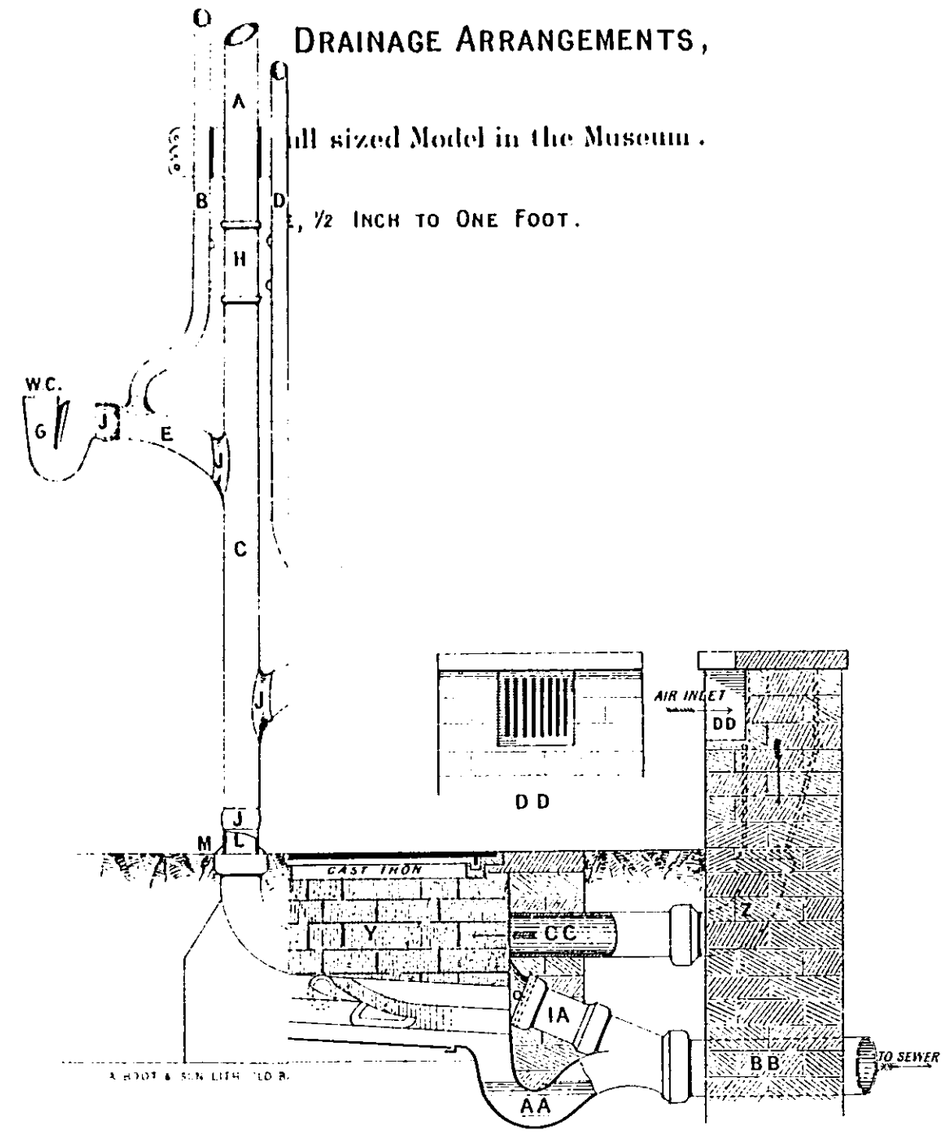
475 **Flap Valve** (Baldwin Latham's design), with balanced weight, 4-inch, used in drains for preventing backflow either from overcharged drains and sewers or from tidal flow. *Doulton and Co.*

476 **Rain Water Shoe** (Hellyer's), to receive the discharge of rain water pipes and surface drainage. This shoe does not act as a trap. *Doulton and Co.*

DRAINAGE ARRANGEMENTS,

ll sized Model in the Museum.

, ½ INCH TO ONE FOOT.



A Ventilating Shaft.
B 2in. Air Pipe (Anti-Sipho
C 4in. Drawn Lead Soil Pi
D 2in. Air Pipe (Anti-Sipho
E 4in. Lead Branches for C
F Earthenware Closet Trap.
G Anti D Trap.
H Astragal Joint.

atory Waste.
Water Pipe and
above.

X Trapped Gully.
Y Disconnecting Chamber lined with White Glazed Bricks with Benchings rendered in Cement and with Glazed Channels.
Z 4in. Easy Bend.
AA Intercepting Trap with Inspection Arm—IA
BB 6in. Drain Pipe to Sewer.
CC 4in. Ventilating Pipe connecting with Air Inlet—DD
DD Front View of Air Inlet shewing 9in. grating.

oint (Archer's), showing cement and clay keyed holes for pouring in liquid Portland cement. *The Co.*

Joints (Maguire's). Specimen of chair or rest pipe joint. For method of fixing, see Model No. 449. *Sons.*

Joints (model) (Maguire's), showing method of uire's patent pipes with stoneware chairs or rests. *Sons.*

. Two specimens, one new from the works and the oved from a drain with the way blocked.

, stoneware, 4-inch. *Doulton and Co.*

, stoneware, 4-inch. *Cliff and Sons.*

are, 4-inch, easy. Two specimens with differing radius. *Co.*

are, 4-inch, sharp. Two specimens with differing radius. *ns.*

re, 4-inch, sharp, with inspection socket. *Cliff and Sons.*

e, stoneware (V shape), 4-inch on 4-inch. *Doulton*

e, stoneware (V shape, with inspection socket), 4-inch. *Co.*

e, stoneware (Y shape), 4-inch on 4-inch. *Doulton*

e, stoneware (double Y shape), 4-inch on 4-inch. *Co.*

, stoneware (Y shape), 4-inch on 6-inch. *Cliff and Sons.*

e, stoneware (double Y shape), 4-inch on 6-inch. *ns.*

e, stoneware (double Y shape, with inspection), nch. *Cliff and Sons.*

(model), iron, with air-tight inspection cover (Scott *North British Plumbing Co.*

toneware, 4-inch. *Doulton and Co.*

4 inch, used in drains for preventing backflow either rged drains and sewers or from tidal flow. *Smith and Co.*

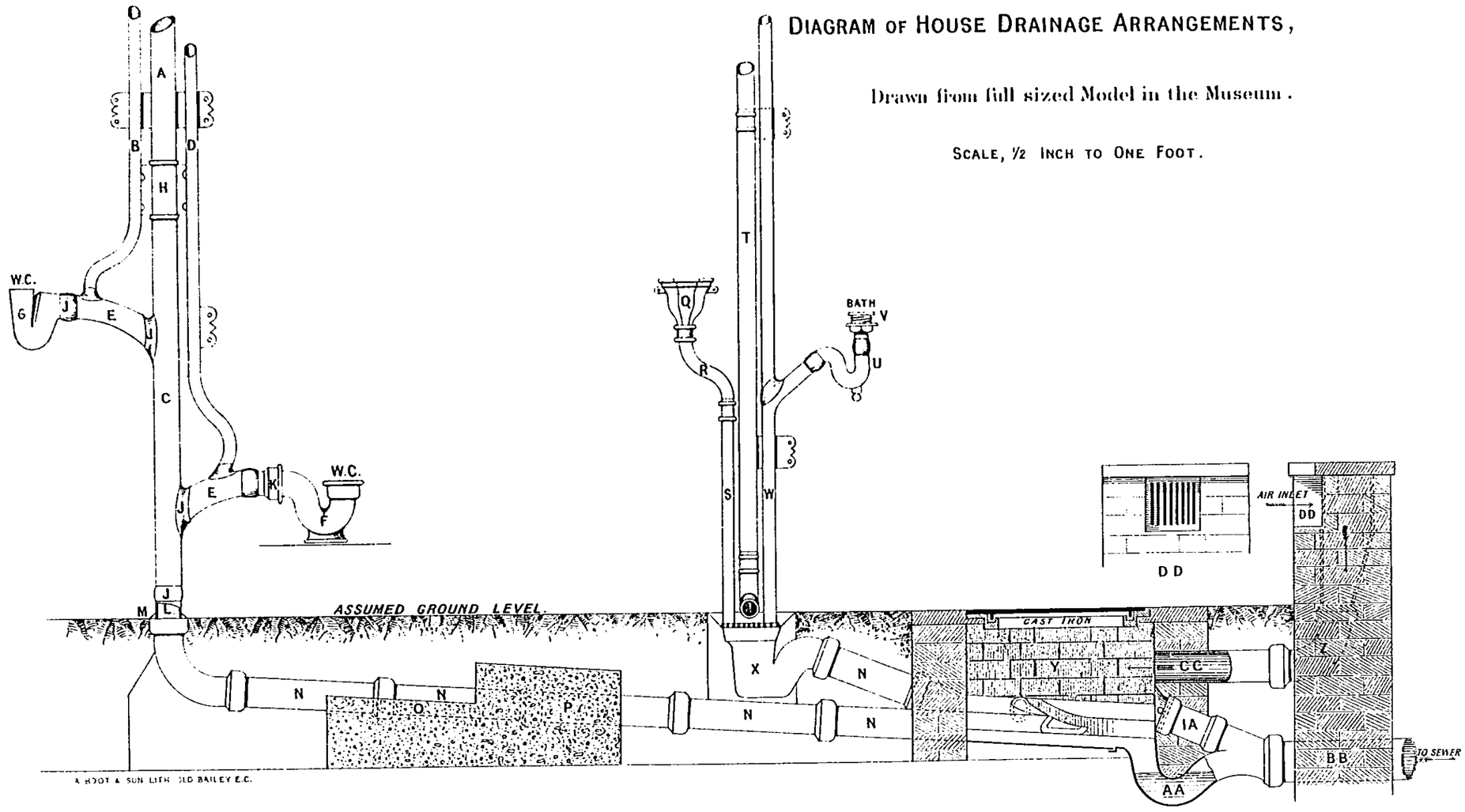
Baldwin Latham's design), with balanced weight, 4-inch, ins for preventing backflow either from overcharged ewers or from tidal flow. *Doulton and Co.*

Shoe (Hellyer's), to receive the discharge of rain water urface drainage. This shoe does not act as a trap. *Co.*

DIAGRAM OF HOUSE DRAINAGE ARRANGEMENTS,

Drawn from full sized Model in the Museum.

SCALE, ½ INCH TO ONE FOOT.



A Ventilating Shaft.
B 2in. Air Pipe (Anti-Siphonage).
C 4in. Drawn Lead Soil Pipe, 10lb. lead.
D 2in. Air Pipe (Anti-Siphonage).
E 4in. Lead Branches for Closets.
F Eartheware Closet Trap.
G Anti D Trap.
H Astragal Joint.

J Wiped Solder Joints.
K Brass Ferrule for jointing Earthenware Trap to Lead.
L Brass or Copper Thimble for connecting Stoneware Bend to Lead Soil Pipe.
M Cement Joint (in Section).
N 4in. Drain Pipes jointed with Cement.
O Two Feet of Pipe bedded on 6in. Concrete.
P Two Feet of Pipe bedded in 6in. Concrete.

Q Hopper Head (Galvanized Iron) for Lavatory Waste.
R 6in. Set-off do. do.
S 3ft. Length do. do.
T 6ft. Length 3in. do. Rain Water Pipe and Shoe
U Lead P Trap with Cleaning Screw.
V Plug Waste for Bath.
W Bath Waste Pipe with Ventilating Pipe above.

X Trapped Gully.
Y Disconnecting Chamber lined with White Glazed Bricks with Benchings rendered in Cement and with Glazed Channels.
Z 4in. Easy Bend.
AA Intercepting Trap with Inspection Arm—I A
BB 6in. Drain Pipe to Sewer.
CC 4in. Ventilating Pipe connecting with Air Inlet—DD
DD Front View of Air Inlet shewing 9in. grating.

