Ventilation of Schools.

"Air is the prime supporter of life; health; even life itself is dependent upon its purity."—PARKES.

The efficient ventilation of schoolrooms where large numbers of children are congregated, for hours together, is of the very first importance. Healthy bodies make healthy minds, and children who pursue their studies in a pure atmosphere, free from draughts and not overheated, make much greater progress than children who are confined in badly ventilated, overheated, and draughty rooms.

The greatest care should be taken to prevent down-draughts in cold weather, such as proceed from the adjustable ventilators which are commonly fixed in the upper parts of the windows, and which permit a large body of cold air to blow directly into the class rooms and descend upon the heads of the children, cooling and returning the expired and vitiated air to be rebreathed. This is one of the most pernicious forms of ventilation that could be employed in cold weather, and is not only a source of discomfort to the children and the teachers but is a prolific cause of illness and disease.

When windows are utilised for the admission of air it should enter through protected openings at the lower parts and be deflected upwards. This will not only minimise draughts but will ensure more complete diffusion.

A still safer and more satisfactory method of admitting air in cold weather is the employment of air inlet brackets or tubes fixed round the walls at suitable distances from each other and fitted with regulating valves to control the supply. The velocity of the air should not exceed 2 ft. per second if draughts are to be avoided. Ventilating radiators placed in the window recesses not only heat the room but admit a plentiful supply of fresh air warmed to a healthy temperature.

Hot air should never be used for the purposes of ventilation which is also employed to heat the room, as air raised to a temperature such as is required to effectively heat a building is thereby greatly deteriorated, the oxygen being to a certain extent destroyed and the bracing and tonic qualities of the air reduced.

The authorities on the subject are unanimous in condemning this method of heating as undesirable and injurious to health. (See page 28.)

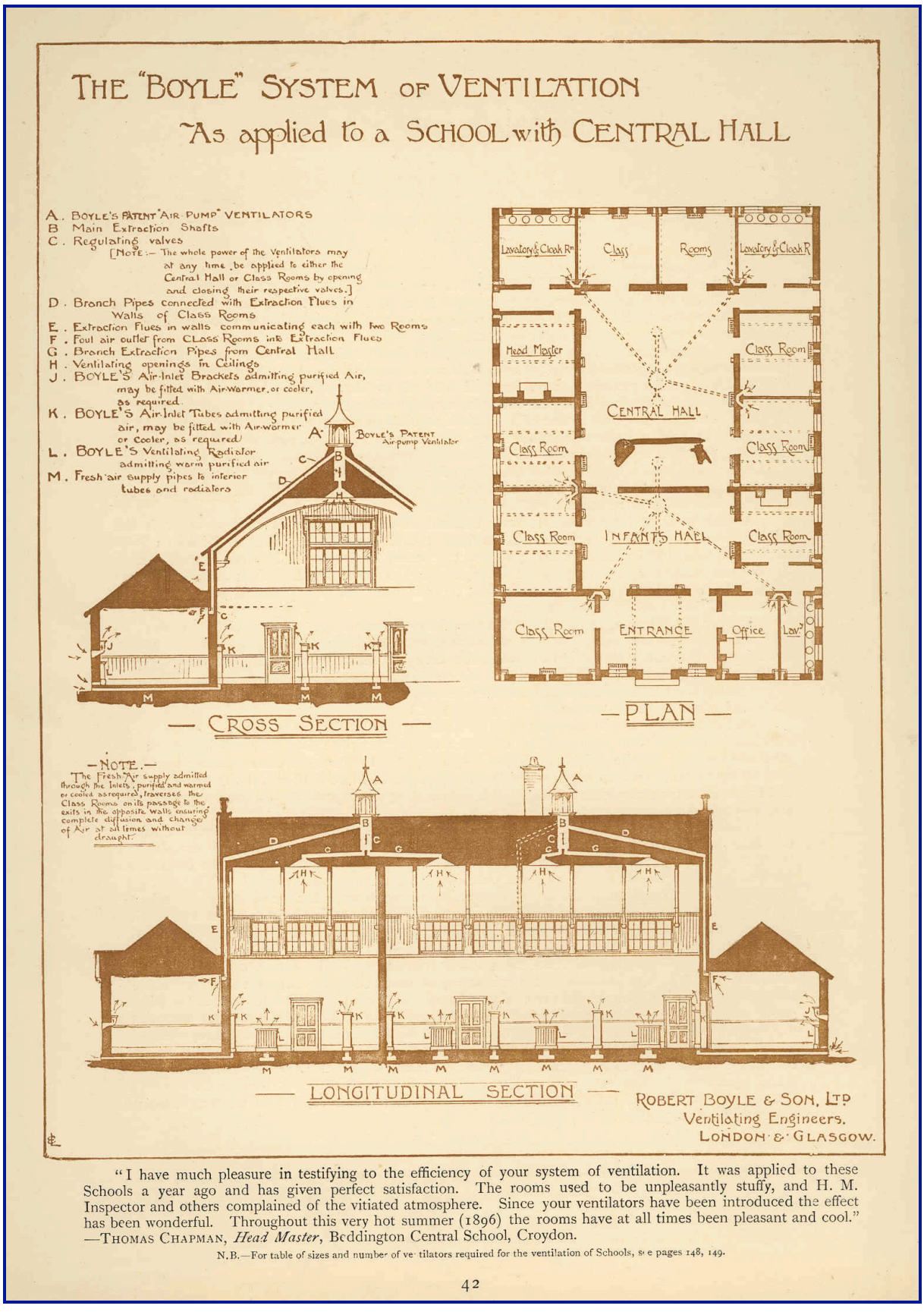
Radiant heat is the healthiest form of heating, as with it the walls can be more effectually warmed than with hot air, and the fresh air supply raised to a comfortable temperature without in the slightest degree injuring it. In warm weather window openings may safely be employed to supplement the ventilation, as there is then not the same danger from draughts as in the winter, when special ventilating arrangements are most required and are, indeed, an absolute necessity.

