MEMOIR

OF THE LATE

DAVID BOSWELL REID,

M.D., F.R.S.E., &c.

By HUGO REID.

Suum cuique decus posteritas rependit.

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PREFACE.

My object in this publication is to vindicate the memory of a meritorious man, who, like many greater inventors, did not, during his lifetime, get the credit he deserved for what he had done, nor derive from his labours the reward he might fairly have expected. Those who have known of Dr Reid's plans for the ventilation of large buildings only by hearing them decried, will be surprised to learn that they have been in action in all their details in St George's Hall, Liverpool, for the last ten years; that they were attended with perfect success in the temporary House of Commons for the fifteen years during which that building was occupied; and that, in their essential features, they are still in operation in the Houses of Parliament.

It has been thought, also, that some brief account of his career would be acceptable to a wide circle of friends and old pupils. Of this, nothing more than a sketch, or outline, has been attempted.

H. R.

Edinburgh, *November* 1863.

MEMOIR.

DAVID BOSWELL REID was born in Edinburgh, in the year 1805, and, like most of the youth of the place in those days, received the principal part of his early education at the High School, then in the building at the foot of Infirmary Street now occupied as a surgical hospital. At that institution he picked up a little Latin and Greek in the class-room, and in the play-ground a little experience of the rubs of life, with practical lessons—sometimes rather rough ones—in the art of standing his ground in the world—these being the only instruction and training afforded by the High School of Edinburgh in the early part of this century. Professor Pillans mentions him as "among the head boys of the Rector's class." Subsequently, under the care of Mr Walter Nichol, a very able and successful teacher, whose benches were crowded with pupils, he applied himself to the study of Mathematics, and greatly distinguished himself, having, in Mr Nichol's words, "placed himself at the head of my classes."

His attention was first turned to chemistry at an early age, when he went to be assistant at the chemical works of Mr Joseph Astley, at Portobello. Mr Astley was a manufacturer of Epsom salts and sal-ammoniac, a well-informed

scientific chemist, and a man of great ingenuity, who effected improvements in almost every process he undertook. There, no doubt, Mr Reid first became practically conversant with fumes, draughts, and furnaces, which were afterwards to occupy so large a share of his attention. It is probable, also, that chemical science came a good deal under his notice in his early days, in consequence of his father's intimacy with that distinguished chemist, the late Dr John Murray of Edinburgh.

After leaving Mr Astley's, he applied himself to the study of medicine, attending the medical classes at the university, and entering at an early period on the practical duties of the profession as assistant to the medical officers of that very valuable institution, the Dispensary. While pursuing his medical studies, he joined the Royal Medical Society, a long-established and highly respectable association of medical students, for the purpose of improving themselves by writing and discussing papers on medical questions, and providing a reading-room and library. The most active, talented, and promising of the medical students were always to be found among the members of this Society, and four of the most popular and distinguished were elected yearly to be presidents. In the session 1826-7, Mr Reid was chosen senior or first president of the Society, succeeding in that office to James Phillips Kay, now better known as Sir James Kay Shuttleworth, who has done so much for the cause of education.

The following extracts are from a communication with which the writer has been favoured by Dr W. A. F. Browne, one of the Commissioners in Lunacy for Scotland, formerly one of Mr Reid's colleagues in the presidency of the Royal Medical Society :—

" My recollections of your brother, Dr D. B. Reid, are, even after a lapse of thirty years, very distinct and agreeable. This was partly the result of his prominence in the

University community, and partly because we were brought much and closely into contact. We were fellow presidents of the Royal Medical Society in 1826-7. At that time the Society was exceedingly prosperous, and contained the most distinguished and earnest students; and supplied means of training, and of testing knowledge, in which the University was deficient. Your brother took a very active part in its proceedings, and was a popular, and, upon his own subject, a powerful debater. While our respect towards him—and every one cherished such respect—was in some measure founded upon his unapproachable superiority in the much dreaded science of chemistry, the feeling was deepened by his great energy and industry, by the *abandon* of all minor objects, even of legitimate pleasures, for the pursuit of science."

"I came occasionally into contact with your brother, in the scene of his early triumphs in Roxburgh Place. I examined his experimental premises, became familiar with his views, and was impressed, not merely with the soundness of many of the principles upon which ventilation of large buildings could be effected, which he held, but felt convinced that my early friend was destined to become distinguished, and, above all, a practically useful man of science."

But he was not destined to pursue the medical profession. The rapid growth of the science of chemistry—perhaps unequalled in the history of science, unless by geology—with its numerous and daily increasing applications to the arts and manufactures, rendered it very desirable that some easy means should be afforded of acquiring practical skill in the art of experimenting. Though, no doubt, practical lessons were given by some lecturers to such pupils as desired them, and could afford to pay handsomely for them, there were no systematic practical courses, at a moderate rate, adapted to the many. Thus, hundreds, who would them-

selves have greatly benefited, as well as have conferred benefits on society by their researches, were deterred from the pursuit of chemistry experimentally, by the expense and difficulty of the first step, and the field of labourers in this new science, which had such intimate relations with almost every art and manufacture, and many branches of physical science, was greatly restricted. Towards the close of his medical studies, Mr Reid's attention was directed to this great want, and he conceived the idea of establishing systematic courses of practical lessons in chemistry, in which the pupils themselves should perform the experiments, going through all the steps of a process with their own hands, and thus at once having the facts and phenomena impressed on their minds, and acquiring a practical knowledge of chemical materials, and skill in chemical manipulation. The project, commenced under considerable difficulties, was attended with great success ; at first in a small and inconvenient room in the High School Yards, then in a room in the University, when Mr Reid became assistant to the Professor of Chemistry, and afterwards in a class-room of his own, behind the present Hall of the College of Surgeons. He continued these practical classes for upwards of thirteen years, till he removed to London in 1840. They became extremely useful and popular, and were attended by hundreds of all ages and classes,—medical students, miners, manufacturers, engineers, agriculturists, amateurs. Side by side with the youth just entering his studies, might be seen the veteran, who perhaps had served his sovereign in the four quarters of the globe, or an elderly amateur of a philosophical turn, glad to avail himself now of what, perhaps, he had longed for, but could not obtain, in his youth,—all delighted to be putting their own hands to work with the retort or the crucible, to see the metamorphoses brought about by their own efforts, to acquire practical skill in chemical operations, and to have the theory fixed in their