477 **Channels and Bends,** glazed stoneware. Several specimens (showing various angles and shapes) for use in Inspection chambers. *Doulton and Co.*

478 **Channels and Bends,** glazed stoneware (showing various angles and shapes), for use in Inspection chambers. *Broad and Co.*

479 **Channels and Bends,** glazed stoneware (Winser's), for use in Inspection chambers. *Cliff and Sons.*

480 **Channel,** taper, 6-inch to 4-inch, glazed. *Broad and Co.*

490 **House Drainage** (full-sized model), showing a ventilated soil pipe made in 10lb lead, with astragal and wiped joints and two closet branches, one of which is connected to a lead trap, and the other to a stoneware trap, and both provided with 2-inch anti-syphonage pipes. The soil pipe is connected to a 4-inch stoneware pipe drain. The method of making this important joint is shown in section, the joint is illustrated as being above the ground level, and thus open to inspection. The drain is made with 4-inch tested pipes, with ordinary cemented spigot and socket joints, one portion being bedded *on* concrete, and another portion embedded *in* concrete. The drain (10-feet in length) is laid with a fall of 7 inches, and terminates in an Inspection Chamber constructed with cement floor, glazed channels, glazed brick lining, and covered with (model) air-tight cover. Representations are also given of a 3-inch rain water pipe (in galvanized iron), a 2-inch ventilated bath waste (in lead) with lead trap and bath plug and union, and a 2-inch lavatory waste with hopper head (in galvanized iron). These are collected and discharged into an ordinary glazed stoneware gully with outlet, connected by 4-inch drain to the Inspection Chamber.

The Inspection Chamber is provided with fresh air by means of a flue constructed in 4-inch earthenware pipes, carried below the ground level to a wall near, and terminated with a 9-inch by 9-inch grating. An intercepting trap is fixed at this point with well of trap inside the Inspection Chamber, and provided with an inspection arm for access to the 6-inch drain beyond trap to sewer. This arm is securely stopped with a Stanford jointed stopper, and the trap is so fixed as to be seen in section, from the channel of Inspection Chamber to the connection with the 6-inch drain. This mode occupies about 18-feet on the north side of Museum, and is open to inspection in all its details. A diagram, with full particulars, is placed near the exhibit, and a copy of the same will be found in this catalogue.

491 **Drainage of Museum** (plan) (*near entrance to Museum*), showing the old arrangement of drainage of The Parkes Museum, in direct communication with the sewer. *Rogers Field*, M.INST.C.E.

492 **Drainage of Museum** (plan) (*near entrance to Museum*, showing the new arrangement of drainage of The Parke Museum, as planned by Mr. Rogers Field, M.INST.C.E., and Prof. W. H. Corfield, M.A., M D. *Rogers Field*, M.INST C.E.

493 **Drainage of Museum.** The whole of the sanitary fittings, and the drainage of The Parkes Museum, as illustrated in the plans just mentioned, including lavatory, water closet, urinal, sinks, and rain-water service have been carried out, with a view to make the same both interesting and instructive, and is open for inspection in all its details.

494 **Inspection Chamber** (full sized model), fixed in floor of corridor, fitted with glazed brick sides to channel, glazed channels, intercepting trap, and airtight cover. *Messrs. Broad and Co.*

495 **Air Inlet,** for fixing on a circular pipe, with mica flap to prevent a back draught. *Hayward Bros. and Eckstein.*

496 **Perforated Pipes** (4 and 6-inch), used for subsoil drainage and irrigation purposes. *J. H. Catlen.*

497 **Two Asphalte Drain Pipes** found in the course of a house drain, the upper part of each of these pipes has been softened by the warm air in the drain and has bulged downwards from the weight of earth upon it. The only specimen known. *Prof. W. H. Corfield.*

498 **Roots of Tree** (specimen), taken from a 9-inch drain, having evidently found their way through a faulty joint. *Ernest Turner,* F.R.I.B.A.

510 **Soil Pipe,** galvanized. Specimen of 6 ft. length, 4-inch.

oil Pipe, 6 ft. length, 4-inch, treated with the Barff process to prevent oxidation.

512 **Soil Pipe** (two specimens), coated inside and out with Angus Smith's solution ; 4-inch. *Macfarlane and Co.*

513 **Soil Pipe Bend** (drawn lead), 4-inch. *Dent and Hellyer.*

514 **Soil Pipe Joint** (Blair's), forming fresh air inlet. *Blair.*

515 **Soil Pipe** Specimen cut from large soil pipe in use for 20 years, running up five stories and taking four closets one above another and continued up above the roof of building by 4-inch ventilating pipe.

516 **Soil Pipe.** Specimens of lead soil pipe with perforations caused by the action of foul air.

517 **Soil Pipe Joint.** Specimen of defective joint repaired with canvas and red lead.

530 **Rainwater Pipe, rectangular,** 4-inch by 3-inch, with Gregson's hanger, fixed in angle. *J. Gregson.*

531 **Rainwater Bend,** with Gregson's hanger. *J. Gregson.*

532 **Hopper Head,** for 3-inch pipe (Gregson's). *J. Gregson.*

533 **Rainwater Pipes and Hangers** (Gregson's). Several specimens fixed on board, showing various forms of hangers, joints and pipes. *J. Gregson.*

534 **Rainwater Pipe** (Macfarlane's), with ties for brick or stone walls. *Macfarlane and Co.*

535 **Rainwater Collar and Flange** (Law's)

536 **Rainwater Pipes.** Two pipes and shoe (3 by 3), specially treated by the Barff process, to prevent oxidation. *Prof. Barff.*

540 **Manhole Cover,** cast-iron (Botting's), square in form. Fitted with an India-rubber washer and two gun-metal fasteners. *F. Botting.*

541 **Manhole Cover,** cast-iron (Angell's), square in form. Fitted with a joint of plastic material and a gun-metal fastener. *A. T. Angell.*

542 **Manhole Cover,** cast-iron (Durrans'), circular in form, with two lugs for opening. The joint is made by the truly turned surfaces. *T. H. Durrans.*

543 **Manhole Cover,** cast-iron (Broad's), oval in form. This cover may be fitted air-tight if required with plastic composition. *Broad and Co.*

544 **Manhole Cover** (Jones'). Two models, rectangular in form, showing the section of cover, which consists of a lower dome-shaped cover (designed to seal itself by collecting the liquids condensed on its under surface) and an upper cover, with tongue and grooved joint, which may be filled with any plastic material. *J. Jones.*

545 **Manholes and Service Reservoirs** (a series of drawings from designs by Sir Robert Rawlinson) in folio **M.** No. 34 in Catalogue.

546 **Inspection Cover,** cast-iron (Botting's), fitted with India-rubber ring and screw action for making the joint air-tight. *F. Botting.*

550 **Joint for Earthenware to Lead** (two specimens and diagram) (Smith's), one showing lead connection on trap, and the other showing lead connection wiped on to soil pipe. *B. C. Smith.*

551 **Joint for Earthenware to Lead** (three specimens) (Harrisson's).
- **A** Specimen of trap and lead branch fixed.
- **B** Specimen showing flange of trap.
- **C** Specimen showing earthenware flange and lead pipe.

T. Harnett Harrisson.

552 **Joint for Earthenware to Lead** (Bean's). This joint is made with an asbestos or india-rubber ring and Portland cement. *Milne, Son and Macfie.*

553 **Joint for Earthenware to Lead** (model of Water Closet), showing method of jointing lead trap to basin of closet. *Tylor and Sons.*

554 **Ferrules** (copper and brass) for jointing lead soil pipe to earthenware pipe. *Milne, Son and Macfie.*

560 **Smoke Machine** (Watt's Asphyxiator) for testing drains or fumigating purposes. *J. Watts and Co.*

561 **Smoke Machine** (Burn and Baillie's Patent) for testing drains or fumigating purposes. *Burn and Baillie.*

562 **Smoke Machine** (Botting's), for testing drains or fumigating purposes *F. Botting.*

563 **Drain Grenades,** filled with peppermint and other pungent ingredients for testing drains, with apparatus for breaking the same beyond the water seal of any trap. *Banner Sanitation Co.*

564 **Smoke Rockets** (Pain's) for testing drains. *Jas. Pain.*

565 **Drain Stoppers** (Burn and Baillie's), with interchangeable rings, used in testing or stopping drains during repairs. *Burn and Baillie.*

566 **Drain Stoppers** (Botting's Patent) (specimens of 4, 6, and 9-inch) used in testing or stopping drains during repairs. *F. Botting.*

567 **Drain Stopper** (Jones'), (specimen of India-rubber Drain Stopper), with air pump for charging same. Used in testing or stopping drains during repairs. *J. Jones.*

568 **Drain Cleaning Apparatus** (Ashford's), including cane rods, flexible ditto, plunger, duplex roller, spiral screw, archimedian screw, drop scraper, Turk's head and spiral brush. *Ashford and Co.*

569 **Drain Cleaning Apparatus,** including a set of rods, screw and spiral brush. *Ben Reed and Sons.*

570 **Drain Brush,** for cleaning drains. *F. Botting.*

Traps and Gullies.

580 **Bell Trap.** Square, cast iron, with moveable grating.

581 **Bell Trap,** old pattern, with hinged grating. *A. H. Stanbury.*

582 **Bell Trap** (Jennings') (two specimens), showing loose grid and inner cone. *Geo. Jennings.*

583 **Bell Trap** (Jennings' Improved). *Geo. Jennings.*

584. **Bell Trap,** old pattern, with loose grid, very much corroded. *Prof. W. H. Corfield.*

585 **Overflow Trap in Closet, Plug Valve.** *Geo. Jennings.*

586 **Ball Trap** (Bower's), (two specimens), for lavatory waste, with floating ball seal. The glass bell and screw cap are for inspection. *J. Smeaton and Son.*

587 **Ball Trap** (Jennings'), for lavatory wastes, with inspection cap. *Geo. Jennings.*

588 **Cast Lead Traps** (Smeaton's), (three specimens), 4-inch trap for closets, marked A inlet, B outlet. Section of ditto, marked A inlet, B outlet. 2-inch ditto for baths or lavatories. *J. Smeaton and Son.*

589 **Anti-D Traps** (Hellyer's), cast lead (four specimens), designed to prevent siphonage; in sizes suitable for W.C., bath and lavatory wastes. *Dent and Hellyer.*

590 **Drawn Lead Traps** (three specimens), with inspection caps for lavatories, baths and sink wastes. A, 2-inch S trap; B, 1½-inch S trap; C, 1½-inch P trap. *Dent and Hellyer.*

591 **Drawn Lead Traps** (Dubois' Pattern), 4-inch, used for water closets, A, S trap; B, P trap. *Dan. Emptage.*

592 **Brass Trap** (Burn and Baillie's), with union, vulcanite plug, and special inlet from overflow, which is fixed with a movable grid, thus giving access for cleaning. (See complete section, No. 372.) *Burn and Baillie.*

600 **Gulley Trap,** 4-inch, with inlet at back and S outlet. *Doulton and Co.*

601 **Gulley Trap** (section). Stokes, with inspection. *Cliff and Son.*

602 **Rainwater Trap** (Hellyer's), with three connections and grid for surface drainage. *Doulton and Co.*

603 **Trap** (section), with an inlet on sewer side for inspection or anti-siphonage pipe. *Stiff and Sons.*

604 **Gulley,** with P outlet, rebated for grating. *Doulton and Co.*

605 **Anti D Trap.** Stoneware, 4-inch (Hellyer's). *Doulton and Co.*

606 **Gulley,** with dished top and rim to prevent splashing. *Doulton and Co.*

607 **Traps for Sinks.** Three specimens (P, S, and S with inspection). 2-inch, vitrified glazed. *Doulton and Co.*

608 **P Trap,** with reversible top. *Doulton and Co.*

609 **Gulley.** Buff glazed, P outlet, without rebate for grid. *Broad and Co.*

610 **P Trap.** 4-inch with connection on sewer side for inspection or ventilation. *Doulton and Co.*

611 **Gulley Top,** with channel (Docking's). Designed to meet the requirements of the model bye-laws. *F. R. Docking.*

612 **Rainwater Trap** (Bellman's). With special form of Hopper. *Bellman & Co.*

613 **Yard Gulley.** For intercepting sediment.
A Opening for surface grating.
B Outlet to drain.