When the temperature of the air in a class room is 60° to 65° F., the air is expelled from the lungs at a temperature of from 85° to 90° F., and, along with the heated exhalations from the body, ascends with considerable velocity to the upper parts of the room from whence it should be drawn off and not permitted to return to be reinhaled.

The extraction should therefore always be from above, which can easily be effected by the utilisation of the natural forces which are always at work, through the never-ceasing movement which exists in the atmosphere, and without the aid of costly mechanical appliances, which are quite unnecessary and which have not been found in actual practice to be so efficient or reliable as natural ventilation when properly applied. Great care should, however, be taken in the selection of ventilators, as much depends upon their correct construction. The most dangerous form of ventilation is where the air is admitted at the higher parts of the room and forced downwards by mechanical propulsion, as the ascending vitiated air is thereby returned—in opposition to the laws of nature which govern ventilation—to be reinhaled along with the products of combustion and other deleterious matter contained in the air. A high authority justly describes this method of ventilation as "a standing menace to the health of society." When fans are employed for the extraction of the foul air intolerable draughts are set up: they are, therefore, not to be recommended. (See pages 24, 25, 46.)

Ventilation of Schools, c.1900 [BSV, p.41]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS



"I have much pleasure in testifying to the efficiency of your system of ventilation. It was applied to these Schools a year ago and has given perfect satisfaction. The rooms used to be unpleasantly stuffy, and H. M. Inspector and others complained of the vitiated atmosphere. Since your ventilators have been introduced the effect has been wonderful. Throughout this very hot summer (1896) the rooms have at all times been pleasant and cool."
—THOMAS CHAPMAN, *Head Master*, Beddington Central School, Croydon.

N.B.—For table of sizes and number of ventilators required for the ventilation of Schools, see pages 148, 149.