minds along with the practice, by the clear demonstrations given from time to time by Mr Reid. Referring to these classes, the late Dr George Wilson remarks, in his Life of Edward Forbes :—"Shortly before Edward Forbes began his medical studies, Dr David B. Reid, beyond the University walls, had commenced a system of instruction in practical chemistry, which, for the time, was a great advance. It aimed more at enabling each student to familiarize himself by experiments made under the directions of a teacher, with the properties of the chief chemical substances, and the phenomena attending their action on each other, than at making him a practical chemist in the sense of an analyst; but it did something for him also in this respect. The introducer of this system was a man of great energy, and by satisfying, to some degree, a strongly felt want of the time, laid the foundation of our educational system of practical chemistry." These practical classes were not meant to supersede the more minute analytical course, in which each pupil carried on a more careful and independent series of experiments adapted to his special object. But the practical class, organised to carry on numbers together, on moderate terms, initiated all in the rudiments of manipulation and leading facts of chemical science, and formed able practical chemists of many who required only the first start in experimenting to be able to go on for themselves.

Not long after starting his practical courses in the High School Yards, Mr Reid became assistant to Dr Hope, Professor of Chemistry in the University, by which he had the advantage of a room in the College in which to carry on his classes, and of an introduction to the very large class which then attended the course of that able lecturer. In the year 1829 the Royal College of Surgeons of Edinburgh introduced practical chemistry into the curriculum for their diploma, a step, there is reason to believe, greatly promoted by the marked success of Mr Reid's practical classes. This,

however, plaeed Mr Reid in a dilemma. To qualify a student for obtaining the diploma, it was not enough that he had the requisite knowledge and praetieal skill; these must have been acquired at the class of some privileged teacher—Professor of an University, or Fellow of the College of Physicians or of Surgeons. Mr Reid was, so to speak, an unprivileged teaeher. The College of Surgeons, however, with great liberality, eonsidering, as stated in their Report, " the very peeuliar circumstances in which Mr Reid, who has been for sometime past a most industrious and suceessful teacher of practieal chemistry, would be plaeed in consequence of the late regulations of the Royal College, were his eourses not held to qualify his students for examination," paid him the high compliment of extending to him a special license, by which his tieket should qualify for their examination for two years, thus allowing him time to qualify as a lecturer in the usual way. This he did by taking the degree of M.D., and entering the Royal College of Physicians of Edinburgh, one of the learned corporations which have the privilege of dispensing such knowledge as medical students require.

In 1833, urged on by some sanguine friends and admirers, Dr Reid was induced to lay before the patrons of the University (the Town-Council of Edinburgh) a proposal to institute in the University an independent Professorship of Practical Chemistry. Many plausible reasons were advanced in favour of this scheme, but it was strenuously opposed by Dr Hope, and the Senatus Academieus reported against it. The class was looked upon as naturally connected with the old established ehair of Chemistry, though the Professor had hitherto only delivered lectures, never having taken any part in the practical courses. It was considered that, though Dr Hope, at his advanced period of life, could not be expected to undertake it, one Professor might fulfil the duties of both classes, and that it was not desirable to

diminish (for his successors) the value of the Chemical Chair, by creating a new one. The question was remitted to the College Committee of the Council, who reported, "although only by the casting vote of the Chairman, that, "under all the circumstances, it is not expedient to do "so, at least at present." When the Council came to a vote on the subject, it appeared that they also were equally divided, fourteen being in favour of the proposal, and the same number against it. The matter was decided by the Lord Provost (Mr Learmonth) giving his casting vote against the creation of a separate Chair of Practical Chemistry. Considering the great local influence of Dr Hope and his friends, as well as of the Senatus Academicus, and the questionable expediency of the project, the vote of the Council must be taken as a strong mark of the popularity of Dr Reid and of the esteem in which he was held by his fellow-citizens. Some, doubtless, would point to it also as a proof of the unfitness of the Council for a charge, of which Parliament has now relieved them. It was perhaps fortunate for Dr Reid that the proposal was not acceded to. Had the chair been created, he would, there is little doubt, have been appointed Professor. It is by no means clear that Practical Chemistry, alone, would have been sufficiently remunerative; and it is highly probable that Dr Hope would have carried the question into the courts of law, and tested there the claim of the Council thus to encroach upon what he regarded as his rights.

Dr Reid left the College in 1833, and established himself as a private lecturer on chemistry, in a class-room which he built behind the present Surgeons' Hall. His lectures and practical classes were crowded, and he was regarded as one of the ablest, as he was one of the most popular and successful lecturers in Edinburgh. His lectures were remarkable for their style of "lucid exposition," as Dr Chalmers expressed it, and for the brilliancy and invariable

success of his experimental illustrations. He was seldom if ever placed in the awkward position of failing in an experiment—of telling his class that such a change would take place, while the inert materials defied him, and refused to exhibit the predicted phenomenon. He owed this success to his thorough knowledge of all that could affect the operation, and the extreme care he ever took in making the necessary previous preparations—qualities that, with his undoubted inventive faculty and fertility of resources, would most probably have led him to distinction as a chemist, had he not been drawn aside to other pursuits. At the close of one of his popular courses, which was attended by Sir John Leslie, Rev. Dr Chalmers, General Sir Joseph Stratton, Professors G. J. Bell and Pillans, Rev. E. B. Ramsay, Rev. J. Williams, George Combe, Esq., and many others of the principal citizens, his class, highly pleased with the course, and sensible that he had spared neither trouble nor expense—in fact, made very great exertions—to render it attractive and interesting, presented to him a piece of plate in token of their approbation and gratification. He was ever ready to aid in any movement for the public good. He originated and took an active part in promoting and conducting an exhibition of Arts and Manufactures, in 1840. His departure from his native city to settle in London was much regretted by his townsmen, who presented to him a handsome piece of plate as a token of their esteem, and gave him a farewell entertainment, at which Sir J. Graham Dalyell presided.