614 **Trap** (Mansergh's), with cast-iron grating and cover. *Doulton and Co.*

615 **Gulley** (Dean's) with bucket for removal of deposit.

616 **Grease Trap** (Bolding's), with cast-iron top and gun-metal screw cap for inspection, four 2-inch inlets for waste pipes, and 3½-inch inlet for flush pipe from automatic flush tank. *J. Bolding and Sons.*

617 **Grease Trap,** with two inlets for sink wastes, iron grid, and 3-inch inlet for flushing pipe. This trap is designed to be used with an automatic flush tank. *Bowes Scott and Western.*

618 **Gulley.** Cast-iron (Clarke's), with removable iron bucket. *Clark and Co.*

630 **Disconnecting Trap** (Weaver's). Section marked as follows:—
A Inlet from drain.
B Outlet to sewer.
C Air inlet.
D Inspection or ventilation connection.
Stiff and Sons.

631 **Disconnecting Trap** (Potts'), "The Edinboro'," with channel and cast iron grating for the admission of fresh air at the ground level. *Potts and Co.*

632 **Disconnecting Trap** (Hellyer's), 4-inch, with inlets for soil pipe and two branches, and inspection cap on outlet. *Doulton and Co.*

633 **Disconnecting Trap** (Buchan's), 4-inch. This trap has a 2-inch fall at the inlet for self-cleansing. *J. & M. Craig.*

634 **Disconnecting Trap** ("The Improved Kenon"), (Prof. Corfield's design), specially suitable for deep manholes. The cross section of this trap varies from U shape at the inlet to oval at the well and to O at the outlet, for self-cleansing. *Messrs. Crapper and Co.*

635 **Disconnecting Trap** (Rogers Field's design). This trap is specially designed for use in connection with an inspection chamber (see one fixed in position in model of house drainage). *Broad and Co.*

636 **Disconnecting Trap** (section), (Winser's), with water line of trap indicated. *Cliff and Sons.*

637 **Disconnecting Trap** (section). "The Beaneliffe." 4-inch, with the water line of trap indicated. *Cliff and Sons.*

638 **Disconnecting Trap** (Gotto's design), for use at or near the surface, with a specially enlarged air inlet. *Doulton and Co.*

639 **Disconnecting Trap**. Specimen of a defective trap, removed from main drain of a house built in 1884, in a district in the vicinity of London where the model bye-laws are in force. OUTLET 4½ inches HIGHER THAN INLET.

650 **Cast Iron Sink Trap,** with hinged grating on the principle of a dip stone trap.

651 **Zinc D Trap.** Specimen of an old zinc trap with zinc safe combined, and lead and zinc wastes entering trap. *Prof. W. H. Corfield.*

652 **D Trap** (Section). Specimen of an old lead D trap, with waste entering at back below water level.

653 **D Trap** (two Sections), taken from under valve closets. *Dent and Hellyer.*

654 **D Trap.** Specimen showing perforations in the upper part caused by the action of foul air.

655 **D Trap.** Specimen of an old lead D trap with curved outlet.

656 **Trapped Over-flow and Standing Waste** (lead). This specimen was taken from a water cistern; the arrangement at the mouth of the pipe was for excluding sewer-air, but would be ineffective unless supplied with water.

657 **Overflow Trap,** lower part of lead overflow trap.

658 **D Trap** (lead), with two wastes entering below water-level, and small ventilating pipe from top of soil pipe branch.

659 **D Trap** (in glass case), showing collection of deposit below the water level and spots above attacked by foul air. *W. J. Bassett.*

660 **D Trap** (heavy), showing connection for waste pipe below water-level

661 **Improved Lead D Trap,** with two wastes entering below the water-level, showing an attempt to improve the old form of D trap to make it self-cleansing.

662 **P Trap, Lead.** Specimen with waste pipes connected. *W. Eassie,* C.E.

663 **P Trap, Lead.** Specimen with three wastes connected. *W. Eassie,* C.E.

664 **D Trap, Lead.** This lead connected with zinc soil pipe, the upper part of the pipe being destroyed by perforation, removed from a country house. *Ernest Turner,* F.R.I.B.A.

665 **Dip Trap** (sheet lead), removed from under the floor of a pantry in a country house; the waste pipe from the pantry sink discharged into it. The trap was supported by a wooden casing. *Prof. W. H. Corfield.*

666 **Faulty Joint** (specimen) showing faulty joint connecting iron and lead pipes.

Dry Closets.

680 **Portable Commode** (Moule's), with hopper for dry earth, ashes, or other material used, mechanical spreader for same, and a receptacle for excreta. *The Moule's Patent Earth Closet Company, Limited.*

681 **Portable Commode,** with Hopper for dry earth, ashes, or other material used, mechanical spreader for same, and a receptacle for excreta. *John Parker.*

682 **Ash Closet,** cinder-sifting, self-acting (Morrell's), half sized model *Morrell's Sanitary Appliance Company.*

683 **Privy, Cottage** (model), showing system of ventilation adopted by medical officer of health for the West Kent Sanitary District. *C. O. Baylis,* M.D.

Sewage Treatment and Disposal.

690 **Oak Pail,** with spring lid, for removing excreta, where a system of periodic collection is adopted. *B. B. Harescough and Co.*

691 **Galvanized Iron Pail,** with spring lid, for the periodic collection of excreta. *E. Morris and Sons.*

692 **Galvanized Iron Pail,** with cam action lever for pressing down the lid and making it air-tight

693 **Hose Connections.** Two specimens (Talard's), used for connecting the hose of receiver to the hose of cesspool, where the periodic emptying of the cesspool is effected by suction into an air-exhausted tank or receiver, a system which is in operation at Paris and other Continental towns.

694 **Valve,** used in drains where sewage is disposed of by irrigation.

695 **Sludge** (three samples in bottles), showing the condition of sludge after treatment, taken from the Leyton sewage works.

696 **"Shone" Hydro-Pneumatic Sewerage and Water Supply** (two diagrams). In this system of distributed stations for the lifting of sewage, worked from one central station by means of compressed air, the whole drainage area is divided into a number of districts, each with its separate outfall and discharging station, operated by means of an ejector; the discharge from all the stations converging into one common main leading to the common outfall. The ejector is a large closed iron vessel worked automatically by compressed air. The same principle is applied to water supply, the compressed air imparting the necessary "head" for supply in lieu of natural "head" from water tower or high reservoir. *Hughes, Lancaster, and Co.*

697 **Sewage Disposal by Sub-Irrigation.** A working model. The slop-water from a sink is collected in an automatic flush tank, and thence discharged into open-jointed pipes laid below the surface of a garden, when the sewage will force itself out of the joints into the soil and feed the vegetation. The arrangement shown is only suitable for slop-water from cottages, but, by a special modification, it can be made available for the entire sewage of a country house. For a detailed description of Sub-Irrigation, see "International Health Exhibition Handbook," vol. I., page 281. *Rogers Field,* M.INST.C.E.

CLASS III.—HEATING, LIGHTING AND VENTILATING.

Several of the most important features in this Class are practically illustrated by appliances fixed in various parts of the buildings in actual use, including gas, coal, open and closed stoves, several patent gas burners and ventilators.

THE CLASS IS ARRANGED UNDER THE FOLLOWING SUB-HEADS:—

Heating Apparatus.	Lighting, including Electric Lighting.
Cooking Apparatus.	Ventilating Gas Burners.
Smoke preventing Appliances.	Ventilators.

Heating Apparatus.

710 **Gas Stove,** "The Gurney" (Southby's). *The London Warming and Ventilating Company.*

711 **Gas Stove,** "Lux Calor," for lighting and warming small compartments. This has no flue to remove the products of combustion. *Ritchie and Co.*

712 **Gas Stove,** "The Calorigen" (George's), with flues for the inlet of fresh air and the outlet of waste products. *J. F. Farwig and Co.*

713 **Gas Stove,** "The Calorigen" (George's), with flues for the inlet of fresh air and the outlet of waste products, fitted up in working order in the Secretary's office. *J. F. Farwig and Co.*

714 **Gas Fire** (Fletcher's New Incandescent Ball Fire, with Regenerator), with asbestos fibre above the burner, which becomes incandescent and both aids the combustion and gives a cheerful appearance. *Thos. Fletcher and Co*

715 **Gas Stove,** "The Euthermic" (Dr. Bond's), fitted in corridor, with flues for the inlet of fresh air (which is warmed and distributed) and for the outlet of waste products. *Dr. F. T. Bond.*

716 **Gas Stove** (Cox's), a large circular stove provided with inlet for fresh air and outlet for waste products. *Cox and Co.*

717 **Gas Fire** (Fletcher's) (small), a larger specimen of these gas fires is fitted up in working order in the Secretary's office. *Thos. Fletcher and Co.*

718 **Oil Stove,** "Lux Calor" (Ritchie's), for lighting and warming small compartments. *Ritchie and Co.*

719 **Oil Stove,** for greenhouses, with an arrangement of pipes for distributing heat by means of the circulation of hot water. *S. P. Catterson.*

720 **Chaufferette, or Foot Warmer,** used by stall women and lodge keepers at Paris, with specimen of charcoal used. *T. Twining.*

721 **Ventilating Stove** (Sir Douglas Galton's design). *Yates, Haywood and Co.*

722 **Slow Combustion Stove.** *Barnard, Bishop and Barnard.*

723 **Grate,** designed by T. Pridgin Teale, with closed air chamber below fire, for economy of fuel.

724 **Convoluted Stove,** arranged to give a large heating and radiating surface to each square foot of grate space. *Joseph Constantine.*

725 **Hygiastic Ventilating Fire Grate,** as used by the London School Board. *D. O. Boyd.*

726 **Fireclay Grate,** with register. *F. Edwards and Son.*

727 **Stove,** Woodcock's improved Gurney, circular in shape, with sliding doors and flanges for radiating heat. *London Warming and Ventilating Company.*

728 **Tubular Pillar** for hot water or steam. *Jones and Attwood.*

729 **Ventilating Block and Lintel Flue,** fireclay. *Geo. Jennings.*

730 **Ashes in Glass Bottles.** Showing the result of 42 hours' burning in an ordinary stove, fitted with a Pridgin Teale's economiser and also the result of $\frac{1}{3}$ day without economiser. *T. Pridgin Teale.*

731 **Fuels.** A selection of various kinds of coal, coke, peat, and patent fuels. *Rickett, Smith and Co.*

732 **Smokeless Fuel.** *Peters, Bartsch and Co.*

733 **Frost-defying and non-evaporating Liquid** (Patent), for distributing heat, cold or pressure and for maintaining a regular water line in wet gas meters *W. Stainton.*

734 **Asbestos Fibre**, used in gas fires for producing a cheerful appearance.

735 **Asbestos Lumps**, used in conjunction with gas for making gas fires.

736 **Asbestos**, for packing pipes and flues, for preventing the radiation of heat, and protecting adjacent wood or other materials.

737 **Flue Elbows, Adjustable** (six specimens) in various sizes.

738 **Fireclay Flue** (circular), 9-inch. *Doulton and Co.*

739 **Fireclay Flue** (circular), with outer casing (square), 9-inch. *Geo. Jennings.*

740 **Flue** (square), with tiles, inlet in front.

