

Manchester
Aug 5th 1896.

Gent/ I send you the only copy of
Langfield Book I have, and must
try and get another one -
The Man^r. Corporation Free Libraries
Committee have tried this App^t, and
don't like it - Langfield tried hard to
get them to put it in the Cheetham
Library, and take ours out, but after
consideration gave us the order for
renewal -

I was at Cheadle (W. Man^r.) Wesleyan
Chapel yesterday, where our App^t is
done after 31 years service, and they
have been enquiring about Langfield's,
but the reports are so unfavourable
that they won't entertain it - I am
sending in report and tender for renewal.

W. Waterhouse is trying it at some
large extension of the Liverpool College.
He told me he had tried it in the South
and it answered well -

Yrs obed^t servant
J. Sutcliffe

By Royal  Letters Patent.

LANGFIELD'S

PATENT AUTOMATIC

"MOIST AIR"

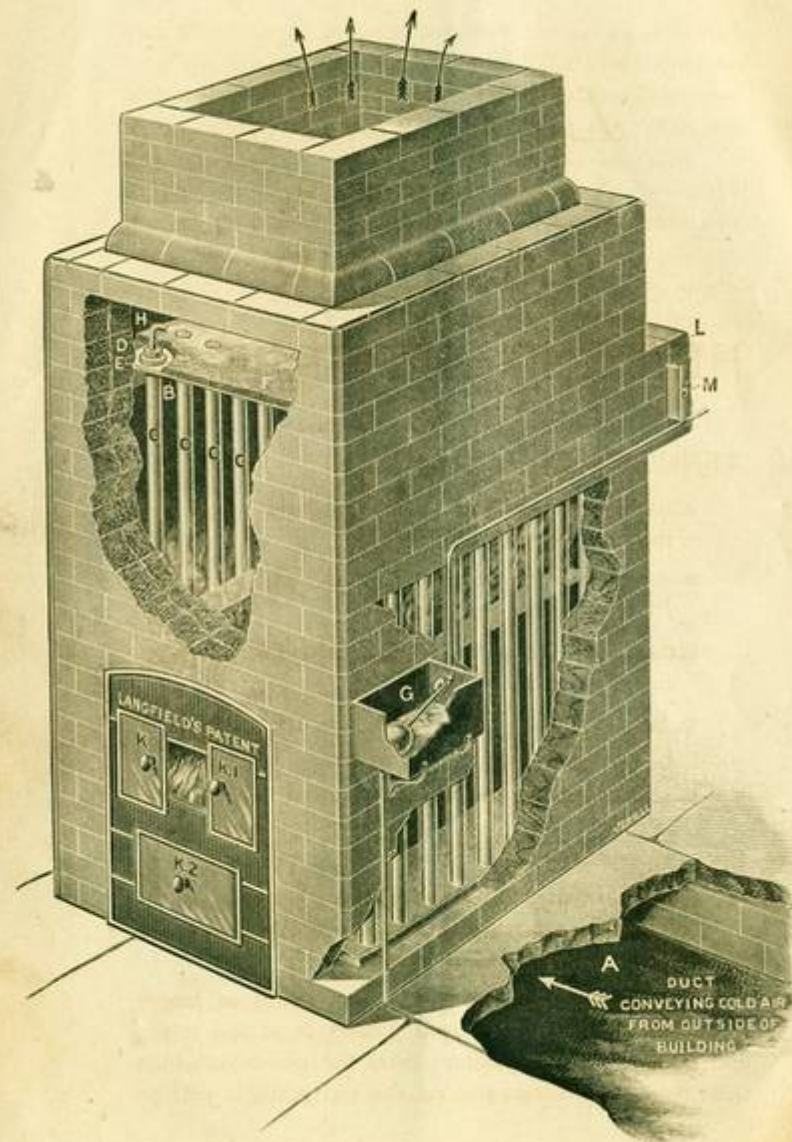
HEATING & VENTILATING

APPARATUS.