In 1835, when a new building for the Houses of Parliament was in contemplation, a Committee of the House of Commons was appointed to consider the subjects of warming, ventilating, and acoustics, with reference to the new building. The uncomfortable and positively injurious state of the air in the halls of the Legislature had long been complained of, and was found still more oppressive in recent

times in consequence of the long sittings which had become so frequent, the impure state of the river, factories, and a crowded population in the vicinity. In the old buildings, burned down in 1834, the Members, besides suffering from the bad state of the air, had been much incommoded by the difficulty of hearing well in many parts of the house. With respect to the air, one Member said, "Many of our eminent public men are exposed for many hours to a deleterious atmosphere in the House of Commons," and Lord Sudeley (formerly Mr Hanbury Tracey), who had been chairman of the Commissioners for selecting the design for the new Houses of Parliament, wrote in 1843, referring to the old House, "The pestilential atmosphere of the House of Commons was notorious; its baneful effects on the health and energies of its Members were painfully felt and admitted: means from time to time were resorted to, to correct the evil, till scarcely a hope, if any, remained even that it could be lessened, and the most sanguine never dreamt that it could be cured;"—and, again, "Much money had been fruitlessly expended, and the skill and science of the most learned chemists had been enlisted without any beneficial results."—No sooner had something been learned of the laws of pneumatics, towards the close of the seventeenth century, than the oppressed legislators, thinking that the philosophers knew, or ought to know, something of the matter, applied to them for relief. In the year 1700, Sir Christopher Wren, an architect, as well as a philosopher, was consulted, but was unable to effect any material improvement. A little later, Desaguliers, the eminent natural philosopher and engineer, was applied to, but with no better result. The subject was particularly considered by a Committee in 1791, and some alterations were made, but with little benefit. In 1810, Sir Humphry Davy was equally unsuccessful in endeavouring to improve the state of the air in the House of Commons. The problem was

evidently a troublesome one, from the peculiar circumstances attending the sittings of the House—some Members remaining in it often from six to eight hours or more, while the attendance was most unequal and changeable, varying from fifty to upwards of eight hundred in the course of one sitting.

In the construction of his class-room, Dr Reid had paid special attention to ventilation, and introduced very efficient arrangements for carrying off the fumes and noxious gases evolved during the numerous experiments performed daily in his lectures and practical classes. In its form, the room was admirably adapted for hearing. These circumstances having become known, Dr Reid was summoned to give his evidence before the Parliamentary Committee on acoustics and ventilation. The Committee included many leading Members of the House, as Mr B. Hawes (chairman), Mr Hanbury Tracey (Lord Sudeley), Lord Howick (now Earl Grey), Lord Granville Somerset, Lord Sandon (now Earl of Harrowby), Sir George Clerk and Mr Warburton. The witnesses examined were, Dr Birbeck, Dr Faraday, Mr Brande, Mr Sylvester, Sir Robert Smirke, and Dr Reid. On reading the evidence laid before this committee, including the questions put by the members, it is impossible to avoid being struck by three things,—*first*, the strong sense entertained by the Members of the very defective state of the House of Commons as to both ventilation and hearing; *next*, the intelligence and acuteness of the Members of the Committee, as evinced by their questions and remarks; *third*, the clear, decided and satisfactory nature of the views developed by Dr Reid. The Committee saw at once that he spoke as a man thoroughly conversant with the subject, fully alive to their wants and the evils from which they suffered, and provided with an efficient and adequate remedy. When Dr Reid proposed to apply a power to draw or force air through the House, a power which should place

the state of the air under perfect control, capable of regulation according to circumstances—and to admit the air by numerous apertures in the floor, so that while a draught should be ensured every where, it should not be felt any where—they saw that he had taken the bull by the horns, and, approving also of his plans for improving the state of the hearing in the house, the Committee resolved on a report, in which they specially directed attention to his evidence, and recommended that his plans should have a trial in the temporary House of Commons. The alterations he had proposed were made during the autumn of 1836, and were attended with complete success—a success which continued during the fifteen years which elapsed before the new Houses were occupied, and was testified to again and again, cheerfully and gratefully, by both leading Members individually, and Committees of the House. This is a well established point; but, considering what has passed, it is desirable to produce some of the evidence on which it rests.

There could be no higher authority on the subject than Lord Sudeley, the chairman of the Commissioners for selecting the design for the new Houses, who was intimately conversant with the whole progress of the question as to the ventilation of the Houses. In a letter to Dr Reid, in 1843, he states that the ventilation had been brought "to such a degree of perfection as to defy the chills of winter and the heat of summer, or the effects of numbers, however great, congregated within its walls, lessening its beneficial effects. To your skill, zeal, and determination it is owing that the Members of the House of Commons can now pursue their senatorial duties without sacrifice of either health or comfort—to you we owe the solution of the problem, that, by a proper system, ventilation may be obtained in the most trying and difficult situations." And again, in his place in the House of Lords, in 1846, Lord Sudeley "asserted that the ventilation of the House of Commons

was most complete and perfect, and was the first plan of systematic ventilation ever carried out in this or any other country." Mr Hawes, chairman of the original Committee on Ventilation, says, in a letter to Dr Reid, "You have facilitated public business and prolonged the lives of public men." A Committee of the House of Commons, in 1846, after Dr Reid's plan had been ten years in operation, reported—"The great improvement which Dr Reid has effected in the atmosphere of the existing House of Commons can be appreciated by every Member of the House, and your Committee entirely concur in what they consider to be the general opinion in its favour;" and in the same session another Committee, of which Sir Robert H. Inglis was chairman, adverting to the difficulties between Mr Barry and Dr Reid, distinctly recommended a plan of adjustment with the view of carrying out Dr Reid's plans in the new Houses. The strongest testimonies might also be produced from the Speaker (Mr Lefevre), Lord Campbell Lord Monteagle, Earl Grey, &c. Mr Horace Mann, the distinguished American educationist, in his "Report of an Educational Tour," states, "The only public edifice I saw in Europe which enjoys a perfect luxury of ventilation was the British House of Parliament. The plan is scientific and the apparatus for executing it complete;" and abundance of other testimonies from foreigners might be adduced.