741 **Flue** (circular), stoneware.

742 **Water Heater,** Instantaneous (Fletcher's). (Fixed over bath in corridor.) This heater is provided with a powerful atmospheric gas burner, which raises the temperature of water from 60 degrees to 110 degrees, at the rate of about two gallons per minute. A flue is also provided for carrying off the waste products from the gas. *Thomas Fletcher & Co.*

743 **Stove Ventilating, Glazed Terra Cotta,** decorated, with feed door and regulating air inlet, giving control over the rate of combustion. *Doulton & Co.*

744 **Stove Ventilating,** fixed on ground floor of Museum. Iron, with feed hopper and air valve for regulating the rate of combustion. The front of this stove is fitted with mica, enabling the fire to be seen. *Rosser and Russell.*

745 **Grate, Glazed Terra Cotta,** complete with mantel, shelf, hearth, and fender. Fixed and used at platform end of Museum. *Doulton and Co.*

746 **Grate,** designed to combine the advantages of open and closed fire, fixed in library. *H. Heim.*

Cooking Apparatus.

760 **Oil Cooking Stove** (Rippingille's). Two 6-inch burners, cast-iron top, with oven and two boiling openings. *The Albion Lamp Co., Limited.*

761 **Gas Cooking Stove** (Fletcher's), with grill, hot plate, large oven, and packed, double, non-conducting casing. Porcelain enamelled. *Thos. Fletcher and Co.*

762 **Kettle** (Quelch's), enamelled.

763 **Saucepan** (Keen's), enamelled with ventilated lid. *A. G. Keen.*

764 **Grill,** enamelled.

765 **Coffee Pots** (five specimens), showing various forms of lamps, and arrangements for making coffee. *T. Twining.*

Smoke Preventing Appliances.

Gas Stoves and Gas Fires. *See* Heating Apparatus

Smokeless Fuels. *See* No. 732.

Lighting.

790 **Reflector** (Chappuis'). For reflecting daylight or artificial light. *Chappuis and Co.*

791 **Pavement Lights** (Hayward's). Specimen of lens lights fixed in floor of gallery. *Hayward Bros. and Eckstein.*

792 **Pavement Lights** (Hyatt's). Two specimens fixed in floor of gallery. *J. Hyatt.*

793 **Pavement Lights** (Hyatt's). Specimen with octagon lights and octagon tiles inlaid between. *J. Hyatt.*

794 **Prisms and Lenses** for pavement lights, various shapes for directing the light into particular directions. *Hayward Bros. and Eckstein.*

800 **Gas Burner** (Sugg's). Group of 9 table-top burners. *W. Sugg and Co.*

801 **Gas Burner** (The Wenham), fixed in roof of Museum, with by-pass for self-lighting. *The Wenham Co.*

802 **Gas Burner** (Siemen's), fixed in roof of Museum with by-pass for self-lighting.

803 **Gas Burner, Incandescent,** fixed on bracket at end of Museum under gallery and in Experimental Corridor. *The Incandescent Lamp Co.*

804 **Gas Burners, Regulating** (Sugg's), four fixed in side corridor. *W. Sugg and Co.*

805 **Gas Burners, Reflex.** Two 6-light and one 8-light burners fixed in Library. *J. Stott and Co.*

806 **Gas Meter, Dry** (Glover's). 80 lights fixed at entrance to Museum.

807 **Gas Regulator.** Section showing internal arrangements for diminishing the inlet of gas as the pressure increases. *Shaw and Son.*

808 **Gas Regulator** (Stott's). Two specimens, one fixed near gas meter at entrance, controlling the gas supply of Museum. *J. Stott and Co.*

809 **Gas Valve.** (Joy's). Safety valve for regulating the gas supply. *W. H. Coulter.*

820 **Lamp for Mineral Oil** (Shaftesbury Safety), hand lamp and standard lamp, with automatic cap for extinguishing the lamp if upset. *Shaftesbury Lamp Co.*

821 **Lamp for Mineral Oil** (Defries' Safety), with metal reservoir, and wick encased in tube (*See* No. 824). In the Standard lamp air is supplied to the middle of the flame by means of a tube passing through the oil reservoir. In the hand lamp an automatic safety cap is added.

822 **Oil Lamp** (the Wanzer), fitted with a mechanical arrangement to supply air to the point of combustion, dispensing with the necessity for a chimney. *The Wanzer Lamp Co.*

823 **Oil Lamp,** with metal reservoir and casing tube to lower part of wick.

824 **Oil Lamps,** three specimens of cheap lamps. The proximity of the flame to the reservoir, and the imperfect fitting, which allow vapour from the lamp to reach the flame, render lamps of this form dangerous. In one of the specimens the danger is greatly lessened by the addition of a safety tube enclosing the wick nearly to the bottom of the oil reservoir, so as to prevent the vapour from the surface of the oil rising up beside the wick.

830 **Glazing.** Lantern over entrance corridor, showing method of glazing without putty. *The British Patent Glazing Company.*

Windows. Several models of windows will be found in Class I. ("Construction"), illustrating the methods adopted for lighting and ventilation at the principal London hospitals.

Ventilating Gas Burners.

840 **Gas Burner, Pendant, Ventilating.** Three specimens fixed in entrance corridor, connected to shafts for carrying off the products of combustion. *Benham and Sons.*

Ventilators.

850 **Fresh Air Ventilator, Inlet** (Crosse's), fixed in model wall with tray for deodorant. *H. W. Crosse.*

851 **Circular Ventilator,** "The Universal," for fixing in window. *Capt. Wintour.*

852 **Ventilator,** designed by Dr. Langstaff, for disinfecting and ventilating purposes and for the treatment of disease. *C. Langstaff,* M.D.

853 **Ventilating Tube** (Livesey's), with inlet grating and screen.
A.—Angular fixed near door of Museum.
B.—Rectangular.
Sanitary Engineering and Ventilating Co.

854 **Ventilators** (Currell's).
A.—Door Inlet for Stables (fitted to Model Door).
B.—Window Inlet (fitted to Model Sash Bar).
C.—Window and Door Inlet (Brass).
D.—Window Inlet, fitted to Model Sash Bar.
E, F, G.—Other forms of Window and Door Inlets.
W. Tonks and Sons.

855 **Ventilating Fan** (model), for mechanically producing movements of air. *General Franzini.*

856 **Ventilator** (Eyre's), inlet or outlet, with flap to prevent back-draught. Two specimens 9in. by 3in. and 9in. by 6in.

857 **Ventilator, Bracket, Inlet** (Currah's). Two specimens, plain and ornamented, with regulating valve and indicator. *Baxendale and Co.*

858 **Ventilator and Radiator** (Ellison's), drawer shaped, with divisions to divert the current of air. *J. E. Ellison.*

859 **Ventilators** (Crossley's).
A.—Louvre Inlet. | B.—Louvre Outlet, with Regulator.
C.—Valve (Outlet), self-acting.
D. Crossley.

860 **Ventilator** (Arnott's). *Hart, Son, Peard and Co.*

861 **Ventilator** (McHaffie's), designed to be self-regulating against excessive external pressure. *Hart, Son, Peard and Co.*

862 **Ventilators, Sliding, or Hit-and-Miss,** for the admission of air through floors or skirtings. *Hart, Son, Peard and Co.*

863 **Ventilator, Drawer shaped, Inlet,** with separate channels for difusing the air, and screen for cleansing the same. *C. R. Stevens.*

864 **Ventilators, Conical** (Ellison's).
A.—Model of Skirting, perforated with conical holes.
B.—Terra-cotta Air Grating, with conical holes.
C.—Conical Air Brick, ditto Section, and Apparatus for demonstrating the efficiency of this method of introducing air without draught.
J. E. Ellison.

865 **Air Grating, Terra cotta.**

866 **Air Gratings, Iron.** Three specimens.

867 **Ventilating Bracket,** with air cleansing water box and hinged air grating (fixed near entrance to Museum). *Sanitary Engineering and Ventilating Co.*

868 **Mica Flap Ventilator** (Hayward's), frequently used as an inlet to a flue where a back draught is undesirable. *Hayward Bros. and Eckstein.*

869 **Mica Flap Ventilator** (Hayward's), with hit-and-miss arrangement to control the action of the same. *Hayward Bros. and Eckstein.*

870 **Sherringham's Improved Ventilator** (Hayward's), with cord and handle for opening and closing. *Hayward Bros. and Eckstein.*

871 **Ventilator, Louvre** (Hayward's), with ratchet actio for opening and closing. This ventilator can be reversed to act as an inlet. *Hayward Bros. and Eckstein.*

872 **Ventilator, Louvre** (Hayward's), with circular action for opening and closing. This ventilator can be reversed to act as an outlet. *Hayward Bros. and Eckstein.*

873 **Air Inlet-Tube,** made in cast-iron, with regulating valve and access door at foot for clearing. *Hayward Bros. and Eckstein.*

874 **Ventilating Cowl** (Jones'). 3-in. single chamber and 3-in. double chamber. *J. Jones.*

875 **Revolving Ventilating Cowl.** *Scott, Dunn and Co.*

876 **Revolving Ventilating Cowl** (Scott's).

877 **Revolving Ventilating Cowl** (Howorth's). Model with glass panel, showing internal arrangement of archimedean screw. *Jas. Howorth.*

878 **Up-cast Ventilating Cowl** (Kite's), 3-inch. *Kite and Co.*

879 **Air Pump** (model) (Boyle's). *Boyle and Co.*

880 **Air Exhaust** (models) (Buchan's). *W. P. Buchan.*

881 **Air Exhaust** (model) (Hall's). *D. T. Bostel.*

882 **Ridge Tile Ventilator,** Terracotta.

883 **Ridge Ventilator** (Hamilton's), for fixing in ridge of roof.

884 **Window Ventilator** (Cooper's), model showing revolving disc and hit-and-miss arrangement. *Cooper and Co.*

885 **Window** or **Door Ventilator** (Cooper's), model showing louvre and method of opening. A larger specimen is shown in action in entrance door of Museum. *Cooper and Co.*

886 **Window Ventilation,** model of window with simple costless ventilator applied. *P. Hinckes Bird,* F.R.C.S.

888 **Cowl,** with bird's nest. Removed from the top of a lead soil pipe *J. H. Catten.*

Window Construction for Ventilation, &c. Several models of windows as constructed for and in use at the principal London Hospitals, including St. George's, Middlesex, St. Thomas's, Guy's, and London. *See* Nos. 100 to 107 of this Catalogue.

Ventilated Lid for Water Closets (designed by H. Saxon Snell, F.R.I.B.A.) *See* No. 115.

Ventilation of War Ships. A series of drawings of H.M.S. *Agincourt, Victor Emanuel, Dreadnought, and Indian Troopships* (large scale), illustrative of the systems of ventilation carried out on these vessels. *See* No. 34. Folio **T.**

Ventilation of Public Buildings. Drawings. *See* No. 34, Folio **U.**

Ventilation of Prison. *See* model No. 36.

Ventilation of House Drains, Closets, Soil Pipe, Inspection Chamber. *See* full-sized model, No. 490.

Ventilating Stoves and Grates. *See* Heating Apparatus.

Air Inlets for House Drainage, with mica flap to prevent back draught (*see* drain accessories on pages 30 and 32).

DIVISION D.

PERSONAL AND DOMESTIC HYGIENE.

The section devoted to Foods has been specially arranged by Mr. Thos. Twining, of Twickenham, and nearly the whole of the specimens exhibited in this section are presented to the Museum by him.

THE DIVISION IS ARRANGED UNDER THE FOLLOWING HEADS:—

Clothing.
Beds and other Furniture.
Hospital and Sick Room Appliances.
Domestic Appliances.
School Fittings.
Gymnastic Apparatus.
Foods.
Domestic Filters.
Mineral Waters.
Soaps and other Detergents.
Antiseptics and Disinfectants.
Disinfecting Apparatus.

