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ON THE APPLICATION OF
SULPHUROUS ACID GAS

TO THE

PREVENTION, LIMITATION, AND CURE OF
CONTAGIOUS DISEASES,

*WITH CASES ILLUSTRATIVE OF THE ADVANTAGES
TO BE DERIVED FROM ITS EMPLOYMENT.*

BY

JAMES DEWAR, M.D.,
KIRKCALDY.

SECOND EDITION.

EDINBURGH:
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It is gratifying to record, after twelve months' experience, that the system here advocated has steadily won its way to the intelligent confidence of the public as well as of the profession. The results are in themselves highly satisfactory; and while they serve to enlarge the basis upon which the theory involved rests, they incontestibly prove that in Sulphurous Acid lies a resource amidst difficulties and danger, the social value of which it is impossible yet to estimate.

10th June, 1867.

ON DISINFECTION

BY

SULPHUROUS ACID GAS AND ITS COMPOUNDS.

“Il ne reste plus à découvrir que la matière parasiticide (insecticide), gaz, poudre ou liquide, qui détruira ces vampires de l'air.”—CHAILLOU, *February* 1866.

As the term “disinfection” presupposes the existence of some vital principle of which it is desirable that one should be rid, and at the same time a conviction that our safety from its deleterious influence lies in the practice of some unusual process which shall insure its destruction, it only remains to select that one whose efficiency is paramount; and if such combine economy with facility of production as well as of application, it will the more necessarily commend itself to our choice. In fumes of sulphur all these conditions are conveniently presented to us, combined with efficiency in the most reliable degree.

Sulphurous Acid Gas has been long known and used as a disinfectant of empty apartments, ships, etc.; but its practical usefulness was much curtailed by the unnecessary

restrictions imposed regarding it, under the mistaken belief that its fumes could not be to any extent inhaled without deleterious consequences. This danger, however, experiment at once proved to have been exaggerated, and accordingly we find now that it can be beneficially and freely applied under circumstances in which formerly it was believed to be forbidden; and I only know of one instance in which the practice was attended by disagreeable results, and that was in a case of chronic bronchitis, in which the consequent difficulty of breathing was very distressing.*

Before entering upon the subject of the present Memoir, it may be well to premise that our adoption of such an auxiliary implies a belief that the enemy of which we are in pursuit lurks about indefinitely; that its vitality can outlive ordinary processes of decay; and that it is transmitted by, or at least is located in, the atmosphere. This being the case, we may as well assume that the germs are of parasitic, most of them of vegetable, origin; that some retain their peculiar properties, independent of temperature or climate; and that some even can (as in cholera) in a dry climate, in the form of dust, be carried by the wind to distant points, where, as they absorb moisture, they regain their power of spreading devastation.

As a few practical facts are worth pages of theory, I will now explain the method by which the process here recommended is conducted; and the first experiment, I beg it to be understood, refers to the plan being carried into operation in byres or apartments *occupied* by their ordinary tenants; and as this can be accomplished not only without

* As will be seen in the second portion of this Pamphlet, the above was a hasty and incorrect conclusion.

detriment to them, but to their positive advantage, there need be no hesitation as to its adoption. "Sulphurous Acid Gas," which is evolved when sulphur is burned in the open air, is fatal to all parasitic germs; and as it has been by experience proved that man and other animals can safely respire an atmosphere admixed with it to such a degree as can forbid the co-existence of any such dangerous influences, we may easily render the objects of our interest inaccessible to them, and that by a very simple mode of procedure.

My experiments having been instituted more particularly in connection with Cattle Plague, I am therefore most conversant with the system as it has been practised in byres, etc.; and accordingly I find that the most convenient and safest apparatus consists of a chaffer two-thirds full of *red* cinders, a crucible inserted therein, and a piece of sulphur-stick.

A piece of sulphur of the length of a man's thumb will burn for nearly twenty minutes, and will be about sufficient for a byre containing six cattle; and if the usual attention has been paid to means of ventilation, which ought to be constant in their operation, the attendant may shut himself in along with the cattle without the slightest risk of detriment to either.