One difficulty which Dr Reid experienced at the commencement of the working of his plans in the House arose from the different tastes and requirements of the members as to air and warmth. One desired a low temperature, another a high one; some members preferred the air moist, while others required a dry atmosphere; some were indifferent as to impurities, to which others were very sensitive. These varieties of feeling were caused partly by inherent constitutional differences; partly by differences as to condition at the time, such as might arise from more or

less clothing, from being heated by exercise, or the reverse, and very much depended on the state of that great regulator, the stomach. Perhaps one member

> . . . was not taken well,
> He had not dined;

another had not only dined, but dined well, and had a generous allowance of wine. Dr Reid states in his "Illustrations of Ventilation," that when the House first met after the new ventilating arrangements were in action, one member said to him, "The temperature is rising; we shall be suffocated immediately;" while another declared he was shivering from cold. Some, he states, demanded a temperature of 52°, while others were hardly satisfied with a lower temperature than 70°. These opposing feelings were humorously described by "Punch" in a clever parody of Allan Cunningham's spirited song, "A wet sheet and a flowing sea," beginning, "With wet feet on a Committee," and in which occurred the lines, after describing the opposite demands made,—

> ". . . So Dr Reid made free
> To give it to us half-and-half,
> And wretched men were we."

This difficulty, however, did not long continue to give trouble. It was soon seen that every one could not get the atmosphere peculiarly suited to him, and that some average, to be varied a little according to circumstances, must be agreed on; and the beauty of the system was that any state of the air which might be desired was at command. But Dr Reid did not exactly "make free" to give what he pleased. He was in constant communication with the Speaker and the Sergeant-at-arms, and, by consultation with them and the members, was enabled to provide an atmosphere suited to the wants of the great majority. In the work quoted above, Dr Reid says,—"The House is

heated to 62° before it is opened, and maintained in general at a temperature between 63° and 70°, according to the velocity with which the air is permitted to pass through the House. This velocity is necessarily regulated by the numbers present on a given space, the temperature to which the air can be reduced in warm weather, and the amount of moisture which it may contain when the quantity is excessive. Some members are much more affected by an excess or deficiency of moisture than by alterations of temperature." "In extremely warm weather, by increasing the velocity, air even at 75° may be rendered cool and pleasant to the feelings."

"The temperature may always be advantageously increased, and the velocity diminished, before the usual dinner hour. After dinner, other circumstances being the same, the temperature should be diminished, the velocity increased, and the amount of moisture in the air reduced, when practicable. During late debates, as they advance to two, three, four, or five in the morning, the temperature should be gradually increased as the constitution becomes more exhausted, except in cases where the excitement is extreme."

"Those who have been recently riding, dining, or engaging in any exercise, and whose circulation is accelerated, feel a medium atmosphere too warm. On the other hand, after a cold drive in a carriage, the temperature cannot be raised too high till the constitution shall have been warmed, as it were, to an average standard. In an extreme case, during the severe winter of 1840–41, several members having entered the House of Peers after being very much chilled, incessant demands were made for more and more warmth, and the temperature was at last brought to 74°. But even this was insufficient; and I accordingly suspended the ventilation entirely, and kept the air as quiescent as possible, till the effects of the excessive external cold had passed away."

Such were the varied considerations which had to be taken into account in regulating the ventilation, and by studying which, the temporary House, occupied for fifteen years, became a "luxury of ventilation," as Horace Mann expresses it; a luxury, however, or rather necessary, which members who spent from six to ten hours in the House daily for six months required, and to which they were well entitled.

At first, the cost of the new ventilating arrangements was complained of by some. Perhaps this might have been expected. People had hitherto been accustomed only to the chance action of what has been called "natural ventilation;" and not appreciating sufficiently the importance of pure air, nor the very special circumstances in which the Houses of the Legislature were placed, doubted the necessity of a system, certainly costly when contrasted with that which formerly prevailed. Retrenchment was the order of the day; and it was not unnatural to wonder at the amount now to be laid out on what had previously cost nothing. But no members who had had experience of the wretched state of the old Houses as to ventilation grudged the cost of an efficient plan for removing the evils under which they had suffered. The unreasonableness of expecting a good system of ventilation on the same easy terms as the previous methods, which had been so total a failure, soon passed away; while it came also to be seen that, for certain public buildings, thorough ventilation was an absolute necessity. As knowledge and civilisation advance, new wants are felt, such, for example, as the improvement and extension of education; but they cannot be supplied for nothing.

From the expense of the ventilation of the Houses of Parliament and St George's Hall, injustice was sometimes done to Dr Reid from the hasty inference that he could do nothing in ventilation without complex and costly methods such as had been there introduced. But he was daily im-

proving the ventilation of numbers of buildings where much simpler plans sufficed, or where, though he might advise the most efficient system, the proprietors were content with cheaper modes.