Clothing.

900 **Funeral Cloaks.** Two specimens with hoods for protecting the head in inclement weather. *T. Twining.*

901 **Nottingham Scarf.** Three specimens with model to illustrate the method of using same. *T. Twining.*

902 **Manchester Goods.** Two specimens of this material, one as sent out from the maker, the other, 76½ square inches, after washing, showing a loss in weight by washing equal to 221 grains

903 **"Edith" Corset,** pure woollen, long waist.
904 **"Alexandra" Corset,** pure woollen knitted.
905 **Ladies' Vest,** double-breasted, short sleeves.
906 **Ladies' Night Dress,** pure woollen, warm.
907 **Ladies' Combination Garment,** pure woollen, light and warm.
908 **Pure Woollen System of Clothing.** Dr. Jaeger's book describing same.

Jaeger's Sanitary Woollen System Co

909 **Ladies' Combination Garment,** cellular cloth, cotton, porous. *Cellular Clothing Co.*

910 **Cellular Cloth.** Pattern book with pamphlet describing same. *Cellular Clothing Co.*

911 **Diagram** of natural waist and waist contorted by tight lacing.

912 **Child's Shoes,** with ordinary pointed toes. *Dowie and Marshall.*

913 **Child's Shoes,** made to fit a natural-shaped foot. *Dowie and Marshall.*

914 **Cast of Child's Foot.** Copy of child's foot in its perfect natural state. *Dowie and Marshall.*

915 **Skeleton of Foot,** showing the bony arch of foot with its two abutments, one at heel and the other at great toe joint. *Dowie and Marshall.*

916 **Ladies' Boots,** with high heels and pointed toes. *Dowie and Marshall.*

917 **Diagrams** (three), showing the defects in the ordinary shaped boots, and their unsuitability.

918 **Cast of Foot,** showing the malformation of great toe joint through wearing the ordinary pointed boots. *Dowie and Marshall.*

919 **Cast of Foot,** with sandal, showing the perfect development of foot. *Dowie and Marshall.*

920 **Boots, Men's,** patent leather, with ordinary pointed toes. *Dowie and Marshall.*

921 **Boots, Men's,** with inner line straight to allow the great toe to retain its natural shape. *Dowie and Marshall.*

922 **Hose,** with separated toe-spaces, made in natural undyed wool. *Jaeger's Woollen Clothing System Co.*

Beds and other Furniture.

940 **Eider Down Quilt,** with holes for ventilation.

941 **Blanket Chartaline.** *H. Leigh Slater.*

942 **Bed** (model). Woollen flock. *Gainsford and Co.*

943 **Mattress** (model). Woollen. *Gainsford and Co.*

944 **Mattress** (model). Hair, *Gainsford and Co.*

945 **Chain Mattress,** (model), on strong wooden frame, with arrangement for tightening same. *Chorlton & Dugdale.*

946 **Iron Bedstead** (model), with sloping canvas, on wheel and ratchet roller for tightening same. *Thos. Allen.*

947 **Seat,** on hinged pedestal, for economising space. Designed for use in shops for attendants. *Colman and Glendenning.*

948 **Reclining Chair,** Liebrich's design. *Callaghan and Co.*

Hospital and Sick Room Appliances.

960 **Bed Pan** (earthenware), for the sick room. *Dr. J. C. Steele.*

961 **Bed Slipper** (earthenware), for the sick room. *Dr. J. C. Steele.*

962 **Bed Urinals** (two specimens) (earthenware), for the sick room. *Dr. J. C. Steele.*

963 **Trays** (earthenware), used in dressing wounds for ordinary surgical operations. *Dr. J. C. Steele.*

964 **Tray** (ebony), used in dressing wounds for ordinary surgical operations. *Dr. J. C. Steele.*

965 **Nursery,** or **Travelling Convenience.** *J. Allen and Son.*

966 **Bandage Winder** (model). *Dr. J. C. Steele.*

967 **Bedpan Cage** (model), used for keeping stools for inspection of medical men. *N. H. Nixon, Secretary, University College Hospital.*

968 **Tubular Bed** (model). *Pocock Bros.*

969 **Invalid Apparatus** (model), for enabling an invalid to raise himself in bed.

970 **Bed Rest** (model), with foot rest. *N. H. Nixon, Secretary University College Hospital.*

971 **Vaporiser,** with lamp. *Jas. Allen and Son.*

972 **Vaporiser,** for use in the sick room. *Jas. Allen and Son.*

973 **Ambulance Carriage** (model) as used at the Middlesex Hospital.

974 **Lamp** for generating heat with safety under bedclothes. *Dr. J. C. Steele.*

975 **Turkish Bath Apparatus,** portable, for use in sick room. *Jas. Allen and Son.*

976 **Folding Shade,** portable, for protecting persons with weak eyes from strong lights. *T. Twining.*

977 **Guide and Rest** for assisting the short sighted in writing. *T. Twining*

978 **Chair** with simple contrivance for carrying invalids. *T. Twining.*

979 **Crutches.** Two specimens of India rubber ends for crutches.

980 **Crutches,** cheap, improved (three specimens). *T. Twining.*

981 **Mesopodium,** or **Saddle Stick** (five specimens), for supporting the weight of the body when using crutches. *T. Twining.*

Domestic Appliances.

990 **Hygienic Towel** (Fell's), designed to retain its frictional qualities when wet or dry, and to lose none of these qualities by ordinary wear. *Fell and Co.*

991 **Flesh Gloves** (Fell's), designed to retain their frictional qualities wet or dry, and for their whole useable period. *Fell and Co.*

992 **Coal Box** (model), suitable for public buildings, forming a convenient seat. *Dr. J. C. Steele.*

993 **Destructor for House Refuse** (model) (Tupper'sPatent),showing its adaptation to an ordinary kitchen range. *W. Tupper.*

994 **Ash-Bin and Sifter** (model). Suitable for large institutions.

995 **Dust Shoot** (Smeaton's). *J. Smeaton and Sons.*

996 **Sash and Picture Line** (Hookin's), various specimens of new and one specimen of old. *W. Tonks and Son.*

997 **Butter Cooler and Butter Dishes**, various simple and inexpensive forms. *T. Twining*

998 **Iron Stand for Laundry Purposes.**

999 **Foot Warmer**, filled with chemical heat-retaining fluid. *Peters, Bartsch and Co.*

Self-Locking Coal Plates. Two models and one actual size, with glass top. (*See* also No. 115).

School Fittings.

1000 **School Desks and Seats.** A set of models showing

Adjustable chair and desk.
Seat and desk.
Two form of seats.
Long form seat with desk.
Desks, single with and without seats.

Colman and Glendenning.

1001 **Seat** (model), for school yards, parks and recreation grounds. *Colman and Glendenning.*

Demonstration Models. "The South Kensington Lecture Cabinet." *See* No. 19

Demonstration Model of House Sanitation. *See* No. 20.

Gymnastic Apparatus.

1010 **Home Gymnastics Apparatus** (Bacon's), with pamphlet of instructions based upon Dr. Schreber's system. *G. W. Bacon and Co.*

1011 **Models**, illustrating the elementary movements of the body, used in the physical education of the blind. *Dr. Roth.*

Foods.

NOTE.—All exhibits in this section, not otherwise marked, have been presented by *Mr. Thos. Twining, of Twickenham.*

1020 **Preserved Meats** (*Two Cases*). Various specimens, including edible bird's nests, soups, extracts, beef, veal, mutton, pork, bacon, sausages, hare, rabbit.

1021 **Fish, Crustacea and Mollusca.** Various specimens in bottles, with shells of oyster, whelk, cockle, razor fish, scallop, &c.

1022 **Eggs, Butter and Cheese.** Various specimens of each, with models of apparatus used in the manufacture of cheeses on the continent.

1023 **Cereals** (*Two Cases*), including wheats (various), flours and preparations from wheat, brans, hominy, macaroni, vermicelli, rye, barley, oats, oatmeal, rice, maize, millets, penicillaria, manna kroup, dari.

1024 **Breads.** Various kinds of bread, dough raisers and flour adulterants, including specimen of bread used during Siege of Paris, 1870, pumper nickel, &c.

1025 **Biscuits.** Various kinds.

1026 **Rice and Wheat.** Various samples.

1027 **Cereals in their natural state**, including wheat, Egyptian wheat, rye, barley, oats, maize (various), penicillaria, sorghum, morbete.

1028 **Cereals.** Showing the comparative analyses of buckwheat, quinoa, durra, rice, millet.

1029 **Legumes, Roots, &c.** Showing the comparative analyses of peas, haricots, lentils, potatoes.

1030 **Cereals and Pulse.** Various samples, principally British Indian.

1031 **Pulse, &c.** (*Two Cases*), peas, lentils, beans, haricots, Indian pulse, amaranthus quinoa, buckwheat, asparagus, potatoes, including a number of models, presented by *Sutton and Sons.*

1032 **Roots and Bulbs**, potatoes, artichokes, turnips, kohlrabi, parsnips, salsify, beet, leeks, onions, carrots, oxalis, radishes, mandioc (specimens of the Colorado or potato beetle).

1033 **Salads, &c.**, cryptogams, tomatoes, marrow, cucumber, gherkin, Brussels sprouts, celery, spinach, lettuce, watercress, endive, colewort. Several of the specimens are represented by models presented by *Sutton and Sons.*

1034 **Vegetables** (models). Including parsnip, cauliflower, savoy, melon, carrot, cabbage, vegetable marrow, cucumber, Egyptian turnip, onion, leek. *Sutton and Sons.*

1035 **Milks.** Showing the constituents of the following milks, cow's, woman's, goat's, ass', mare's. *Aylesbury Dairy Co., Ltd,*

1036 **Uncommon Foods, &c.** Including cinchona, Japanese isinglass, tonquin bean, odika bread, guava jelly, oil palm, kola, papain, coca, pemmican, capraria, yerba mate, kokum-butter pepper stick, &c. *Thos. Christy and Co.*

1037 **Miscellaneous** (specimens). Including cereals, pulse, oils, fibres, dyes. *Carter and Co.*

1038 **Food for Invalids and Infants.** Including various diabetic preparations. *G. Van Abbott and Son.*

1039 **Fruits, Preserved** (*Two Cases*), including bergamot, chinensis, bread fruit, bingai, citron, mangosteen, pineapple, persea gratissima, custard apple, betel nut, jack fruit, lemons, oranges, figs, litchi, crab oil, lansat, mangoes, guava, grapes, etc. Durion, pine, mamey, forbidden Fruit, cacao pod. *Kew Museum of Economic Botany.*

1040 **Fruits** (preserved, and models). Including bergamot, lime, lemon, pine, banana, oranges, pomegranate, olives, grapes, sultana, muscatels, raisins, currants, figs, mulberry, date, cherries, plums apricots, pears, apples, pippins, cranberries, hips and haws, raspberries, strawberries, gooseberries, &c.

1041 **Nuts** including Brazil, almonds, Sapacaya, Spanish, Kentish, walnuts, chestnuts, dika, hickory, peggan, earth, caju, cocoa, pine, Suwarrow, nelumbum, pachyma, cocos.

1042 **Tropical Fruits** including bread fruit, peach, longans, buah Malakka, lansat, carambola, mango, elephant apple, quince, egg plant, tamarinds, ber fruit, custard apple, gombo.

1043 **Secreted and Extracted Products** (*Two Cases*). Divided into sections, including starch, gluten, gum, sugar, honey.

1044 **Cakes**, various kinds.

1045 **Sweetmeats**. Various specimens, including specimens of colouring matter used in their manufacture.

1046 **Raw Sugars** various kinds, with descriptive and coloured diagrams, showing the sugar plant and sections of cane.