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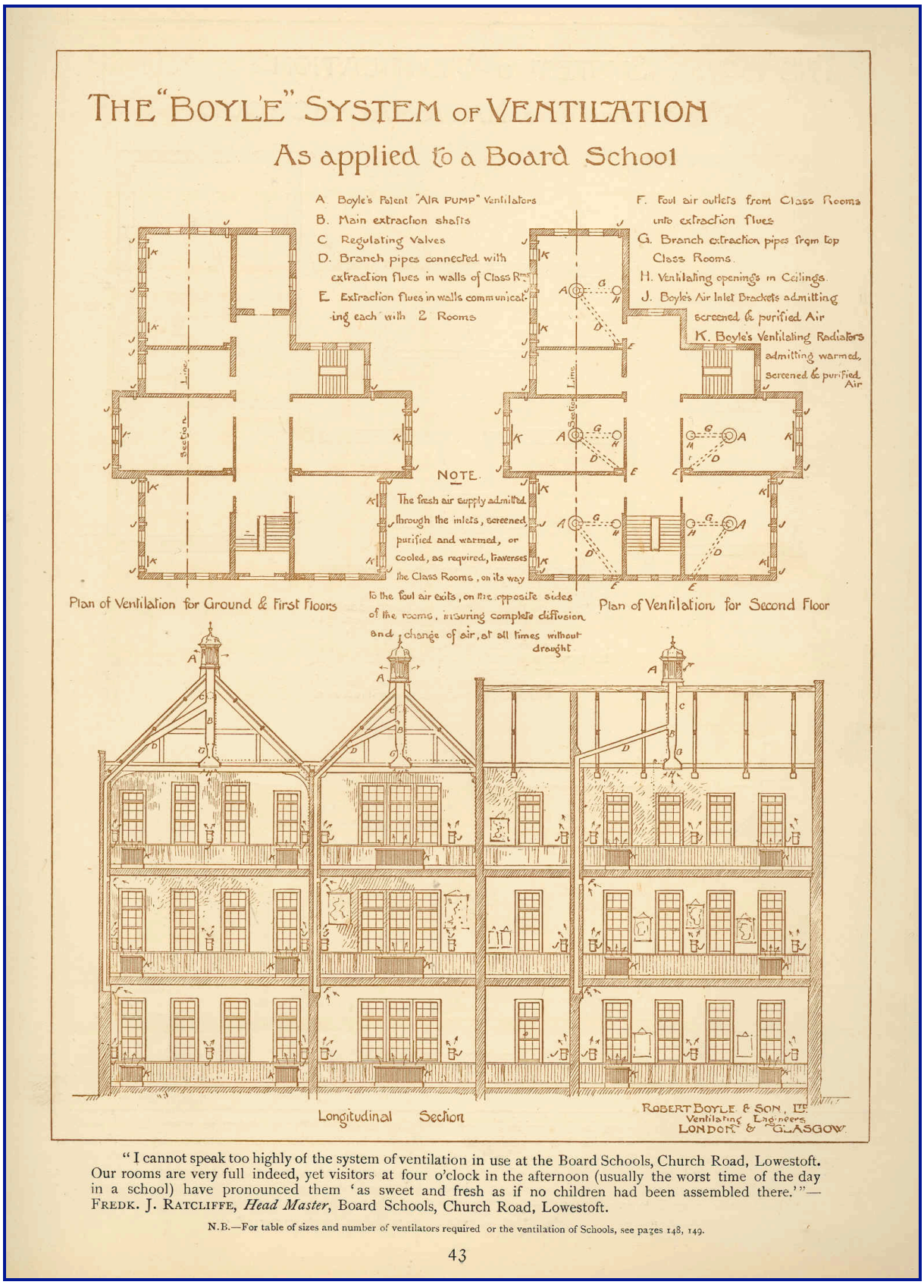
Beddington School, Croydon, 1896 [BSV, p.42]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS



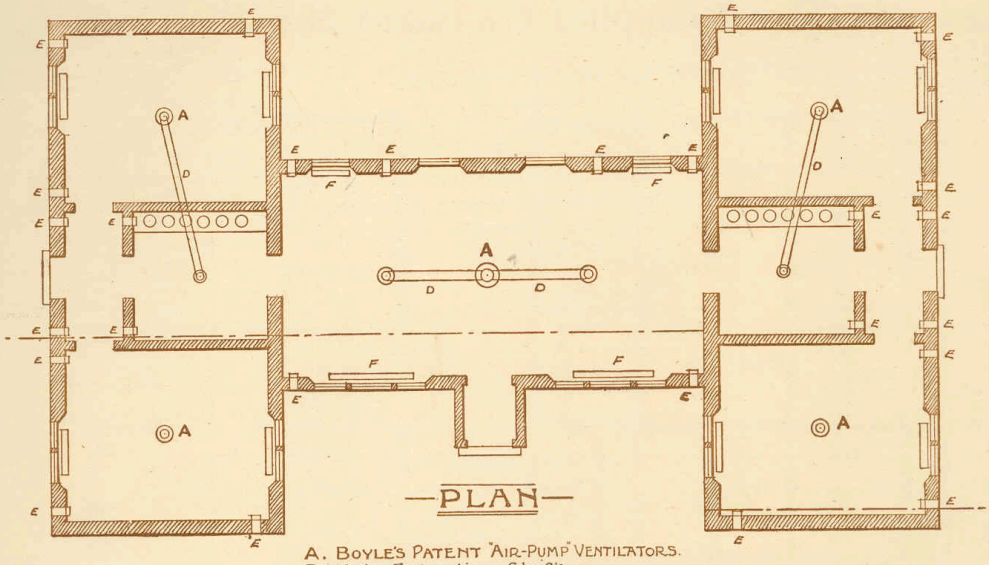
"I cannot speak too highly of the system of ventilation in use at the Board Schools, Church Road, Lowestoft. Our rooms are very full indeed, yet visitors at four o'clock in the afternoon (usually the worst time of the day in a school) have pronounced them 'as sweet and fresh as if no children had been assembled there.'"—FREDK. J. RATCLIFFE, *Head Master*, Board Schools, Church Road, Lowestoft.

N.B.—For table of sizes and number of ventilators required or the ventilation of Schools, see pages 148, 149.

Board School, Church Road, Lowestoft, c.1900 [BSV, p.43]

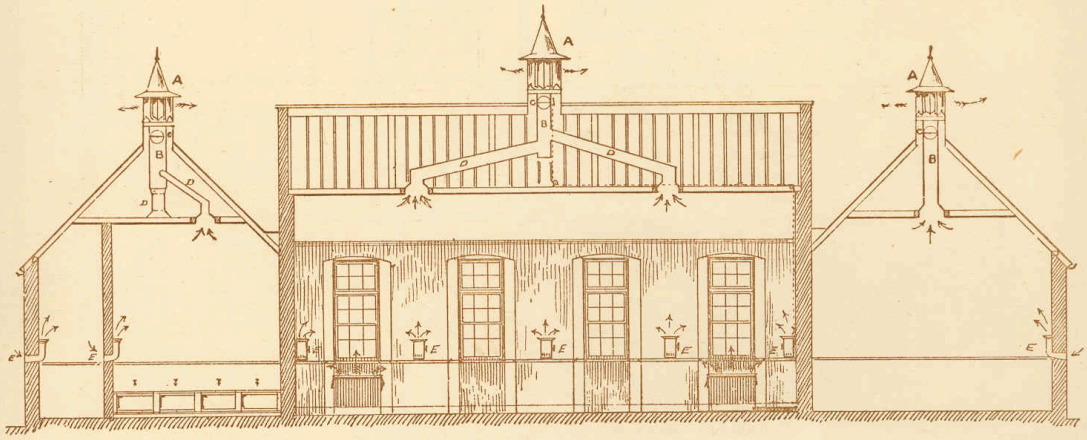
WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS

THE "BOYLE" SYSTEM OF VENTILATION
As applied to a NATIONAL SCHOOL.



—PLAN—

A. BOYLE'S PATENT "AIR-PUMP" VENTILATORS.
B. Main Extraction Shafts.
C. Regulating Valves.
D. Branch Extraction Shafts connected with Cone over Ventilating openings in ceiling covered on face with perforated panels.
E. BOYLE'S Air-Inlet Brackets fitted with Air Screens.
F. BOYLE'S Ventilating Radiators for admitting warmed, screened & purified air.