The success of the new ventilating arrangements, introduced by Dr Reid in the House of Commons having been so marked, and the benefit to the members so strongly felt and appreciated, especially by the older members who had suffered so much under the former system (or rather no-system), the Government desired that his plans should be introduced in the new Houses. Accordingly, in 1840, an arrangement was come to by which Dr Reid was to settle in London and devote part of his time to superintending the ventilation in the temporary House, and making arrangements for the ventilation of the new building. Some of his friends doubted whether, on this occasion, he exhibited sufficiently the faculty generally attributed to his countrymen, of making a good bargain for themselves, and did not wish him to leave Edinburgh, where he was much esteemed, and occupied the highest professional position with the fairest prospects for the future. But Dr Reid had publicly staked his reputation upon his ventilation schemes, and naturally seized the opportunity offered him of carrying them into operation in the foremost edifice in the kingdom, while he looked, and reasonably, to an extensive business in private consultations; a prospect fully realised till the press commenced to run him down.

But there was one unfortunate feature in the new arrangement, which led to innumerable difficulties, in both the ordinary and American sense of that word, and ultimately to the loss of his services at the Houses of Parliament. Dr Reid had not uncontrolled power to carry out whatever he judged necessary for his purpose, as he had with the temporary House. He was to consult with the architect, Mr Barry, and any differences between them were

to be referred to the Board of Works. The distinguished architect, whose genius, fine taste, and antiquarian lore, have created so noble an edifice, so truly classic, in a British application of that term, must have felt himself in a new and strange position. He was not, as in other cases, master of his own work. Another party had a right to say, There must be an inlet for air here of such a size, there an outlet, here a passage, and so on. He had been accustomed to be lord of all he surveyed, but was now to be hampered by one whom he probably viewed as an intruder into his proper domain. This could not be pleasant, but it was unavoidable; it was the penalty which architects had to pay for having ignored ventilation. As Dr Birbeck said in his evidence,—"Heat and ventilation, especially the latter, seldom enter into the mind of the builder when he projects his building,—he begins as if he did not know that ventilation could be necessary." There can be no doubt that the architect and ventilator should be one and the same person; but the Members of the House of Commons had suffered too much from bad ventilation; it was matter of notoriety that architects at that time knew little or nothing about it; and therefore another party, who had proved his knowledge and skill in the matter, had to be conjoined with the architect in the transition state of the ventilation question at the time when the new Houses of Parliament were planned. So Reid and Barry found themselves thrust into frequent communication with each other in circumstances which ultimately became fruitful in difficulties and conflicts. For a time, things went on smoothly, but about 1845, if not earlier, disputes and difficulties became more frequent and more acrimonious: ere long, the architect and the ventilator were not on speaking terms, and business between them was transacted through the medium of third parties or tedious written statements involving a fearful amount of trouble as to

matters that would have been settled in a few minutes by a few words in a friendly spirit. The Board of Works had frequently to be appealed to, and in 1846 a lengthened reference and investigation took place before Mr Gwilt, an architect, which, as in so many other cases, had no other result than a huge blue book. Some time later, the climax was reached, when Mr Barry prosecuted Dr Reid for a libel. Dr Reid had used some strong expression in characterising a paper drawn up (or sanctioned) by Mr Barry, purporting to be the minutes of a conference held. Mr Barry called on him to retract the expression or statement complained of. Dr Reid refused. Mr Barry then instituted an action at law against him. But it was ruled that the paper with the statement objected to was a "privileged communication," and the case was decided in favour of Dr Reid, who, while thus gaining his cause, suffered at the same time, as often happens, a considerable pecuniary loss.*

Any account of the career of Dr Reid would be imperfect that did not notice a circumstance which brought him into undesirable notoriety—the attacks of the Press. About this time (1845–47), he must have had some very zealous enemies. From the unwonted nature, pertinacity, and singular virulence of these attacks, as well as from circumstances which have come to his knowledge, the writer believes that, for the most part, they were instigated by persons who had strongly interested motives for depreciating Dr Reid and his plans for ventilation. On mere public

* It is not the desire of the writer to give any opinion as to whether the one or the other of these eminent men was to blame for the unfortunate difficulties that arose between them. Both have now passed from this troubled scene—"de mortuis nil nisi bonum." But, without meaning to infer therefrom that Dr Reid was in the right in this particular instance, it is due to his memory to state that he was well known as a man of a most kindly nature, affable, good natured, and obliging in his disposition and manners. That this was his general character, hundreds could testify.

grounds—such as a public journal could properly take up—they were utterly inexplicable.

When his plans had been in successful action in the House of Commons for eight years or more, and his employers and those directly affected by their operation—those who alone had access to an intimate knowledge of his works—the Government, the Board of Works, and the Members of the House of Commons—were expressing their entire satisfaction with the results, the leading daily journal began to denounce him and his system, and for a time, continued to endeavour to run him down, in a series of articles, perhaps unprecedented in the history of the Press. A few specimens are necessary to convey some idea of the statements of his assailant:—"A more egregious failure than Dr Reid's 'experiments' have hitherto proved, cannot be imagined. We have not heard of one individual to whom they have been 'extremely advantageous' except it be Dr Reid himself." "That which has hitherto proved so monstrous a failure." "The utter inefficiency of Dr Reid's system of ventilation." "The present abominable system." "He obtains a percentage on the cost of the experiments which he is hourly trying on what he may deem so vile a body as the present House of Commons." In this style, the subject was recurred to again and again, often in leading articles. Here was evinced an extraordinary determination to do all in its power to injure a man's professional reputation by a public journal; the writers in which had no occasion at all to refer to the subject, who could not meddle with it without going very much out of their way, and who were neither in a position to know, nor competent to judge of what he had done. In truth, such was their zeal in running him down, that they sometimes blamed him, and made a long tirade against him, for matters he had had nothing at all to do with.*

* The utter indifference to *facts*, sometimes exhibited by gentlemen of the

In the year 1845, Dr Reid judged it necessary to publish a reply to *The Times*. Though its attacks had not the slightest effect on the Board, the Government, or the Members of the House of Commons, who knew well how unfounded they were, they operated most injuriously against his private business, the prospect of which had been one of his main inducements to remove to London. But his reply, though most convincing to those who read it, could have little force against the denunciations of so powerful a journal, which took no notice of his defence. A journalist never cries *peccavi;* he is infallible—another Pope in fact; and, as Mr Pendennis says, "has omniscience at his pen's end, and is ready to lay down the law on any given subject—to teach any man his business." There is no doubt that these repeated attacks were successful in wounding the feelings of a faithful and laborious public servant, who had performed his duties to the entire satisfaction of his employers and of all who were in a position to be able to judge, damaged his professional reputation, and lessened greatly his professional income from private consultations. For such injuries there was no redress.