1047 **Flavouring Herbs**. Including basil, mint, thyme, savory, marjoram, sage, hyssop, parsley, mangold, saffron, fennel, caraway, dill, cumin, coriander.

1048 **Condiments**, including vinegars, sauces, pickles, fats and oils.

1049 **Stimulants and Spices**, including mustards, turmeric, cardamoms, capsicums, chillies, pepper, cloves, cinnamon, ginger, nutmeg, cassia.

1050 **Narcotics** and **Masticatories**, including various kinds for smoking, snuffing and masticating.

1051 **Spices, Condiments and Herbs**, with specimens of various tobacco leaves and coloured drawings of plants.

1052 **Beverages** (*Three Cases*), including teas, coffees, cocoas, chicory, chocolate, and adulterants.

1053 **Refreshing Drinks** (*Two Cases*), including fruit syrups, magnesia, orgeat, liquorice, cream of tartar, pearl barley.

1054 **British Wines**, various.

1055 **Fermented and distilled Liquors** (*Two Cases*), including malt, hops, ales, liquors, liqueurs, cordials, flavourers.

1056 **Physiological Diagrams.** Illustrating the structure of the human body, including skeleton, skin, and organs of touch, nails and hair, arterial and venous blood, cellular structure, jaws and teeth, alimentary canal.

1057 **Thermometric Scales.** Diagrams (large and small) showing comparative readings of Fahrenheit, Reaumer and Centigrade.

1058 **Animal Kingdom.** Diagrams illustrating the scientific classification into sub-kingdoms, provinces, classes, and orders.

1059 **Animal Kingdom.** Coloured drawings of mammalia, birds, bees, reptiles, fishes, crustacea, &c.

1060 **Vegetable Kingdom.** Diagrams, illustrating the scientific classification into sub-kingdoms, divisions, classes, sub-classes, orders, and sub-orders.

1061 **Vegetable Kingdom.** Coloured drawings of condiments, fruits, fungi.

1062 **Food Analyses.** Tabulated Cards, showing constituent elements of various foods, daily supply and waste, day's rations, &c. *South Kensington Museum.*

1063 **Butchers' Joints.** Diagram showing principal joints in ox, calf, sheep and pig.

1064 **Meat and Bone.** Diagram showing proportionate weight of meat and bone in principal joints of beef, mutton, and veal.

1065 **Cereals.** Table showing proximate analyses of important cereals.

1066 **Flour Mill.** Diagram showing in section the process of flour making.

1067 **Malting and Brewing.** Diagram showing in section the processes of malting and brewing.

1068 **Constituents, Average of.** Table showing the proximate average percentage of constituents in various food articles.

1069 **Altitudes.** Diagram showing comparisons of heights at which various kinds of vegetation exist.

1070 **Wines.** Geographical classification.

1071 **Roots and Bulbs** (diagram on roller). Showing analyses of various kinds.

1072 **Vegetables** (diagram on roller). Showing analyses of various kinds.

1073 **Fruits** (diagram on roller). Showing analyses of various kinds.

1074 **Food and Nutrition,** an introduction to the food section of the Parkes Museum, by T. Twining.

1076 **Mammalia.** Coloured drawings—classified.

1077 **Birds.** Coloured drawings—classified.

1078 **Fish.** Coloured Drawings—classified.

1079 **Food-producing Plants** (folio **V.**), including roots and bulbs, cereals, fruits, starches, herbs, beverages, spices, liquors, oils.

1080 **Food Tables, Tablets and Diagrams** (folio **W.**). *South Kensington Museum Committee.*

1081 **Vegetable Physiology** (folio **X.**). Diagram showing germination, cellular tissue, systematic botany, &c.

1082 **Microscopic Diagrams** (folio X.). Showing enlargements of the following, cinnamon powder and wheat flour, oatmeal, wheat flour, marmalade, coffee, potato, mustard, peppers arrowroots, chicory, ginger, liquorice powder and wheat flour, rice flour, cocoa and potato flour, oatmeal with barley meal, rhubarb and wheat flour, cocoa, Chinese powder, la veno beno, cheese acarus, annatto sugar insect old and young, liquorice and cammony, jalap, opium, coffee, and milk. *Arthur Hill Hassall*, M.D.

Domestic Filters.

1100 **Filter, Natural Stone and Carbon.** *T. Barstow.*

1101 **Filter Rapide.** Two specimens. *Maignen and Co.*

1102 **Filter, Manganous Carbon,** with ornamental Doulton ware exterior. *Doulton and Co.*

1103 **Filter, Manganous Carbon,** small ornamental. *Doulton and Co.*

1104 **Filter** (section). *London and General Water Purifying Co.*

1105 **Filter** (section), large size. *The Sanitary Engineering and Ventilation Co.*

1106 **Filter, Spongy Iron** (model), showing arrangement of filtering, medium and internal construction. *Spongy Iron Co.*

1107 **Filter, Carbon Block** (model). *F. H. Atkins.*

1108 **Filter, Collapsible Bucket,** for packing in small compass when not in use.

1109 **Filter, Table,** in glass with carbon block and special arrangement to prevent the water running when top is removed off the reservoir. *Sanitary Engineering and Ventilation Co.*

1110 **Filter, Table,** with carbon block. *Sanitary Engineering and Ventilation Co.*

1111 **Filtering Mediums.** Glass case containing specimens of various materials used in filtering water, including animal, vegetable and mineral carbons.

1112 **Filter, Pasteur Tube.** Specimen. *Pasteur Filter Co.*

1113 **Filter, Carbon Block,** suitable for travellers. *Silicated Carbon Co.*

1114 **Diagram,** showing adaptation of Filter to house supply. *Maignen and Co.*

1115 **Water Storage Can,** designed for use in the country.

1116 **Filter.** Small model of spongy iron, showing filtering medium, its disposition, and the means of access for cleaning. *Spongy Iron Co.*

1117 **Filter** (Section under glass shade), showing filtering medium, method of placing the same, and the facilities for cleaning each part.

Mineral Waters.

1130 **Mineral Waters.** Specimen bottles of various English and foreign kinds, including St. Galmier, Giesshübler, Rakvezy, Rubmat, Vals, Salutaris, Cheltenham, Bilau, &c.

Soaps and other Detergents.

1140 **Soaps and other Detergents.**

1. Substances used in the manufacture of soap, including palm oil, Australian tallow, cocoanut oil, cottonseed oil, whale oil, glycerine, castor oil, seal oil, fish oil, menhadden oil, bone tallow, olive oil, rosin, pearlash, silicate soda, caustic potash, caustic soda.

2. Soaps, various kinds, including soft, powder, ribbon, soft green, soft figged, shavings, glycerine, olive oil, compressed ribbon, brown, carbolic, transparent, mottled, cocoanut oil.

3. Carbolic preparations, including coal tar, tar oil, glacial C.A., medical C.A., refined C.A.; crystal C.A.; and sulphocarbolates of soda, zinc, ammonium, calcium, iron, lead, magnesium, potash. *F. C. Calvert and Co.*

1141 **Soaps and other Detergents,** including dog soap (Mackey's), liquid soap (Mouilla), Emulsion (Dr. Bonneford's), ointment (Jeye's), Eucalyptol powder (Mackey's), soft soap (Sanitas), furniture cleaner (Sanitas), sea salt (J. Pennes).

1142 **Soap Ingredients** at various stages of manufacture. *Ed. Cook and Co.*

1143 **Soaps,** various, including coal tar, carbolic potash (Mackey's), dog, animal, surgical, and disinfecting (Jeye's), antiseptic (Sanitas) Pixene (J. Wheeler).

1144 **Waste Products** from the manufacture of soap, including glycerine, lye, salts. *F. C. Calvert and Co.*

Antiseptics and Disinfectants.

1150 **Disinfectants, powerful or Germicides.** Capable of destroying the most resistant microbes, under certain stated conditions of strength, temperature, and time, including fire, boiling water, steam, hot dry air, perchloride of mercury, carbolic acid, cressol, iodine trichloride, osmic acid, permanganate of potash, iodine water, chlorine water, bromine water.

1151 **Disinfectants, weak.** Capable of destroying microbes which are not in the state of spore, including the powerful disinfectants more diluted, chloride of lime, hydrochloric acid, sulphurous acid, salicylic acid, chromic acid, creasote, caustic lime, soda, and potash.

1152 **Antiseptics.** Capable of impeding or arresting the growth of microbes, but without necessarily destroying them, including sul. zinc, chloride lime, sul. copper, sul. iron, perchloride iron, boracic acid, borax, carbolic oil,* thymol,* oil of turpentine,* Eucalyptus oil.

1153 **Aerial Deodorants**, for fumigation, with description for making and using the same. Chlorine gas, sulphurous acid, nitrous fumes, ozone, Euchlorine.

1154 **Apparatus for Fumigation.**

1155 **Powders for disinfecting purposes.** Manufactured and sold by the various makers whose names are given in brackets. Sanitary powder (Jeye's), Sanitas (Sanitas Co.'s), Eucalyptol (Mackey, Mackey and Co.), chloride lime (Greenbank Alkaline Co.), surgical and tooth powder (Jeye's), carbolic acid (Mackey and Co.), Pinewood and Eucalyptus (Mackey and Co.), Boro phenol (Calvert's), kanphorkalk (A. Hornby's).

1156 **Liquids for disinfecting purposes.** Manufactured and sold by the various makers whose names are given in brackets. Phenol (Bobemf's), perfect purifier (Jeye's), terebene (Cleaver's), eucalyptol, camphorine, sulphenic acid, oxychlorogene, cresylic acid, carbolic acid (Mackey, Mackey and Co.), Emulsion (Sanitas Co.), kresyline (Mackey's), pixine (J. Wheeler).

Disinfecting Apparatus.

1170 **Disinfecting Stove, self-regulating** (Dr. Ransom's design), large working model, for surgical, medical, and obstetric hospitals, and for public institutions, as erected at the General Hospital, Nottingham. *Goddard and Massey.*

1171 **Disinfecting Chamber** (Dr. Langstaff's design), with bath and lavatory (large model), for use of nurses and others after attending infectious cases. *C. F. Langstaff*, M.D.

1172 **Disinfector, steam** (Washington Lyon's), model in glass case, showing chamber and receiver for infected articles, steam generator, and all the details of registration and regulation. *W. Lyon.*

1173 **Disinfector.** Drawing of Goddard, Massey and Co.'s, showing a section through the disinfector with all the appliances for regulating pressure and heat, also sectional elevation showing flues, &c. *Goddard, Massey and Warner.*

1174 **Disinfector** (Soper's Patent). Models of portable and drain disinfectors. *Stiff and Sons.*

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* Chiefly used as deodorants for concealing odours.

ALPHABETICAL LIST OF NAMES AND ADDRESSES OF DONORS AND MANUFACTURERS.

Abbott, Van G., & Son, 6, Duke street Mansions, W.
Addlestone Linoleum Co., 4, Holborn Viaduct, E.C.
Admiralty, Lord Commissioners of (donor).
Ahrbecker, C. H., & Son, 35, Waterloo road, S.E.
Albion Lamp Co., 69, Hatton garden, E.C.
Allen, J., & Sons, Marylebone lane, W.
Allen, Thomas, Bristol.
Anaglypta Co., 92, Great Russell street.
Angell, A. T., 14, Drayton gardens, Fulham road, S.W.
Archer Pipe Co., Avenue Mansions, Shaftesbury avenue.
Ashford & Co., Essex street, Birmingham.
Atkins, F. H., Farringdon street, E.C.
Aylesbury Dairy Co., St. Petersburg place, Bayswater.
Paatsch, C. (donor).
Bacon, G. W., & Co., Strand.
Bassett, W. J. (donor).
Banner Sanitation Co., 24, Craven street, W.C.
Barff, Prof. (donor).
Barnard, Bishop & Barnard, Norwich.
Barstow, T., Pontefract.
Baylis, C. O. (donor).
Baxendale & Co., Manchester.
Bellman & Co., Piccadilly.
Bird, Peter Hinckes (donor).
Blomfield, J. C. (donor).
Bolding, J., & Son, South Moulton street, W.
Bond, F. T. (donor).
Bostel, D. T., 73, Ebury street, S.W.
Botting, F., Baker street, W.
Boyd, D. O., New Bond street, W.
Boyle & Co., Holborn Viaduct, E.C.
Bowes, Scott & Western, Broadway chambers, Westminster.
Bradford, Thomas, & Co., Crescent Iron Works, Salford.
Braithwaite & Co., Swinegate, Leeds.
British Metal Expansion Co., 100, Queen Victoria street, E.C.
British Patent Glazing Co., 11, Bermondsey street, S.E.
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Burmantofts Company, Limited (Leeds Fireclay Co.), Leeds.
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Cooper & Co., 3, Dyer's buildings, E.C.
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Coulter, W. H. (donor).
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Crosse, H. W. (donor).