Advantages:

Moderate Price.
Saving of 50% in Fuel.
Minimum of attention requisite.
Pure, Moist, Warm Air.
Gentle and Perfect Circulation and Ventilation.
Rapidity of Heating.
Automatic Self-regulating Action.
No Power needed.
Perfect freedom from danger.
Anyone can work it.

J. LANGFIELD & CO.,
10, COLLEGE LAND, ST. MARY'S STREET, DEANS GATE,
MANCHESTER.



Langfield's PATENT **MOIST AIR** **HEATING APPARATUS.**

In the accompanying engraving:—

- A.** is a Cold Air Duct, connecting the stove with the exterior of the Building.
- B.b.** represent, respectively, "Top" and "Bottom" Plates of Wrought Iron.
- C.C.C.C.** are Wrought Iron Lapwelded Tubes passing through **B.b.**
- D.** is a Wrought Iron Collar, which is fastened on each Tube.
- E.** is an Asbestos Washer, fitted under each Wrought Iron Collar for the purpose of making a perfectly "tight" joint.
- F.F.** represent sand, which is placed around all the joints as a further precaution against the possibility of an imperfect joint.

The tube-holes in the plates **B.b.** being of larger dimensions than the external diameters of the tubes, and the latter being pendant from the points at which their respective collars rest on the top plate, it will be

square foot, or in other words the air is coming in at the rate of 500 cubic feet per minute, or 30,000 cubic feet per hour. By enlarging the inlet opening to 2 square feet, and the Apparatus proportionately, we would obtain 60,000 cubic feet, a quantity sufficient to

**RENEW THE ENTIRE CONTENTS TWICE
PER HOUR,**

of a house containing hall, dining, drawing, and morning rooms, four bedrooms, bathroom, &c., and kitchen.

It will, therefore, be seen that we not only do not burn the air, but also that such is the construction of our stove that

**NO FANS ARE REQUIRED TO PROPEL
THE AIR,**

for, as proportionately to the size of the room or building, is the number of the tubes in the Apparatus, it will readily be seen that the latter can be very easily adapted for large or small areas, and further, that the number of times the air is required to be renewed, per hour, determines the size of the stove.

We now come to

THE MOISTENING PROCESS,

which is effected by means of the tank, &c., described on page 2.

The cistern, regulated by the ball tap, keeps the supply of water at a uniform height, and a corresponding level is consequently maintained in the "steamer" **H**, which, as shown, after passing through the interior of one of the tubes, bends over at the top into the hot air chamber.

The action of moistening is entirely automatic, for as the heat of the air increases, the temperature of the

water is raised, and, as the area of the "steamer" **H** is proportionate to the volume of warm air, the evaporation which takes place is just sufficient to **counteract** the unpleasant dryness and irritating harshness so often an objection in warm air. For

HOT HOUSES, CONSERVATORIES, &c.,

where a great deal of moisture is required, the number and size of the "steamers" **H**. are increased. The same remarks apply to

TURKISH BATHS.

In addition to its moistening functions, however, the cistern forms an excellent medium for

DISINFECTING;

as any soluble disinfecting powder, introduced to the water in the tank, is speedily vaporised and carried with the hot air into the building, in every corner of which traces can, in a very short time, be detected.

In a similar manner may be treated essences, such as essence of pine, and eucalyptus oil, or other liquids of a kindred nature, which are recommended by the medical faculty for inhaling in cases of bronchial affections, or as antiseptic in times of an epidemic, such as "Russian influenza."

As regards cost of maintenance, we claim a **SAVING OF 50 PER CENT. IN FUEL (COKE)**, as compared with any other stove of equal capacity, while the stoking only

REQUIRES ATTENTION TWICE PER DAY.

We can readily satisfy the **INSURANCE COMPANIES** that there is absolutely

NO DANGER FROM BURSTS, EXPLOSIONS, OR FIRES,

as, in the first case, there are no pipes charged with water or steam, with the exception of the steamer, and in connection with which it would be impossible to get any pressure, as both ends are open.