My own cattle have been thus treated for nearly four months, four times a day, and hundreds of others likewise, to their manifest enjoyment; and many of my friends and correspondents are so satisfied of the general advantages arising from its use, that they have intimated to me their intention of continuing the practice, irrespective of the existence of any special epidemic. That

exposure to the fumes directly, as well as indirectly, conduces to the animal's health, all of them admit; and the "blooming condition" of those which have had the benefit of it, is of itself sufficient evidence of its hygienic virtues. This it no doubt effects partly through its recognised tonic attributes, but also, and perhaps in a no less important degree, by its securing them, in virtue of its disinfecting properties, against the depressing influence of those elements of decomposition with which the air is contaminated, and with which otherwise they are left to contend; for it should ever be borne in mind that scrupulous sanitary measures—in other words, cleanliness and pure air—strictly enforced, of themselves play no unimportant part in the management of epidemics. These facts, confirmatory of its prophylactic attributes, alone possess abundant scientific and social interest; but they are completely overshadowed by the unexpected revelation, that Sulphurous Acid Gas is practically available for protection from, and the cure and even extirpation of, various contagious and other diseases.

It will simplify the understanding of what follows, if it be taken for granted that the terms "contagious" and "epidemic" are essentially of the same import; for in the one case the individual goes to the poison, while in the other the poison finds its way to the individual. As to the entire competency of the simple process under consideration for the duty in regard to which these experiments were first instituted, no one familiar with such matters will readily question; and although Cattle Plague, like other epidemics, is admittedly capricious in its course and progress, it is as reassuring as it is gratifying to be able to state that, out of

scores of homesteads where the system has been, from first to last, *thoroughly and determinedly practised*, there has not been, as far as I have been able to learn, any case of illness, not to say of death, among cattle from any epidemic cause whatever. And not only so, but this has also been accompanied by the disappearance of those ailments whose recurrence could be foretold as confidently as that of the seasons of the year,—viz., ringworm, mange, angleberries, lice, etc.; and where such existed before the system was utilised, their cure and extirpation were very easily attained.* A horse, *malgré lui*, likewise reaped benefit from the process; for having been a few times unintentionally fumigated, the owner was amazed to find that obstinate “grease of the heels” had meantime been cured.

Over pleuro-pneumonia, too, it would seem to enjoy an equal power of extinction; of which the following case affords strongly conclusive evidence:—

A large dairy in this immediate neighbourhood has, I have been informed, for nearly thirty years maintained a notorious character for mortality among its cows. The present tenant, during his occupancy of about eight years, had never been, up to the 1st November 1865, one whole month without having this disease among his stock; and within twelve months of that date he had buried sixteen cows, the last of these only *three* days before he began to fumigate. From that time till now his byres have been perfectly healthy. This man's stock (1st June, 1867) still continues healthy. He told me lately, that when he first began the process, he had one cow so ill that, after having been sold

* There is no instance of either of these diseases having reappeared in places where fumigation had been efficiently done, unless it had been *re-imported*.

for ten shillings, it was found impossible to get it out of the byre, and consequently it was allowed to remain. Strange to say, it immediately began to rally, and now lives, an excellent "milcher!" Another farmer told me last week that, after having been nearly ruined by deaths among his cows, he began daily fumigation, which he still keeps up. He has not had a sick one since.

Among the attendants upon cattle, where the system has been faithfully attended to, chilblains and chapped hands have been entirely unknown; and many, to whom these pests were the only trouble in life, have with perfect success fumigated themselves, alike for their prevention and cure.

In a very fatal epidemic among sheep, the symptoms and morbid appearances in which were so very similar to what I had witnessed in cattle as to leave no doubt, in my mind, as to its close relationship at least to Rinderpest, the results of the experiment were eminently satisfactory where the remedy was heartily and honestly applied, this having been speedily followed by amelioration in the form, as well as limitation in the spread, of the malady.

There is yet another aspect, and the most interesting, because most unexpected and most important of all, in which we are encouraged to look hopefully for some help in sulphur. The case to which I more particularly refer was one of advanced phthisis in the person of my own groom, whose downward progress others, as well as myself, watched with hopeless concern. Previous to January 1866, he had for months been wasting,—coughing, spitting blood repeatedly, and sweating profusely. His death was re-