It seems proper here to quote a few lines of Dr Reid's remarks on the subject:—

"The writers in that paper, without the general or special knowledge essential for forming a judgment on the question, without inquiring whether the matter complained of was the result of my *system* or not,—without knowing whether or not I was in any degree responsible for the *management* in the particular instance referred to,—have blamed and

Press, in statements calculated to injure, is surprising. One journal asserted that Dr Reid's ventilation of the steamships of the Niger Expedition was "a total and a signal failure." For effective ventilation, this was one of his most successful works, as amply testified, on several occasions, by leading officers of the Expedition. There still seems a want of some "Code of Honour"—some established rules of courtesy, fairness, and caution, proper to be observed by writers of the Press in remarks affecting character and professional reputation.

abused me for every instance of dissatisfaction with the state of the atmosphere in the Houses of Parliament and their committee rooms; have seized every occasion to attack what I have done in other places which I have been engaged to ventilate; have again and again recurred to the subject with a pertinacity, and in a spirit showing a determination to do all in their power to injure me.

"There has always appeared to me something not directly accounted for in the conduct of the writers in *The Times* towards me. Their repeated recurrence to the subject, the pains they have taken to go out of their way to disparage my plans, their not scrupling, as I have shown, to suppress, invent, and misrepresent, either for the sake of doing me an injury, or at least proceeding with a recklessness equivalent to the same; the virulence, coarseness, and pointed personality of their style, on a subject which is eminently free from the usual sources of excitement and angry feeling,—all conspire to show a design to use their power to injure my reputation, both private and professional, or that they are the tools of others in attempting to effect this object."

Strange to say, too, the great literary periodical of the day, the "Quarterly Review," did not scruple to stoop to lend its pages to an endeavour to run him down. An article appeared there on Ventilation, the sole purport of which was to throw ridicule on his plans and his descriptions of them. It did not contain a single line of useful information, or serious discussion, but was, throughout, a tissue of those cheap commodities, ridicule and sneer; and very dull and commonplace it was. Its hardest hit was asserting that "the subject and object of Dr Reid's experiments may be reduced to the common formula of £ s. d.," which was thought so good, that the £ s. d. was brought in several times. The best joke was, suggesting that a committee, with Mr Benjamin Hawes as chairman, should inquire into

the ventilation of Noah's Ark! The article proved nothing but that some one felt very spiteful towards Dr Reid, and that the accomplished editor had been incautious in admitting a paper so unworthy in its object, and so inferior in tone and style, that he must have been heartily ashamed of it when he saw it in print.

That the freedom of the press is not an unmixed good, we have abundant proofs daily. As a people, it has brought and secured to us inestimable advantages; to individuals, on the other hand, it has often been productive of outrage and injustice. But it is seldom that this great privilege has been so grossly abused as by the writers who, leaving their proper path, and far overstepping the bounds of courtesy, common fairness, and truth, dragged into public view the subject of this memoir, and endeavoured to bring him into public odium, in a series of calumnies to which not one of them would have dared to append his name.

In 1846, the House of Lords, desirous of entering immediately into the chamber prepared for them in the new building, and believing that this would be greatly delayed by the difficulties between Dr Reid and Mr Barry, adopted a course which resulted in transferring the ventilation of their new House and other parts of the building, to the hands of the latter. This was opposed by Lord Sudeley and Lord Campbell. The first pointed to the great success of Dr Reid's plans, and objected to superseding him and appointing in his place an individual "of whose knowledge of the science of ventilation they had no proof whatever." Lord Campbell, considering what Dr Reid had done, and that he had engaged, if they allowed him the necessary powers, to make the ventilation of the House of Lords as perfect as that of the House of Commons, "thought that it would be unfair to deprive him of the honour of carrying his promises into effect." Lords Lansdowne, Grey, and others, while voting for the change, fully admitted Dr Reid's success in

the House of Commons, and regretted that the delay that would arise prevented them adopting his plans. The Duke of Wellington, with that practical sagacity which so distinguished him, thought that the two Houses should act together with respect to this question. This step on the part of the House of Lords, was attended with most serious consequences. It was, in fact, the beginning of the end. Whatever inconveniences or delays might arise from want of harmony between the architect and the ventilator, still more would it be difficult to reconcile *two ventilators* in the same building. It added to the confusion, rather than lessening it; and Dr Reid mentioned afterwards, in illustration of the additional perplexity created, that there was one room which, from the arrangement of the flues, was actually subject, as to ventilation, to *both* of the conflicting authorities. Dr Reid earnestly protested against this withdrawal of a considerable part of the building from under his charge, and showed also, but without avail, how, in a building with all its parts so connected, it would interfere with the efficient ventilation of the remainder. When the new House of Commons came to be occupied, the ventilation was in an unsatisfactory state, very different, indeed, from what had prevailed during fifteen years in the temporary House. The members now judged of the ventilation of their House by the advanced standard to which they had been accustomed for so many years in the temporary House. Dr Reid had inured them to a perfection and luxury of ventilation they never before experienced, never dreamed to be possible. Dr Reid, at his own request, it is believed, was called to the bar of the House to explain matters. His explanation resolved itself, shortly, into the existence of a divided authority, and his not having the necessary control over the adjoining rooms, corridors, &c. The House was satisfied with his explanations, and it was a very general impression that his appearance at the bar had done him much good,

and that he would now be placed in a more independent position, and armed with powers to carry out his plans in an efficient manner. A Committee of the House of Commons, which in the year 1852 inquired into the whole subject, recommended that the ventilation of the whole building should be placed under the charge of one person only, exonerated Dr Reid's system from any blame for the failure of the ventilation in the new House, and distinctly pointed out that his original plan was for the ventilation of the whole building; that he had been deprived of the superintendence of the greater portion when the works were more than half completed, and that his success had been complete at St George's Hall, Liverpool, where his plans were carried into effect from the commencement to the termination of the structure.