Consequently, severe frosts and the frequent sudden changes of temperature, which often follow, do not affect our Apparatus, which in all weathers we guarantee to

MAINTAIN A UNIFORM TEMPERATURE OF 60° FAHRT.

As regards the durability of the Apparatus, there is practically no limit, if any ordinary amount of care be exercised, as everything used in construction is of the very best quality and workmanship, while a glance at the drawing will show there is nothing to get out of order. What few joints there are, are so constructed as to prevent the slightest possibility of sulphur or other noxious gases—generated in the combustion chamber—ever coming in contact with the warm air to be breathed.

From the top of the Apparatus the moist, warm air is conveyed either through flues (brick or sheet-iron, covered over to retain the heat) carried over the heating chamber ceiling, or, in addition, through cavity flues in the wall terminating in the floor levels generally, in gratings, fitted with an open and shut valve, which can be regulated by the hand or foot to remain in any desired position, the surfaces of which are of lattice pattern, and finished in "Majolica," though, in many instances, we have, at the special request of our clients, supplied, at an increased cost, "brass" or "bronzed" gratings.

Occasionally we supply shafts or tobins, to any design, and fitted with a regulator valve, which will deliver the air at a height of, say, 6ft. from the ground.

In addition to heating, we have adapted this stove for the destruction of all the germs of disease in

FEVER AND OTHER INFECTIOUS HOSPITALS,
in connection with which we draw all the air out, and pass through the Apparatus before emitting to the outside air, thus reducing the liability of infection to the surrounding neighbourhood to a minimum.

Our system is also specially applied to the

DRYING OF HOPS, WOOL, TIMBER, POTTERY, &c.,

and here again, compared with existing methods, we claim a distinct economy both as regards cost of fuel and maintenance, and also with respect to first cost and attention, both of which are reduced to a minimum, owing to our not requiring fans, nor any equivalent mechanical appliance, while as the construction of the Apparatus is so simple and contains nothing which can, with any ordinary care, get out of order, there is no prospect of loss of time or money owing to breakdowns in the machinery. For the benefit of those more directly interested in Wool Drying we may say we have embodied in a separate circular full details of our system, with Drawings setting out our scheme, which is such that no alterations require to be made to the existing Fellmonger's stove. On application we shall be happy to submit these particulars, with all information regarding Insurance, cost per pack for Drying, &c., &c., with references.

VENTILATION.

We now come to the all-important question of ventilation, without which satisfactory heating cannot be effected.

Unless adequate provision be made for its exit, no method, mechanical or other, would induce hot air to enter—much less diffuse over—a room, while to provide outlets near the ceilings, we maintain, is worse than useless, for the cold air outside the building, being by reason of its temperature more dense, not only acts as a barrier, preventing the outflow of the internal air, but owing to its pressure rushes into the building through what were intended for extracts, and falls like cold water on the luckless heads of those congregated inside.

Then, again, suppose we had no barrier to its exit. "Top" ventilation is, we assert, the wrong principle, for the purer the gas and greater the temperature the higher it will rise, and we should thus allow to escape what we were most in need of, while we retained the vitiated atmosphere.

We, therefore, submit that the proper manner in which to ventilate a room is by means of a grating, fixed at the floor level and connected to a cavity flue terminating above the ridge of the roof.

With such provisions we obtain the following results:—

The warm air entering the room, either at the floor level or from the side of the wall, as the case may be, immediately rises to the highest point, at which it commences to diffuse over the entire surface, and descending as it cools, or is displaced, absorbs the vitiated gases and falls eventually to the ground, from which it is drawn away through the extract grating and carried up the cavity flue to the outside of the building.