ported again and again, and to such an issue both he and I had looked forward as inevitable. I had got, one day, some cattle for experiment from a farm where the disease was raging (and which was cleared out within ten days thereafter); and although C. was quite unfit for any exertion, as I could depend upon his fidelity for superintending the process, I begged that he would endeavour to *see* it done for fourteen days or so, lest infection should have been imported with them. He said he would try, and at once proceeded with the plan, which he has conducted with perfect success, as far as my cattle are concerned (they are the only living ones of the original herd), and with the most wonderful benefit to his *own* health which can be conceived. Within one week, the night-sweats had ceased; his cough gradually abated, and the expectoration diminished; and he has progressively gained weight, as he says, nearly two stones within four months. He is now dependent for his life upon one lung only, or nearly so; but with the exception of his being somewhat short-winded,—for a like reason that a man with only one leg must of necessity be lame,—he looks nearly as strong and is as able for ordinary stable-work as he was previous to his illness. I have shown this case to Professor Sir J. Y. Simpson, Bart., and other professional friends in Edinburgh, who are quite conversant with the facts regarding it.

This man left my service last August, his physical capabilities not being in question. He broke down in the course of the winter, but he has still confidence in “fumigation,” and practises it regularly. I have not seen him for many weeks, but I am told that he is rallying again.

Another and somewhat similar instance is that of a young woman of twenty, who for some months before the last week of March 1866 had been wasting, coughing, etc. I saw her then for the first time, and told her about fumigating. She at once adopted it, and has since filled her room with "fumes" three times a day with manifest advantage; for, while there is still evidence of extensive pulmonary disease, her condition has manifestly improved, and her cough been materially relieved. She tells me that she used to weary for the time coming, as the process uniformly gave her a feeling of relief. She is now able to be out of bed half the day; and her mother reports that she "sleeps like a child." *

Another case of "chronic phthisis," in a female of thirty, has been wonderfully soothed by the same means, which always induce in her a desire to sleep, and to which blessed restorative she had been long a stranger, until the idea of comfort in this way was suggested to her. This case also ended fatally; but from the progressive benefit for a time experienced, there is reason to believe that, had it been tried at an earlier stage, and had enough pulmonary substance remained sufficient for the purposes of respiration, a different result might have been here put on record.

Two middle-aged men, similarly affected, as reported to me by well-qualified professional brethren in different parts of the country, have equally benefited by the system, under very unpromising circumstances; and many in this

* This girl died in autumn, but to the last she said "that her life lay in sulphur." She found that her cough could be mainly *regulated* by "fumigation," and that she enjoyed longer intervals of quiescent repose.

neighbourhood have had recourse to it in the domestic management of obstinate colds, with the most favourable results.

These interesting facts regarding the use of Sulphurous Acid Gas, in connection with diseases of the chest, are not adduced as by any means conclusive evidence of sanatory value; but the unlooked-for issue of the experiment, in so far as it has in no instance been attended by otherwise than beneficial results, surely warrants farther and wider investigation.

An epidemic of "diphtheria," which appeared in a bothy of journeymen gardeners under my own care, was at once cut short by it. One case, then a second, occurred within twenty-four hours, and a third man was shivering at the fireside. Two fumigations cured them. It went no farther, and all the men were at work on the *second* day thereafter.*

The results of experience of this mode of treating recognised epidemic and other diseases, lead to the conviction that many of these, although apparently dissimilar, in reality have many points of resemblance, and certain common relations both of origin and existence. Our opportunities for closely observing facts have been much too limited to admit of any positive deductions; but, such as they are, they converge towards establishing the plausible theory of the dependence of many of these upon the presence of poisonous fungi; and that such agencies are constant in their operation is proved by this fact, that all that is requisite to insure their speedy mani-

* In the sequel will be found reports of cases strongly corroborative of its important influence over this disease.

festation is to present to them the conditions favourable to their propagation. That they are indestructible by the ordinary natural processes can be familiarly proved by the certain *re*-appearance of ringworm, etc., in places once infected; and that they are ever ready to take us at a disadvantage, chilblains and chapped hands give annually too many painful illustrations. That these latter affections should have anything in common with consumption, few will be prepared to believe; but when we find all of them associated with, and doubtless dependent upon, the presence of an infinitesimal fungus, the apparent discrepancy will at once vanish. Fungi are found to exist in connection with ulcers of various sorts, chapped hands, etc.; and on exposure to Sulphurous Acid Gas, these plants die, and the ulcers quickly heal. Fungi have been detected both in the sputa of phthisical patients, and also in the cavities from which such were expelled; and I think that there is justifiable reason to believe that this ulceration of the lung *may* have a like dependence upon the presence of a lurking parasite, as those ulcers have which exist upon the surface of the body. *Faute de mieux*, this is a warrantable theory, which is moreover substantiated by the somewhat marvellous and otherwise inexplicable results of the experience of "Sulphurous Acid Inhalation."