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Diespeker & Co., Holborn Viaduct.
Docking, F. R., 44, George street, Croydon.
Doulton & Co., Lambeth, London, S.E.
Dowie & Marshall, Strand, W.C.
D'Oyly & Co., Oxford street, W.
Drake, C., & Co., Limited.
Duffy & Co., 66, Storks road, Bermondsey.
Durrans, T. H., & Sons, 43, Upper Baker street, N.W

Eassie, W. (donor).
Edwards, F., & Son, Great Marlborough street, W.
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Emanuel and Sons, 57, Marylebone lane, W.
Emptage, D. (donor).
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Falcon Brass Works Co., 25, Holland street, Blackfriars.
Farwig, J. F., & Co., 4, Upper Thames street, E.C.
Fell, J. & Co., 36, Bloom street, Manchester.
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Fletcher, Thomas, & Co., Warrington.
Flower, T. J. Moss, Liverpool Chambers, Bristol.
Franzini, General (donor).

Gainsford & Co.
Goddard, Massey, & Warner, Nottingham.
Graham, Dr. (donor).
Gregson, J., 14, Bath street, Bolton.
Guy's Hospital (donor).

Harden Star Grenade Co., Cannon street, E.C.
Harland, H. (donor).
Harris, J. F. & G., Wilson street, Finsbury.
Harrisson, T. Harnett (donor).
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Hawkins, I. T. (donor).
Hayward Bros. & Eckstein, Union street, Borough, S.E.
Health Exhibition (1884) Committee (donor).
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Hett, C. L., Brigg, Lincoln.
Hitchens, R. W., & Co., 1a, Perrin's street, Ryland road, N.W.
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Holt, H. P. (donor).
Homan & Rodgers, 17, Gracechurch street, E.C.
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Hughes & Lancaster, Chester.
Hyatt, J., Farringdon road, E.C.

Incandescent Gas Light Co., 14, Palmer street, S.W.

Jaeger's Sanitary Woollen System Co., Fore street, E.C.
Jeffrey & Co., 64, Essex road, N.
Jennings, George, Stangate, Lambeth, S.E.
Jennings, Thomas, 14 Arches, Cross street, Lambeth.
Jones, John, 40, Sydney street, Chelsea.
Jones & Attwood, Stourbridge.
Judge, M. H. (donor).

Kaye, J., & Sons, High Holborn, W.C.
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Lyon, Washington (donor).

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Maguire and Son, 10, Dawson street, Dublin.
Maignen & Co., 43, Commercial street, E.
Mainzer & Kempthorne, Berners street, W.
Meakins, G. F. L. (donor).
Metropolitan Board of Works (donor).
Middlesex Hospital (donor).
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Minton, Hollens & Co., Conduit street, W.
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Morris, E., & Sons.
Moules Patent Earth Closet Co., 5A, Garrick street, Covent Garden.

North British Plumbing Co., 86, Newman street, W.

Orr, J. B., & Co., Charlton, Kent.

Pain, James, St. Mary Axe, E.C.
Parker, John, Oxford.
Pasteur Filter Co.

Peters, Bartsch & Co., Derby.
Potts & Co., Handsworth, Birmingham.
Pritchett, G. E. (donor).

Quirk, Barton & Co., 9, Gracechurch street, E.C.

Reed, Ben, & Sons.
Rickett, Smith & Co., Kings Cross
Ritchie & Co., 13, Pocock street, Blackfriars.
Roberts, E. G., Haslemere.
Roth, W. (donor).
Russell & Russell, Charing Cross.

St. George's Hospital (donor).
St. Thomas's Hospital (donor).
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Scott, Dunn & Co.
Sharp & Co., Swadlincote, Burton-on-Trent.
Shaw & Son, Oldham.
Silicated Carbon Filter Co., Battersea.
Slater, H. Leigh (donor).

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South Kensington Museum (donor).
Spencer, T. J. (donor).
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Stainton, W. (donor).
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Stevens, C. R. (donor).
Stiff & Sons, London Pottery, Lambeth.
Stott, J., & Co., Vernon Works, Oldham.
Stretton S. (donor).
Sugg, W., & Co., Vincent Works, Westminster.
Sutton & Sons, Reading.
Syer, Milton, 36, Rye lane, Peckham.

Teale, T. Pridgin (donor),
Tonks & Son, Birmingham.
Trott, H., 75, High street, Battersea.
Turner, Ernest (donor),
Tupper, W., 72, Gloucester road, Kew, Surrey.
Twining, Thomas (donor).
Twyford, T, Hanley, Staffordshire.
Tylor & Sons, 2, Newgate street, E.C.

Val de Travers Asphalte Paving Co., 14, Palmerston buildings, E.C.

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Willesden Paper Co., Willesden, N.W.
Winser & Co., Buckingham Palace road, S.W.
Wintour, Captain (donor).
Woollams, Williams, & Co., High street, Manchester square, W.
Wragg, T., & Son, Swadlincote, Burton-on-Trent.

Yates, Haywood, & Co., Rotherham.

INDEX TO EXHIBITS.

NOTE.—The numbers in this Index refer to pages in the Appendix.

GENERAL INDEX.

The numbers in brackets refer to pages in the Appendix.

CERTIFICATES OF MERIT, SANITARY INSTITUTE, 1887, 1889.

Gregson's "PERFECTUM" has no equal.

THE "PERFECTUM" Fall Pipe projects for painting behind, and *keeps walls dry;* the ears or lugs are cast on, and the Pipe is perfect and *complete in one casting;* it requires nothing but two galvanised nails to hang upon.

The 7 inch long Socket saves much time in fixing these pipes, as they will slide to *three brick joints*, there being no need for drilling and plugging or cutting of pipes.

Round pipes project 1 inch. Size 3 in. always in stock, 1/5 per yard, *less* trade discount.

THE "PERFECTUM" Rain-water Pipes are removable, the nail holes being slotted as shewn; they can be lifted over the nail heads, which are first driven into a wall joint, and the pipes hang thereon.

The long 7 inch Socket also facilitates the easy removal of these pipes, by being able to slide out middle lengths without disturbing the nails or other pipes when a defect occurs.

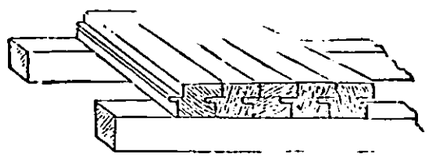
J. GREGSON, Bath Street, Bolton.

Telegrams, "PERFECTUM," Bolton.

For Prices and other Illustrations, see "Architects' Compendium."

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1885.

ANTISEPTIC, IMPERVIOUS, CONTINUOUS FLOORING.



ADVANTAGES ARE:—

Secret Nailing and Sealed Joints.
Impermeable Surface to Dust, Damp, and Germ Life.
A Durable Surface which is neither greasy nor inflammable.
Prevention of Dry Attrition of Surface. Deadening of Sounds.
Abolition of Wet Scrubbing.

MEDALS AWARDED:—International Health Exhibition, 1884.

OLD FLOOR SURFACES RENEWED, MADE IMPERVIOUS & DURABLE.

Estimates on receipt of particulars. For List of Hospitals,

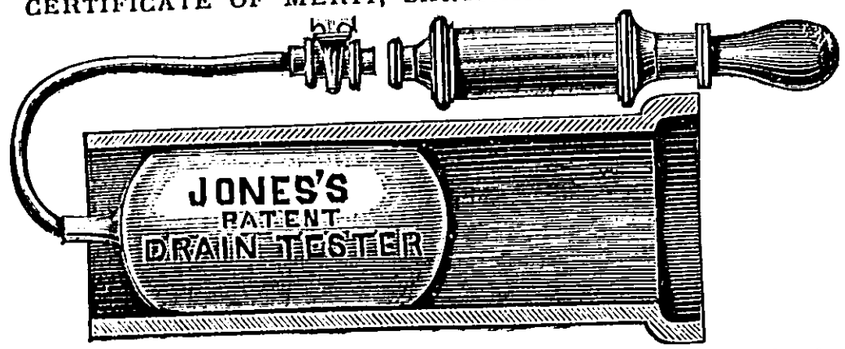
APPLY

ARTHUR JENNINGS, Sanitary Contractor,

14a, CROSS STREET, YORK ROAD, LAMBETH.

PATENT DRAIN AND PIPE STOPPER.

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1890.

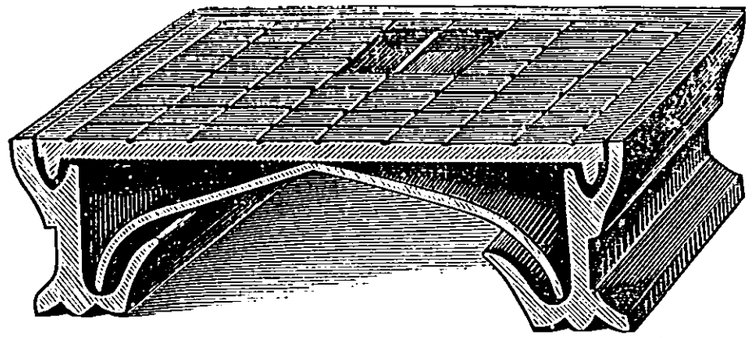


This invention consists of a cylindrical-shaped bag for stopping pipes for the purpose of testing, &c., with water, the soundness of drains, which is acknowledged to be the only reliable method. To the bag is attached a small flexible tube, with a tap at the end, connected to a small hand pump. The bag is placed in the drain before inflation, and by working the pump it is quickly filled with air, under sufficient pressure, to dam up the drain and prevent any escape of water. By turning the tap, the inflated bag remains in that state as long as required, and when done with, a half turn of the tap again releases the air, and is withdrawn. Amongst its advantages may be named its lightness and flexibility, enabling it to be folded and placed in a small bag; it can be placed in syphons and other traps, where all other stoppers fail.

PRICES ON APPLICATION.

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1890.

Patent Automatic Seal Air-Tight Man-Hole Covers for House Drains, Sewers, &c.



The covers are more simple in use, and more secure in action, than any other extant. As will be seen by the illustration, the inner cover is arched, which allows the moisture from the drain to rise to the apex of the arch, where it condenses and runs down to the groove prepared for its reception, into which the cover fits, thus forming a reliable air-tight water seal. The top cover is flat with the serface of the ground, and also fits into another groove, that may be filled with any suitable material, thus forming a second seal.

PRICES ON APPLICATION.

JOHN JONES, Sanitary Contractor,

40, SYDNEY STREET, Works—BURY STREET,
FULHAM ROAD, CHELSEA, LONDON.

Offices—68, VICTORIA STREET, WESTMINSTER, S.W.

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1890.

MOSS FLOWER'S
PATENT
Adjustable Gradient Indicator,

For laying down Gradients, & ascertaining the rate of Inclination of existing Gradients.