Consequently a perfect circulation, without a draught, is established, and may be effected as many times during an hour as may be desired, by simply increasing the size of the Apparatus, thus obtaining a greater velocity. **This we guarantee.**

This, then, is our system, which may be summed up as follows:—

A method of heating and ventilating buildings by drawing in fresh cold air, warming and moistening same, and sending it in—without any mechanical appliance—in sufficient quantities to renew the entire contents, at least twice per hour, or as often as may be required, without draughts, at an economy as regards maintenance and fuel equal to 50 per cent. in comparison with other methods, while

- (a) No pipes are required around the rooms.
- (b) There are no bursts from pressure, nor frosts, nor leaky joints.
- (c) There is absolutely no danger from fire nor explosions.
- (d) The fire only requires attention twice per day.

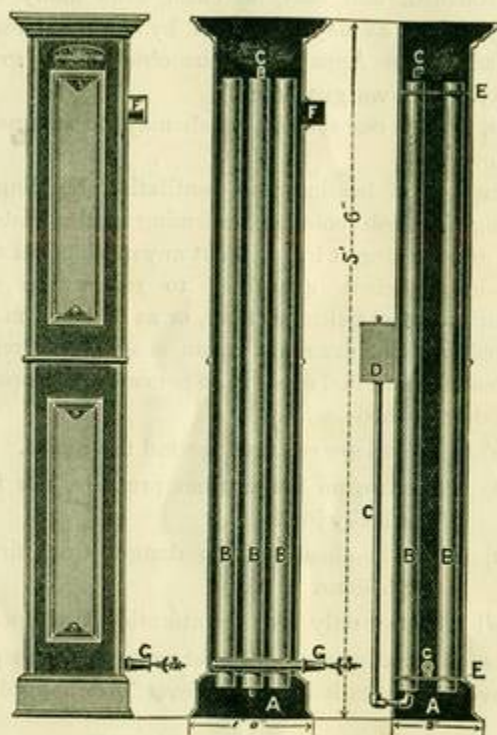
Where specially required, as for example in Hospitals, we have an adaptation of our "Fever" patent applicable for

SUMMER VENTILATION.

where, by an arrangement of dampers, the currents are reversed, the air being drawn back from the rooms to the bottom of the Apparatus and sent to waste through an upright shaft, which terminates on a level with the ridge of roof in a flat top, but having the four sides fitted with louvres.

This, of course, necessitates a few extra requirements, particulars of which we shall be happy to supply on receipt of enquiry.

GAS STOVE.



DESCRIPTION.

A. Fresh Air Inlet. This can be modified in various ways to suit requirements of our clients. For example, by cutting a hole in the flooring boards immediately underneath the stove (say 3in. by 4in.), and connecting a sheet-iron stove pipe from the outside wall of building, a direct supply of fresh air is drawn from the exterior of the building. In many instances, however, the cavity under the flooring boards is opened to the outside atmosphere by means of small ventilating grids, in which case it is only necessary to cut the hole in the floor, dispensing with the iron stove pipe, and in this way by keeping up a circulation under the floors "dry rot" is counteracted.

In places where neither of the foregoing are practicable, as for instance in a hall where the floor is tiled, we drill air holes around the base of the stove, and draw from the room.

B. Wrought-iron Lap-welded Boiler Tubes.

C. Iron pipe containing water for moistening process.

D. Galvanized Iron Tank retaining water supply.

EE. Wrought-iron Plates into which the tubes are fixed at the top and bottom of the stove, forming with the four sides the heating chamber.

F. Escape for Gas Fumes. This may be connected to a chimney flue, or may be passed through the wall to the outside of the building, and fitted with a small (say 2in.) ventilator.

G. Bunsen Burner, requiring $\frac{1}{4}$ in. bore gas supply.

In ordering, please state on which sides **F G** are required, and how **A** is to be.

Constructed on precisely similar lines to our "Coke" Heating Apparatus, with the exception that the heat is generated by a "Bunsen" Gas Burner, instead of a coke fire, we supply this gas stove, capable of delivering fresh moist warm air, twice per hour to one or two rooms, such as offices, &c., in which it will maintain a temperature of 60° Fahr. when frost is on the ground. Where the gas rate is 2s. 4d. per 1,000 cubic feet, the cost of warming an ordinary sitting-room, measuring, say, 14ft. by 12ft. by 9ft. high (about 1,500 cubic feet), would be sevenpence per week of 50 hours.