— LONGITUDINAL SECTION —

ROBERT BOYLE & SON, LTD
Ventilating Engineers,
LONDON & GLASGOW.

"Some years ago this School was in a very insanitary condition, owing chiefly to defective ventilation. Various methods were tried to remedy the evil, with but partial success. Having, however, been recommended by a F.R.I.B.A. to give your 'Patent "Air-Pump" Ventilators' a trial, we had three placed on the roof, and there was an immediate change for the better. I am glad to say that this state of things has been maintained, and the School, instead of being one of the worst ventilated in the district, now ranks amongst the best. It seems little short of marvellous that so great a change should have been made by so little expenditure."—J. B. BAILEY, *Head Master*, National Schools, Maryport.

N.B.—For table of sizes and number of ventilators required for the ventilation of Schools, see pages 148, 149.

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National School, Maryport, c.1900 [BSV, p.44]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS

REPORTS ON

The "Boyle" System of Ventilation

AS APPLIED TO SCHOOLS.

The "Boyle" System of Ventilation has been successfully applied to over 7,000 Schools.

DANIEL MACANDREW, ESQ.,

Architect, Aberdeen University.

"Your system of Ventilation has been applied to nine of the most crowded Class Rooms in Aberdeen University, with great relief to Professors and Students."

M. S. FORSTER, ESQ.,

Bursar, Wellington College, Berks.

"I am glad to inform you that the Ventilators placed in four of the large dormitories at Wellington College have proved quite satisfactory, and that we propose to place similar ventilators in four other dormitories."

ARTHUR MOORE, ESQ.,

Head Master, Board School, Stifford, Grays.

"Your system of Patent 'Air-Pump' Ventilators was adopted in the erection of the new Schools at Stifford, Grays, and after the test to which they have been put during this excessively hot season (1896) I have no hesitation whatever in pronouncing them perfectly adapted to Schools. On one occasion in particular, on a very hot day when a surprise visit was paid the School by a member of the Board (the Rev. H. H. Allott, M.A., Stifford Rectory), this gentleman was so struck with the coolness of the school atmosphere that a note on the good ventilation was forthwith recorded by him in my Log Book.

REV. J. DUGGAN, Maidstone.

"When my School was built, inlets for fresh air were provided and outlets too; but the outlets, being mere openings, did not act. At the end of an attendance of two hours, the air of the Schoolroom often appeared positively poisonous to anyone who went in from the open air. Your 'Air-Pump' Ventilator was put up several weeks ago, and now the air of the Schoolroom appears to be always nearly as pure as the outside air. There are no down-draughts or draughts of any kind. The improvement is very remarkable, especially when one considers the simplicity of the Ventilator, which is in action day and night without noise, without getting out of order, and without requiring attention."

R. W. B. MOORE, ESQ.,

Vicar, Kingsgrove Vicarage, Stoke-on-Trent.

"Your Ventilating appliances in the Kingsgrove Church Schools are completely satisfactory. Even when the rooms are used for crowded meetings or entertainments, the Ventilation now seems perfect."

ARTHUR FOX,

Head Master, Bardsea School, Ulverston.

"I am glad to say that the 'Air-Pump' Ventilators supplied by you for this School a year ago are quite satisfactory. Our corresponding manager has remarked several times on the pureness of the air since they have been in use. Not the slightest down-draught was felt throughout last winter."

E. SCHOFIELD, ESQ.,

Head Master, Duckworth Street Schools, Darwen.

"Perhaps the best testimonial I could give to your Self-Acting 'Air-Pump' Ventilator which has been applied to these new Schools, would be to relate an incident which lately occurred. A gentleman, member of a neighbouring School Board, paid a visit in the middle of a warm afternoon this June. He remarked, 'How cool and fresh the air is! There is none of that close, hot foul air, and bad smell which one always finds on entering a Schoolroom.' I have only to add that I believe your system as near perfect as it can be."