During that year negotiations were entered into between Dr Reid and the Government to render his appointment permanent, and give him the requisite powers to carry his plans into effect; but the adverse influences prevailed, these negotiations were abruptly broken off, and his connection with the ventilation of the Houses of Parliament ceased. A small sum was given to him as some compensation for the loss which he had sustained. This is not the place to enter on such a question, further than to say, that it was the strong conviction of those friends who knew his whole career and the proceedings connected with his removal to London, that the sum awarded him was totally inadequate to compensate for the sacrifices he had made.

This was a severe blow. Dr Reid had given up his profession as a lecturer on chemistry in Edinburgh, and sacrificed the fairest prospects, to devote himself to this great work; he had been associated with it for nearly seventeen of the best years of his life, attending at the Houses night and day, while the House was sitting, for twelve years, and. in the midst of inconceivable difficulties and annoyances.

applying himself to his task with all that zeal, industry, and indefatigable perseverance which characterised him. He looked forward hopefully to the crowning of his labours by the successful operation of his plans in this great national edifice,—a result which, there can be no doubt, would have been fully attained if, as elsewhere, the requisite powers to carry them into effect had been granted to him.

But, although Dr Reid himself did not derive from his labours the benefit he might fairly have anticipated, they have not been lost to the public. He advanced the art of ventilation a great step. He first showed that, for efficient ventilation in certain large buildings where it is specially needed, an artificial power must be applied; that it was only by the application of an adequate power that ventilation could be placed under control, and that there should be arrangements for cooling, moistening, and purifying the air, as well as for warming it; and he first exhibited a thoroughly ventilated public building. Dr Reid might be removed, but his plans could not be dispensed with. In their main features they are still carried on. With some modifications in mere details, the essential parts of his methods are still in operation in the Houses of Parliament. An adequate power is employed to draw or force air through the building, and to regulate the ventilation according to varying circumstances; the air is purified, warmed, cooled, or moistened before entering the apartment where it is to be breathed; and injurious local draughts are avoided by breaking down the currents and diffusing them widely. One of the latest writers on ventilation (*Hay*—the "Laws of Atmospheric Action") states:—

"Dr Reid is made the scapegoat, on whose head all the supposed shortcomings are laid; but, after all that has been said and *done*, the doctor's arrangements, in all their essential features, are still and again in use."

What Dr Reid did for ventilation will be best appreciated

by considering its state before he took up the subject. Something has already been said as to the former condition of the air in the House of Commons. The following additional testimonies will throw farther light on the value of his labours:—

"It is impossible to forget that the efforts of many of our most distinguished English chemists have been directed to the same object with but partial success; and that to yourself belongs, almost exclusively, the merit of having applied chemical science to the improvement of the atmosphere of crowded buildings."—*The Right Honourable the Speaker of the House of Commons*, 1843.

"The most eminent philosophers had been consulted upon the subject, to no purpose, for a century. From the varying heat and cold of the old House of Commons, and from its fetid atmosphere, the health of the members materially suffered." "Under your direction the present House of Commons has been rendered quite perfect as to hearing, temperature, and ventilation."—*The Right Honourable Lord Campbell*, 1843.

"In the temporary House of Commons, Dr Reid had the merit of exhibiting, for the first time, an air-moving mechanism equal to the demand." "Until the late House of Commons existed, as ventilated by Dr Reid, there never was in the world a room in which 500 or more persons could sit for ten hours in the day, and day after day, for long periods, not only with perfect security to health, but perfect comfort. I think an important novelty was therein achieved."—*Dr Neil Arnott, Evidence before Committee*, 1852.*

* The following is extracted from the Report of the late meetings of the Social Science Congress at Edinburgh:—"Mr Heywood alluded to Dr Reid's method of ventilating the old Houses of Parliament, and expressed his regret that that gentleman had not been allowed to carry out his plans in the new Houses, which were badly ventilated. Mr Rawlinson said, that Dr Reid had been scandalously used in the matter of the House of Commons. There was, however, a good example of his style of ventilating buildings at St George's Hall, Liverpool."

It was Dr Reid who first reduced ventilation to scientific principles, and replaced the rude, imperfect, chance and unreliable methods which formerly prevailed, by a system certain in its action, obedient to control, and capable of being regulated. That our legislators can now remain for hours in their chambers, comparatively free from the close and 'fetid atmosphere,' violent draughts, headaches, and general oppression, from which they suffered so much in former times, is due mainly to the systematic and efficient arrangements for ensuring and controlling ventilation, and supplying them with a pure and healthful atmosphere, first introduced by Dr Reid.

While thus harassed with annoyances, vexations, and ultimate total disappointment as to the great work to which he had so long devoted his time, talents, and energies, he had the satisfaction, before he left England, of seeing his next greatest work brought to a successful termination —St George's Hall, Liverpool—where his system of ventilation was in operation in all its details. His plans had been introduced there at the request of the original architect, the late H. L. Elmes, Esq., with whom, as well as with his successor, Professor Cockerell, Dr Reid's intercourse had been uniformly pleasant and harmonious during twelve years of mutual co-operation. This fine edifice, one of the most elegant, as it is also one of the largest of the public buildings of England, contains a great number of different halls and apartments, having under one roof two large assize courts, minor courts, grand jury room, judges' private rooms, barristers' library and robing rooms, with a suite of witness and other rooms, a concert room, and a great hall, capable of containing about four thousand persons. The dimensions of the latter are,—length 169 feet, breadth 100 feet, height 86 feet.