For Architects, Surveyors, Civil, Sanitary and Mining Engineers, Builders, Sanitary Inspectors, Clerks of Works, and others.

Indispensable in the Construction of Sewerage, Drainage, Water Works, Railways, and in Mining Operations.

Supplied to Board of Works, Ireland, Boroughs of Bradford, Blackburn, West Bromwich, Rochester, Vestry of Chelsea, Sandgate Park Colliery Co., etc., etc.

Testimonials and recommendations as to the utility of the instrument are continually arriving.

The instrument is shown on the pipe in the illustration, but it is intended that it should be used in conjunction with a straight edge.

FOR PRICE LIST, TESTIMONIALS, AND PRESS OPINIONS, APPLY TO

T. J. MOSS FLOWER, C.E.,

Consulting Sanitary Engineer and Surveyor to the Bristol, Clifton, and Wester Counties Sanitary Survey Association, LIVERPOOL CHAMBERS, BRISTOL.

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1889.

FLORADOR,

THE HIGHLY-NOURISHING FOOD,

Is acknowledged to possess constituents which place it in an enviable position as a Nourishing and Sustaining Food. The public have discovered these strength-giving properties, and are using it more frequently and largely than ever.

USE IT OFTEN AND GROW STRONG.

For Breakfast, Dinner, Tea, and Supper, you can make delicious dishes of it; while the most appetising Cakes, Buns, Custards, and Creams can be obtained by using this justly celebrated Food.

IT IS ABSOLUTELY PURE,

and—its nutritious properties fully considered—

MOST ECONOMICAL.

Large-Grained—for Porridge, Soups, Omelettes, Puddings and Children's Food.

Medium-Grained—for Baked and Boiled Puddings.

Fine-Grained—for Creams, Custards, Blanc Mange, Dainty Puddings, and Infants' Food.

BUY IT AT YOUR GROCERS OR STORES.

SIX GOLD MEDALS AND OTHER HIGHEST HONOURS.

Try the FLORADOR BISCUITS (Round and Finger)

WHICH ARE SOLD IN SMALL TINS.

MEDAL, SANITARY INSTITUTE, 1879.

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☞ *Messrs. WM. WOOLLAMS & CO. specially desire to caution Architects, Sanitary Inspectors, and the Trade against Pattern Books closely resembling their own in general appearance, and invite attention to their Sole Address, and "Trade Mark," a bale of "Wool" and two "lam(b)s" suspended, which affords a certain means of identifying their patterns, which may be obtained of all Decorators.*

EIGHTEEN GOLD, SILVER, AND BRONZE MEDALS.

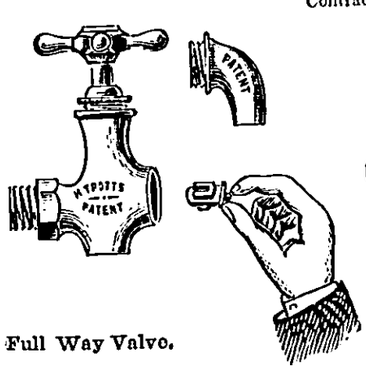
CERTIFICATES OF MERIT, SANITARY INSTITUTE, 1885, 1889.

H. TROTT'S
PATENT QUICK FILLING BIB & OTHER VALVES
FOR HIGH AND LOW PRESSURE WATER,

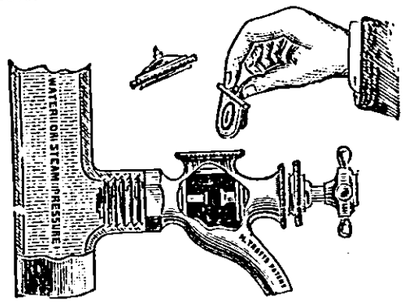
Approved by the New River and other Water Companies. 17,000 sold.

PATENTED IN ALL THE PRINCIPAL FOREIGN COUNTRIES.

Awarded Certificates of Merit for Bib Valves for Hot or Cold Water, by The Sanitary Institute.
Contractor to Her Majesty's Government.



Full Way Valve.



Showing Movable Valve whilst under Pressure

DESCRIPTION.

These Patent Valves are strongly made, and consist of a sliding or swinging valve in a chamber covered with a screwed cap or nozzle, the unscrewing of which facilitates the removal of the inner valve, and the insertion of new Asbestos or Metal Discs, when necessary, a work of the greatest simplicity and ease.

H. TROTT, Engineer, &c.,

73, 77, & 79, High Street, Battersea, LONDON, S.W.

CERTIFICATE OF MERIT, SANITARY INSTITUTE, 1889.

THE

"St. Bede Disinfectant."

(PATENTED. REGISTERED.)

A REAL DISINFECTANT!

Used by Medical Officers of Health.

TESTIMONIALS.

REPORT BY DR. EDWARD SEATON ON THE "ST. BEDE DISINFECTANT."
31st July, 1889.

Since it became established that the Per-Chloride of Mercury in the presence of a free acid, or its equivalent, was by far the most efficacious disinfectant, medical practitioners generally, and especially those who have to do with the prevention of fevers, have felt the great want of a convenient preparation which would contain the Per-Chloride of Mercury in the necessary strength together with a free acid, or its equivalent; and which would at the same time be in such a form as could be safely entrusted to Fever Nurses, Sanitary Inspectors and others by whom the processes of disinfection are usually carried out.

Such an article has now been prepared by the St. Bede Chemical Company. It is in the forms of blocks, each weighing an ounce, and each containing 17·5 grains, or 4 per cent. of Per-Chloride of Mercury. The block is composed mainly of anhydrous sodium sulphate (392·4 grains), with which is combined 24·5 grains of sulphuric acid; the acid sulphate thus formed appearing to act like a free acid, and to give to the Per-Chloride of Mercury its full disinfecting or germ-destroying power. The block contains also 2·2 grains of eucalyptus and thymol and ·9 grains of indigo, so that when dissolved it has a strong, but pleasant, smell and a bright blue colour. I have had several of these blocks submitted to me for analysis, experiment, and report. I find the proportion of the Per-Chloride of Mercury in each to be as stated, viz., 4 per cent., or 17 grains in the ounce block. The block is rather slowly soluble in a quart of water. The resulting blue solution is described as a very strong disinfectant. In order to test this I have made experiments in conjunction with Dr. Klein, to ascertain the effect of the solution on certain well known organisms which have been proved to be pathogenic or constantly present in zymotic diseases. The tests were made with the bacilli and spores of anthrax, also with the organisms present in cases of cholera and enteric fever. On adding three drops of the culture fluids of these organisms to three cubic centimetres of the blue solution, consisting of one block dissolved in a quart of water, the organisms were destroyed after only five minutes' exposure. This is a very severe test and shows that the blue solution is a very strong disinfectant for infected linen, blankets, &c. We further tested its power of disinfecting the evacuations of enteric fever and cholera. Sterilised fæcal matter in a fluid condition was inoculated with as much as one-seventh part of the culture fluid of the organisms present in enteric fever. To this mixture was added an equal quantity of the blue solution, and five minutes was found to be sufficient to destroy the organisms. I have also tested its antiseptic powers by dissolving blocks in putrescible fluids, and I found that one block dissolved in twenty-five quarts of a putrescible fluid, retarded decomposition five days; and that when dissolved in twelve and a half quarts, there was no sign of decomposition in the putrescible fluid after eight days. I further tested its power as a deodorant by noticing its effect upon heaps of fish refuse mixed with other decomposing animal and vegetable matters, and I found the solution was an excellent deodorant.

The preparation called the "St. Bede Disinfectant" has most powerful disinfecting and antiseptic properties, and is also a valuable deodorant. At the same time its colour and smell are quite sufficient safeguards against the possibility of its mistaken use. I have therefore no hesitation in strongly recommending it on public grounds.

(Signed) EDWARD SEATON, M.D., F.R.C.P.,
Fellow of the Institute of Chemistry.
Medical Officer of Health for Chelsea,
Lecturer on Sanitary Science and Public Health, St. Thomas' Hospital, London.

THE DETAILS OF THE EXPERIMENTS REFERRED TO IN DR. SEATON'S REPORT ARE AS FOLLOWS:—

The "St. Bede Disinfectant" was now in solution, one block being dissolved in one quart of water.

1.—The "killing power," i.e., the power to kill microbes, was tested on the following microbes: (A) bacillus anthracis without spores, (B) spores of bacillus anthracis, (C) the comma-bacillus found in Asiatic cholera, (D) the bacillus found in human typhoid fever.

Of normal cultivations in broth of these several microbes, about three drops were added to about three cubic centimetres of the disinfectant solution, well mixed, and after the lapse of five minutes, one to two drops of the mixture were added to tubes containing about 10 c.c. normal sterile beef broth; for control similar normal sterile beef broth was inoculated with a mere trace of the same culture fluids used for the above experiments. All broth tubes were placed in the incubator at 37° C., while all the control tubes showed already after twenty-four hours' copious typical growth of the several microbes, the others were perfectly clear and remained so afterwards. It follows from these experiments that five minutes' exposure of bacillus anthracis, of spores of bacillus anthracis, of the choleraic bacilli, and of the typhoid fever bacilli to the "St. Bede Disinfectant" solution is sufficient to kill these microbes.

2.—An important and extremely severe test of the killing power of the "St. Bede Disinfectant" solution was made in the following experiments:—

To normal human fæcal matter in thick solution, previously sterilised and contained in test tubes, was added a certain quantity of normal culture fluid of the choleraic bacilli and of the typhoid fever bacilli respectively, about one-seventh of the culture fluid being added to six-sevenths of the fæcal solution. After mixing well the disinfectant was added to each of the fæcal mixtures in equal proportions, so that each of the test tubes contained ½ of the fæcal matter plus culture fluid, and ½ of the disinfectant. After five minutes a number of test tubes containing sterile beef broth, as in the former series, were inoculated with a drop or two from these fæcal mixture tubes, then placed in the incubator and kept at 37° C., but no growth appeared in them and the fluids remained sterile. At the same time that the above experiments were made, control broth tubes were inoculated with a trace of the fæcal solution after the addition to them of the culture fluids, but before the addition of the disinfectant, these control tubes were also placed in the incubator and kept at 37° C., they all showed abundant normal growth after twenty-four hours of the choleraic bacilli and of the typhoid bacilli respectively.

(Signed) E. KLEIN, M.D., F.R.S.,
Professor of Bacteriology at the College of State Medicine, London.

LABORATORY AND ASSAY OFFICE,
75, THE SIDE, NEWCASTLE-UPON-TYNE,
July 6th, 1889.

I hereby certify that I have analysed a sample of the "St. Bede Disinfectant," manufactured by Messrs. The St. Bede Chemical Company (Limited), Newcastle-upon-Tyne, and that I find it contains as follows:—

Per-Chloride of Mercury	4·01 per cent.
Free Sulphuric Acid	4·10 "
Sulphate of Soda	87·25 "
Sulphate of Lime	1·30 "
Oxide of Iron, &c.	0·27 "
Chloride of Sodium	0·21 "
Insoluble Siliceous Matter	0·24 "
Thymol, Eucalyptus, Indigo, and Water	2·62 "
	100·00

The principal active ingredient of this disinfectant is Per-Chloride of Mercury (corrosive sublimate) which is known to be the most certain and powerful destroyer of disease germs. When the "St. Bede Disinfectant" is dissolved according to the instructions given it forms a solution of the strength and character recommended by Dr. Buchanan, the Medical Officer of the Local Government Board, as being effective as a disinfectant. It is prepared and packed in a form which makes it convenient and easy to be used.

(Signed) JOHN PATTINSON, F.I.C., F.C.S.
Public Analyst for Newcastle-upon-Tyne.

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NOW MANUFACTURED ONLY BY

The Hedworth Barium Company,

NEWCASTLE-UPON-TYNE.