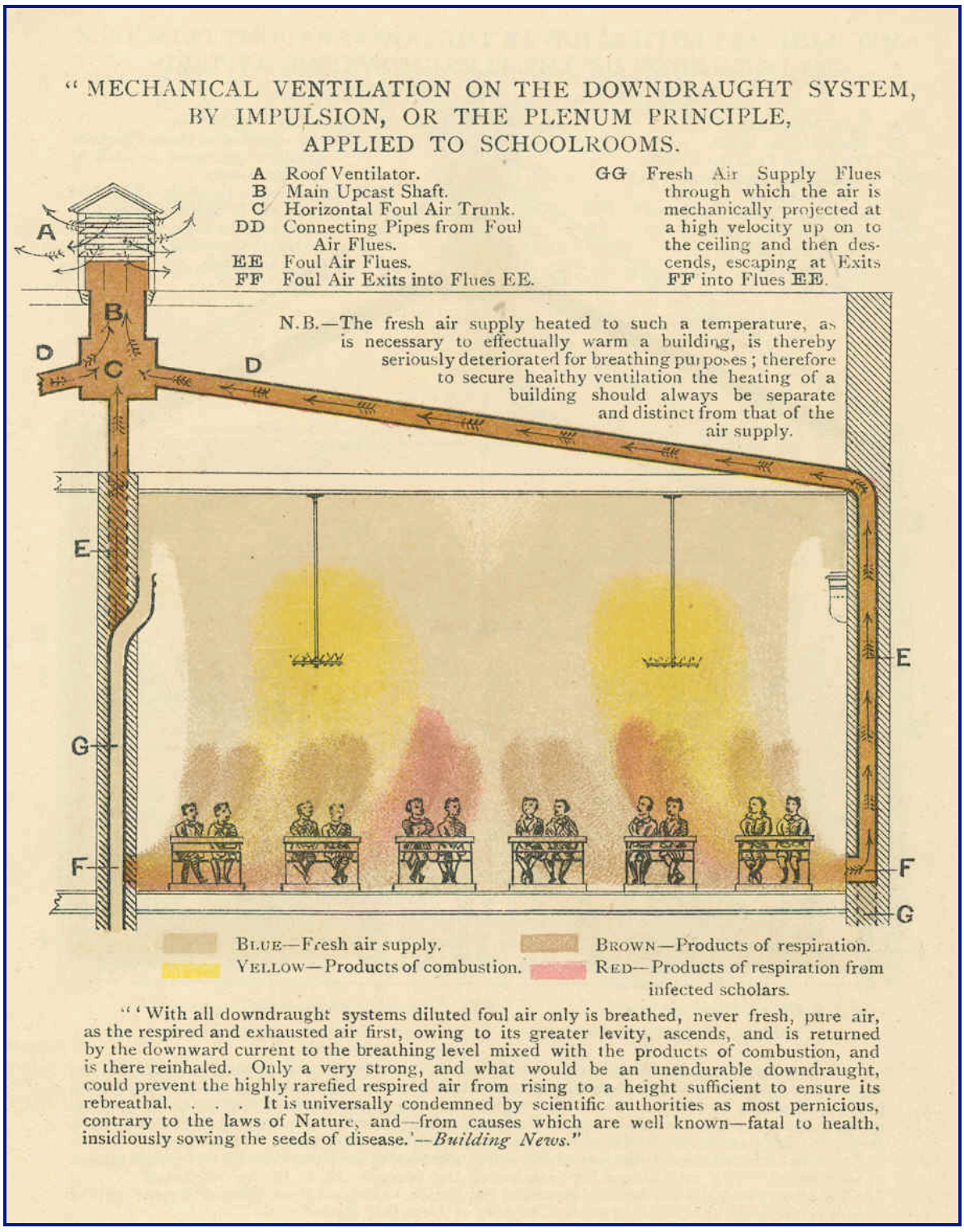
PHILIP N. PEAKE, ESQ.,

Head Master, Park Street Board School, Wellingboro'.

"I am happy to say they give the greatest possible satisfaction. Though I have had charge of many Schools both in Lancashire and Yorkshire, until now I have never enjoyed the luxury of working in any School in which so perfect a system of ventilation has been carried out."