In verification so far of the foregoing deeply interesting and important facts, it is with no small feeling of satisfaction that I refer to the opinion of Dr Halliday Douglas, of Edinburgh, whose name will be considered an ample guarantee for accuracy of diagnosis; and of the impression which the cases referred to made upon him, the subjoined Memorandum gives a very succinct detail; and that upon

the whole it was a favourable one, is best evinced by his expressed intention of putting the matter to the test of farther experiment.

Upon a topic of such grave individual and social interest, it behoves us to speak warily, lest, by permitting ourselves to be over-sanguine, we should reap only disappointment; but I think it is not unwarrantable to look to this unhopèd-for expedient as a means of immediate practical good, in that weary cachectic state which precedes more definite morbid conditions. By reason of its acknowledged tonic virtues, too, it will doubtless fortify patients against those ever-recurring colds which, in more ways than one, conduce to the development of more serious mischief; and as the air, mixed with this gas, must of necessity be purified from every noxious element, we are encouraged to the adoption of the process by the well-founded prospect of deriving from it speedy and varied advantage. My recent experience very fully confirms what has been said as to its general hygienic properties, and in this respect it has justly merited the good opinion which its employment has earned for it. Numberless cases of "nameless delicacy" have, under its influence, undergone the most salutary changes, inaugurating an advance towards constitutional vigour, which had heretofore been beyond attainment.

So much for the applicability of this process to the persons of *living* animals; but it is capable of extensive utilisation in the direction of disinfecting "inanimate objects." In this instance we may at once proceed to intensify the "sulphurous vapour" by whatever means we can conveniently command. Steam can anywhere be im-

provided without much difficulty ; and this of itself is an important adjunct, of the sufficiency of which as a disinfectant, in combination with the fumes, one experiment will suffice to convince the most incredulous. Fumes and steam are, in all probability, sufficient for every purpose ; but as the addition of a little nitre extemporises *vitriol in vapour*, it may easily be understood how its power should be irresistible, while its facility of application would render it peculiarly suited to the purification of inanimate objects, combining as it does the *maximum* of energy with the *minimum* of expense. Hides in this way could be made safe at less than twopence each ; and as the disinfectant is present in a state of vapour, its equal and thorough application to everything within reach is, by the very nature of things, secured.

And if the operation of thorough purification is to be carried out so as to afford complete security, some means must be employed to insure the annihilation of those germs against which our efforts are directed. Let, therefore, the cleansing of byres, etc., be preceded by, carried on and completed *during*, the process of dry fumigation, which, if properly conducted, will necessarily render them incapable of farther evil influence. The use of "lime," in the first instance, ought to be authoritatively forbidden ; for the only good of "whitewash" will be to conceal and imprison the poison, which may at any time be released, to repeat to us its tale of disaster.

The latest official instructions upon this subject are antiquated, cumbersome, and insufficient ; for of what practical value can the "burning of sulphur underneath a bale of wool" have upon insuring its sanitary safety ?

Fumes, under ordinary pressure, will not enter the substance of the bale; so that, in reality, the process as recommended is to little purpose.

Another direction in which fumes might be turned with advantage, is to the purification of common sewers; for, with the help of steam power, they might be made to permeate every hole and corner, with the best results, and at little expense. At any time the system might be carried into operation with salutary benefit, but more especially in case of drought it would secure us from one of its attendant evils, and would at the same time enable us to economise our supplies of water.

In conclusion, permit me to say a few words about the conditions and circumstances under which alone parasites can successfully invade the animal body. Of these, *depreciation* of constitutional vigour is the most immediately important, as offering to those noxious cells, by which we are ever surrounded, a soil suited for their germination; and as this state of lowered vitality is readily engendered, and certainly aggravated, by neglect of strict personal as well as social sanitary observance, it will be easily understood in how far we may be said with truth to have occasionally our lives in our own hands.

The foregoing data so far attest that the prophylactic agency of Sulphurous Acid Gas can be safely and with confidence relied upon for the prevention and limitation of epidemic diseases. And surely there could not be a more appropriate time than the present for directing public attention to any means by which such scourges can be warded off, or their virulence moderated; for, with the ominous knocking of cholera at our doors, it is full

time for us to be upon the alert to do our very utmost to remove every sanitary defect, the ignoring of which, it has been over and over again proved, invites their approach and favours their dissemination.