We will guarantee that there is not the slightest trace of gas to be detected, the fumes being drawn off at the top of the Apparatus and carried into an adjacent fire flue, through a small duct specially provided for the purpose, or through the wall to the outside atmosphere. This stove is so constructed as to occupy a space 12in. by 9in. by 5ft. 6in. high, and consequently fits in a chimney corner.

In summer it acts similarly to an ordinary "Tobin" cold air inlet, while in winter it warms and moistens the fresh air which is drawn through.

It can be adapted to almost any position, either inside or outside of a room, in a corner, or instead of a fire-place, which may be dispensed with. It is more economical than other stoves, gives off no fumes what-

ever, renews the air twice per hour, moistens the air, is not injurious to plants, occupies very little space, can be used as a disinfectant in a similar manner to the coke stove, acts as a cold air inlet in summer, and in building a new house would save the cost of grates.

We append a few names of Architects for whom we have had the pleasure of executing orders:—

G. F. Armitage, Esq., Stamford. 1 order.
 John Brooke, Esq., A.R.I.B.A., Manchester. 7 orders.
 S. Bull, Esq., County Borough Surveyor, Chester. 3 orders.
 O. C. Hill, Esq., Manchester. 2 orders.
 Henry Lord, Esq., F.R.I.B.A., Manchester. 1 order.*
 Messrs. Salomons & Steinthal, Manchester. 2 orders.
 J. G. Sankey, Esq., M.A., Manchester. 3 orders.
 A. Waterhouse, Esq., R.A., London. 2 orders.
 Messrs. Woodhouse & Willoughby, F.s. R.I.B.A., Manchester. 2 orders.*

And, amongst others, for the following gentlemen:—

Gustav Behrens, Esq., Holly Royd, Manchester.
 Rev. J. Clark, 1, Albion Place, Crescent, Salford.
 J. Fletcher, Esq., J.P., Ashton-under-Lyne (G. P. Office).
 W. H. Hemmant, Esq., Bulimba, Sevenoaks.
 G. Henderson, Esq., Heverswood, Brasted.
 G. H. Kenworthy, Esq., Hurst Hall, Ashton-under-Lyne.
 Alfred Tongue, Esq., F.C.A., Ash Lea, Seedley, Manchester.
 J. D. Waterhouse, Esq., Ashton-under-Lyne (A. S. H. and Glossop Bank).
 Rev. Canon Webb, M.A., St. Paul's, Crewe (Lecture Room).
 F. Webb, Esq., Loco. Supt., L. & N. W. Ry. Co., Crewe.
 Oldham Technical School.
 Oldham Mutual Technical School.
 Albion Schools, Ashton-under-Lyne, (1,200 scholars).
 &c., &c.

* Buildings in course of erection, November, 1894.

The Vicar of St. Chrysostom's Church, Victoria Park, in an article in his Parish Magazine for April, 1890, says:—

"We are glad to announce, as the congregation will no doubt have perceived, a decided improvement has been effected in the temperature of St. Chrysostom's Church,—a new heating apparatus has been fixed and works *most satisfactorily*. It is capable of raising the temperature to 65 or even 70 degrees, as was proved on a recent Sunday evening. It is known as the Patent Moist Air Heating Apparatus, and in addition to possessing the advantages of filling the Church with air sufficiently warm to render the atmosphere agreeable, it has another advantage in that the heated air before passing into the Church meets a jet of steam by which it is moistened."—*See Testimonial.*

FULWELL, TYLDESLEY,
 April 26th, 1892.

Mr. J. Langfield.

Dear Sir,—I have had your heating apparatus applied in my house for the last eight months, and during last winter have had a good trial of it. I am glad to say it has kept the house comfortable and warm during the coldest weather and that I am quite satisfied with its efficiency.