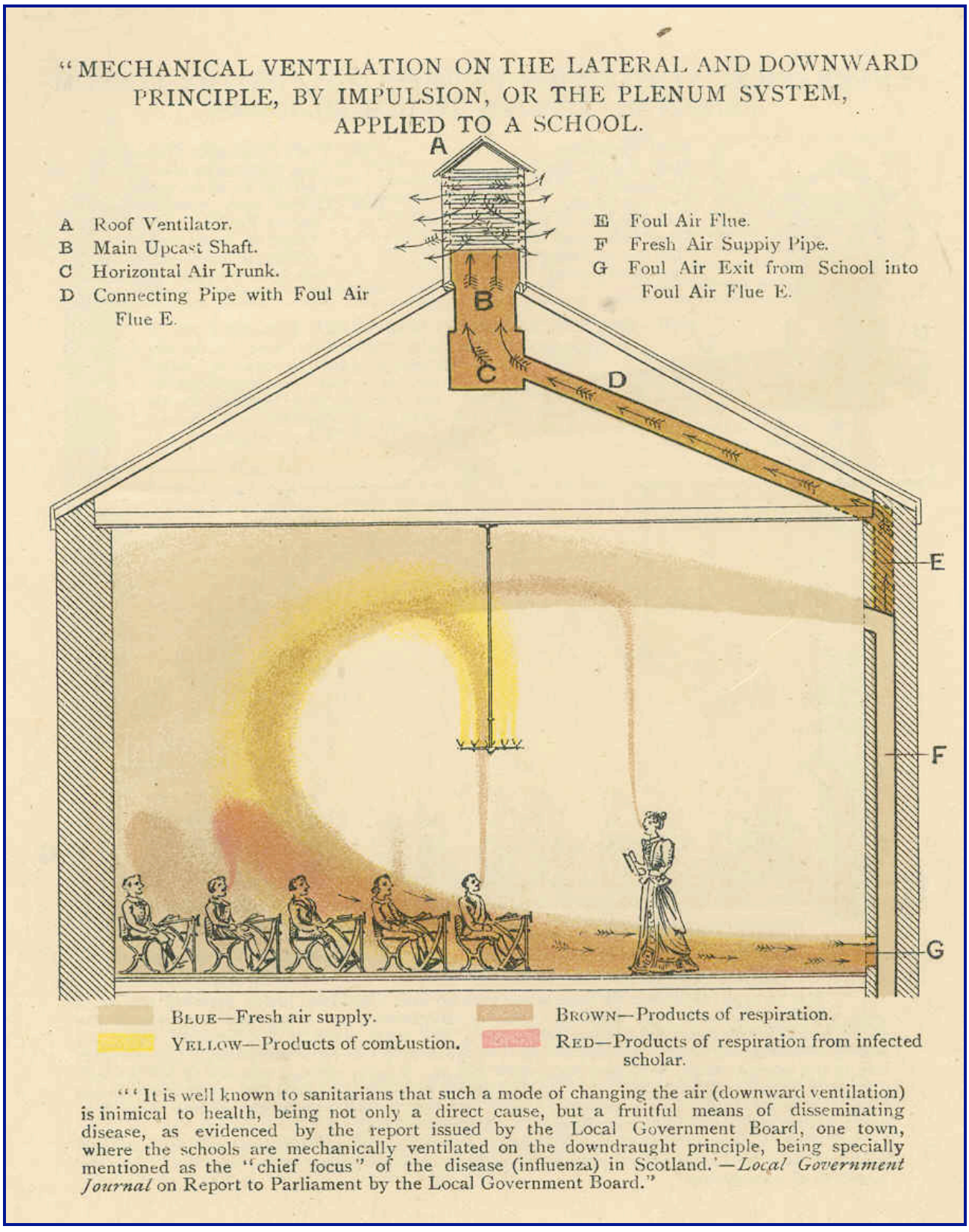
Testimonials, c.1900 [BSV, p.45]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS



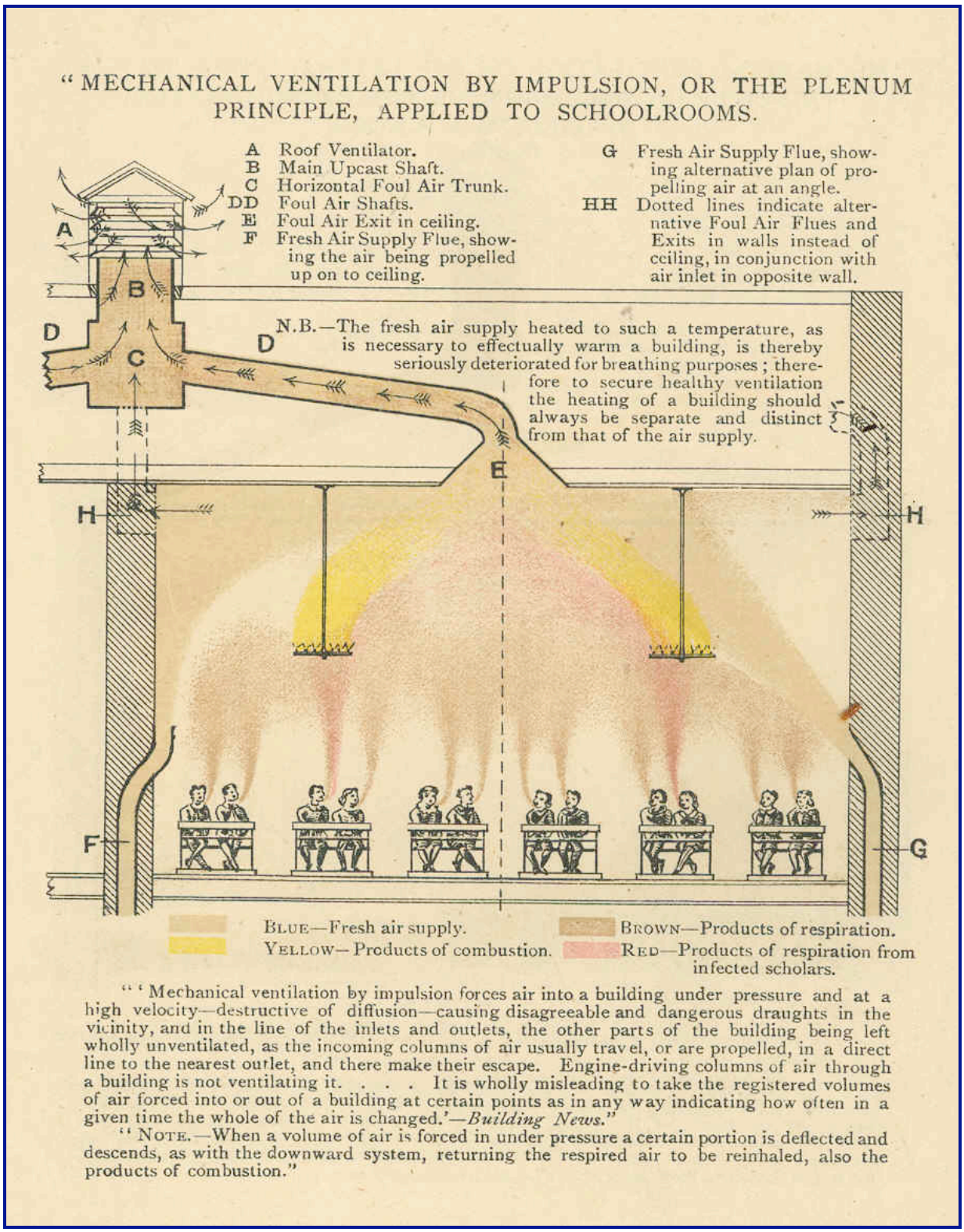
Mechanical extract ventilation, 1894 [BSV, supplement, diagram iv]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS



Mechanical extract ventilation, 1894 [BSV, supplement, diagram v]

WARMING & VENTILATING OF VICTORIAN & EDWARDIAN SCHOOLS



Mechanical extract ventilation, 1894 [BSV, supplement, diagram vi]