All these can be brought at once, or in such portions as may be desirable, under the action of the ventilation ; and on

some occasions, 4500 persons have been in the building, for a period of nearly ten hours; the air, by the admirable ventilating arrangements having been, during the whole time, supplied to that multitude in a pure state, and in a comfortable and agreeable condition as to temperature, moisture, &c. The power used is a 15-horse steam-engine, driving four fans, 10 feet diameter and 5 feet broad, and they can be so arranged as to act separately, or concentrated on one point. In the ventilating shafts furnaces are placed, to draw off the vitiated air, and are entirely controlled by valves. The movement of air is upward, but it can be reversed at pleasure. The air is washed before it enters the rooms, so that there is little or no dust. The opinions of engineers and others, as well as of those who frequently, and for hours at a time, are subjected to the action of the system, are entirely favourable. It has been, in part, working since 1851, the Assize Courts having been occupied then; the whole building was opened in 1854. Nothing can exceed the simplicity of the arrangement (to those who understand it); and as it is perfectly under control, any alteration is effected in an instant, either with reference to the increase or lowering of the temperature, application of moisture, or quantity of air supplied. The building is warmed by hot water and steam coils, the latter being used principally in extremely cold weather. The amount of air that can be supplied is from 30,000 to 50,000 cubic feet per minute, depending of course upon the numbers present.

The above details have been kindly supplied by Mr William Mackenzie, who has charge of the warming and ventilating at St George's Hall. A paper, describing the system, was read by him in August last, before the Institute of Mechanical Engineers, and it was the general opinion, that the ventilating arrangements were by far the most perfect in the kingdom. Mr Mackenzie states:—"Of our ventilating works, all I can say is, from practical experience,

nothing can be more perfect, and they are looked upon as the largest and most successful warming and ventilating arrangements in Europe,—so much so, that before any large building, either in this country or on the Continent, is finally arranged to be built, competent persons have been sent here to gain all the knowledge the works at this building can give them."

Such has been the result, where, as in the temporary House of Commons, Dr Reid had freedom to carry out what he regarded as essential for the effective working of his plans.

Ventilation, as conducted in the temporary House of Commons and St George's Hall, is one of the triumphs of practical science. Our political life and social customs lead us to assemble in confined spaces in hundreds or thousands, and remain there for hours together, each unceasingly poisoning the surrounding atmosphere, and liable to serious injury in health, if the poison be not removed with sufficient rapidity, if it be removed by violent local draughts, if the air around be too warm or too cold. It is, then, a public benefit to provide a sure means of removing the poison, as fast as it is poured into the air; of doing this so gently and equably, that chills from draughts shall be entirely avoided; of preserving the surrounding medium in a healthful state as to temperature and moisture, and thus enabling a dense crowd in a public hall to remain there as long as they choose in perfect comfort and perfect safety as to health. That is achieving something, and that Dr D. B. Reid first taught us how to do.

While resident in Scotland, and during the first few years after he settled in London, Dr Reid was much consulted as to the ventilation or improvement of the air in a great variety of buildings, private, as well as public, including St James' and Buckingham Palaces; and at this day, in numbers of places throughout the country, the benefits of his in-

genuity, skill and experience, are still enjoyed. His plans have been in successful operation in the prisons of Edinburgh and Perth for many years. Among other notable applications of his system may be mentioned, the ventilation of Her Majesty's royal yacht, the Victoria and Albert, and of the steamships of the Expedition to the Niger. The officers of the expedition acknowledged their strong sense of his unwearied exertions to execute the works in a very limited time, and of the thorough control over the air below decks given by his arrangements, by the presentation to him of a testimonial, accompanied by two pieces of plate.

In 1844, Dr Reid was selected as one of the Royal Commissioners for inquiring into the state of large towns and populous districts, and, along with Owen, Stephenson, De la Beche, and the other eminent men composing the commission, took part in the important inquiries which were instituted, and valuable Report, published in 1845.

In 1855, Dr Reid removed with his family to the United States. He delivered lectures at the Smithsonian Institution at Washington, at Boston, and other places, and was several times consulted by public bodies projecting sanitary reforms; but met few opportunities of being useful in the peculiar line in which he was eminent, till some time after the breaking out of the war. At last, early in the present year, the Government conferred upon him the appointment of Inspector of Military Hospitals, for which they judged his experience and acquirements peculiarly qualified him. But, like his distinguished pupil, Edward Forbes, he was cut off within a few months after he had attained a position fitted for the exercise of his talents and attainments. He died suddenly at Washington, in the course of a professional journey, of congestion of the lungs, on the 5th of April last.

Dr Reid was the second son of Dr Peter Reid, physician in Edinburgh, and Christian Arnot. Dr Peter Reid, through his mother, Elizabeth Boswell, was the representative of a

very old Fife family, the elder line of the Boswells of Balmuto, who acquired lands in that county, by marriage with one of the heiresses of Lochore, early in the reign of David Bruce. Dr D. B. Reid was the twelfth of the family, in different generations, who had borne the name of *David Boswell.* Christian Arnot was the eldest daughter of Hugo Arnot of Balcormo, a well-known advocate and antiquarian, as well as a man of great public spirit, who lived in Edinburgh towards the close of the last century. He was author of a History of Edinburgh, and a Collection of Scottish Criminal Trials. The Arnots of Balcormo were a branch of the Arnots of Arnot, who, for nearly seven hundred years, possessed the lands on the east bank of Lochleven, where Arnot Tower, a curious relic of bygone times, still rears its head, on the southern slope of Bishop's Hill. In 1834, Dr Reid married Elizabeth, second daughter of James Brown, Esq., merchant, Edinburgh, who, with five children, survives him.

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