Yours faithfully,

(Signed) CHAS. ECKERSLEY.

OLDHAM INFIRMARY.

At the Quarterly Meeting of the Board of Governors of the Oldham Infirmary held April 22nd, 1892, the Secretary (Mr. Alexander Ure) in reading his report said,—“During the Quarter the south wards have been heated by Messrs. Langfield, on the Moist Air principle. The results at present are deemed very satisfactory, and should they continue to prove so the same treatment will be applied to the north wards before the next winter.”—*See Testimonial.*

OLDHAM INFIRMARY,
 April 22nd, 1892.

To Mr. J. Langfield.

Dear Sir,—The Patent Moist Air Heating Apparatus which you erected in the south wing (or at women and children's end) and the Lees Annex of our Infirmary during the last severe Winter, has so far given every satisfaction. The surgeons and nurses speak of it in the highest terms, and, seeing that it not only warms the rooms, but, unlike most other systems of heating, it also displaces the existing vitiated air and renews it with fresh warm air of the proper temperature about every hour, night and day; it seems pre-eminently adapted for hospitals and public institutions where large numbers of people, especially the sick and ailing are aggregated together. If it continues to give the same satisfaction, there is every probability that we shall shortly apply a second one to heat and ventilate the north wing or men's ward.*

On behalf of the Committee of Governors,
 I am, Gentlemen, yours faithfully,

(Signed) ALEXANDER URE, Hon. Sec.

* Second order completed October, 1892.

53, PRINCESS STREET, MANCHESTER,

March 17th, 1890.

Mr. J. Langfield.

Dear Sir,—With reference to the Heating Apparatus which you have put under St. Chrysostom's Church, Victoria Park, which is by a system of tubes, it is working satisfactorily and economically. The Church accommodates 600 people and is difficult to warm. The warm, moist air supplied by your system is pleasant, and comes into the Church in a manner which does not cause any draughts.

Yours truly,

GEO. WM. FOX,

Churchwarden.

Note.—This Church, 125 feet long, 45 feet wide, 50 feet high, with vestry and surplice room included, contains 260,000 cubic feet of air space, and is heated throughout from one grid. The system formerly employed required ten grids.

COLLIERY SCHOOLS,

ABRAM, near WIGAN,

April 26th, 1890.

Dear Sir,—I have great pleasure in stating that the "Langfield" Heating Apparatus you supplied and fixed at these Schools, has given entire satisfaction. It works economically, requiring very little attention, and keeps up an equal temperature in each of the several rooms heated, which with their sizes are as follows:—

Principal Room.. ..	72 ft. × 34 ft. × 17 ft.
Infants' Room	30 ft. × 20 ft. × 17 ft.
Class Rooms (3 each)	18 ft. × 13 ft. × 17 ft.

The system of heating (moist air) is much liked by the Teachers who find it pleasant to work in.

W. JOHNSON,

Manager.

THE LABURNUMS,

ATHERTON, near MANCHESTER,

April 10th, 1890.

Dear Sir,—In reply to your inquiry of the 8th inst., I have great pleasure in stating that I have found the "Langfield" Apparatus you supplied to be everything I could desire, and everything you promised it would be. It heats thoroughly and without smell, three rooms and the landings and adds enormously to the comfort of the house in cold weather. It is easily attended, and we find that the fire is well kept up by putting in coke three times in the 24 hours.

I cannot speak definitely as to its economy, never having gone into the question, but I find my total fuel bill for the past quarter is only one shilling more than in the corresponding quarter of last year; although fuel has advanced since that time more than 25% and I have this year had

three rooms heated as against two last year, not to speak of the landings being heated—so that I have no hesitation in saying that I consider it most economical. The saving of labor is a great and important item. In conclusion I would add that I am thoroughly satisfied with it in every respect.

Yours faithfully,

MILES F. BURROWS.

HIGHER GREEN,

ASTLEY, near MANCHESTER,

March 1st, 1890.

Mr. Langfield.

Dear Sir,—The Patent Moist Air Heating Apparatus you placed in my house in the beginning of December, 1889, has given us perfect satisfaction in every way. It keeps the atmosphere in the rooms from 60 to 65 degrees constantly. My wife who has suffered greatly for some time through bronchitis, has found great relief in the warm, moist air as it has been the means of keeping the house at one equal temperature which is a great consideration to an invalid. In economy of fuel and simplicity of working it is unequalled. I cannot praise the machine too highly and shall have great pleasure in recommending it to anyone, and I shall be glad to answer any enquiries respecting it.

WILLIAM MENSFORTH.

INDEPENDENT METHODIST CHAPEL,

PLATT BRIDGE, near WIGAN,

Sir,—The Moist Air Heating Apparatus you supplied us with on December, 23rd, 1888, has given us every satisfaction, and will raise the Chapel and School to 60 degrees in two hours, and the cost is now 1s. per week while formerly it cost 3s. 6d. We cannot praise the apparatus too highly, as all the Ministers who have visited the Chapel declare it to be far superior to any other form of heating, free from all unpleasantness and making the atmosphere fresh and moist, and most agreeable for speaking in. One of its great advantages is its simplicity, as it takes very little attention. We give this testimonial with great pleasure, and shall be glad to give all inquirers every attention in inspecting it at work.

HENRY FOSTER,

President.

To Mr. J. Langfield.

J. B. THORNLEY, Architect, Surveyor, Civil and Mining Engineer.

45, MARKET STREET, DARWEN,

December 9th, 1889.

Mr. J. Langfield.

Dear Sir,—On the 1st ult., I carefully examined your Patent Heating Apparatus as fixed in the Independent Methodist Chapel, Lowton. I put

it to the severest tests possible, with the result that I came to the conclusion it was the most economical and reliable system for warming and ventilating combined ever introduced into the market, and I unhesitatingly say it supplies a long felt need, doing away with the nauseous bad burnt air as produced by other arrangements.

Yours truly,

J. B. THORNLEY.

Numerous other Testimonials and Lists of Works executed
will be forwarded on application.

EXPERT EVIDENCE.

THE CLIFF, HIGHER BROUGHTON,
MANCHESTER,

June 4th, 1894.

I have examined the Patent Automatic Moist Air Heating Apparatus of Mr. Langfield, and have also collected samples of the air before entering the apparatus, and after leaving it, and making due allowance for temperature I do not find any difference between the air on entering and the air on leaving; the only difference which I can see that can take place is a beneficial one, that is destroying certain germs by the passage of the air through the hot pipes. This question I have not had time to verify.* The apparatus seems to me very simple, and not liable to get out of order.

A room can be thoroughly ventilated, as the hot air comes into the room at the rate of 150 cubic feet per minute,† and the temperature of the room can be kept to any desired degree.

(Signed,)

J. CARTER BELL, A.R.S.M.I.C.,

County Analyst for Cheshire, &

the County Borough of Salford, and other places.

* Test is now being made. † See pp. 3 and 4.

SCIENTIFIC WARMING & VENTILATING!

Medical Officers of Health, and Scientific Authorities

PRONOUNCE

LANGFIELD'S

PATENT

Automatic "Moist Air" Heating Apparatus

To be Unexcelled for the Efficient and Healthy
Heating of Public Buildings, Churches,
Schools, Houses, &c.,

ESPECIALLY FOR THE FOLLOWING ADVANTAGES—

It is both a Heater and Ventilator;

It is Simple in Construction and Combination;

It is Effectual and Safe in its Heating Process;

It is Applicable to Large and Small Structures;

It is Inexpensive in Cost and Economical in use

Estimates given for supplying all kinds of Buildings.
Heating Apparatus Fixed in any part of the United Kingdom.

J. LANGFIELD & CO.,

10, College Land, St. Mary's Street,

Deansgate, Manchester.