Next comes the question of limitation; and a word of explanation will at once show the importance of intelligent attention to the means recommended for this important end. The best authorities tell us that it is in the bowel discharges that the germs of such diseases exist, and that it is in these, upon exposure to atmospheric air, that they more especially multiply, with a rapidity and to an extent that is inconceivable; hence the unspeakable importance of having such instantly disinfected by some convenient and trustworthy agent. In either diluted Sulphuric or Sulphurous Acids will be found an economical and infallible remedy, which ought upon every occasion to be at once had recourse to.

For the preservation of attendants, and perhaps to the direct advantage of the patient, fumigation by sulphur fumes may be practised constantly or as frequently as to insure a permanent taint in the apartment; and as the general testimony in my experience bears towards its *exhilarating* effects, this property alone is one of the most material interest in the management of diseases of a class that test to the uttermost the resources of the most vigorous constitution.

Since the above was written, I have perused with interest an article in the *Medical Times and Gazette*, in regard to Dr Giovanni Polli's experiments with sulphites and hyposulphites of potass, etc., etc. He proposes, by their administration, to render animals insusceptible of

zymotic changes (fermentation). It will easily be appreciated that the active agent, "Sulphurous Acid," should find access to the blood more readily by "inhalation" than by any other mode of introduction; and it possesses the double advantage of enabling the blood to resist the action of the germ which does the mischief, and of exercising upon such germ the power of annihilation.

Part Second.

SULPHUROUS ACID MEDICATION.

THE belief which was early entertained by many who have been throughout conversant with these experiments, that they promised to supply an efficient and valuable means of combating diseases of an epidemic character, has been far more than verified; for although opportunities of carrying them in the direction of Cattle Plague to the limit of the "crucial test" have been unluckily denied to us, sufficient evidence as regards the influence of the process over analogous scourges affecting the human species has in the interval accumulated to establish the title of this system to be considered the most worthy of reliance of any which has recently been proposed for such purposes.

Its influence over pleuro-pneumonia appears to be of the most complete kind; and I have ample testimony from different parts of the kingdom as to its power of driving this pestilence away from long-infected premises. The ordinary diseases of cattle have failed to *re*-appear also in

places where they have been familiar for generations ; so that by the adoption of this simple process we may, at one and the same time, get rid of many sources of inconvenience.

Horses, dogs, and poultry thrive under it, even when in health, and derive important advantages from it during sickness. Their nature is not so unlike our own but that like causes of disturbance or means of deliverance from danger may in a somewhat similar manner affect both ; and, accordingly, it is found that the nearer the approach of the objects of our solicitude to perfection in hygienic conditions, the easier it is to preserve them in health and shelter them from contagion ; and did we, in our treatment of them generally, look upon them in some measure as individually "one of the family," we would materially contribute to their welfare, and the investment would be found to pay !

Farmers tell me that "influenza" made no more progress in their stables *after* fumigation was instituted, whereas their non-conforming neighbours had the disease for long about their premises.

The daily fumigation of hen-roosts keeps down the characteristic odours of such places, fixes the ammonia, which would otherwise be lost for manure, and clears the place of vermin. I have no experience to relate of the therapeutic effects of this process upon poultry, but I had lately a message from a lady to say that, in the case of a valuable turkey-cock whose health had given way, and whose prospects seemed very desperate, in spite of all the skill which could be brought to bear upon his illness, a very few such doses sufficed to relieve him of his malady, and her of all anxiety on his account.

Meantime several striking instances of the effects of inhalation of "sulphur fumes" somewhat distracted our attention from the original experiment, and turned it into the more interesting, because more congenial, channel of observing its influence upon human ailments; nor had we long to wait, for from all quarters intelligence reached us that it was producing decided *alterative* changes in many individuals, and doing marvels in the way of curing colds, rheumatisms, constipation, and diarrhœa. That it is capable of bringing about salutary changes in the human economy, is now established beyond the reach of cavil; and in many places it has been raised to the dignity of a domestic institution, on account of the benefits which are found to accrue from its employment.

It is in virtue of this faculty, that in cases of vexatious want of health, without the existence of any positive disease (which cannot be more definitively characterised than as "nameless delicacy"), the practice of sulphurous fumigation comes in most opportunely; and there can be no question that it has been the means of enabling many to shake off certain constitutional liabilities, against which they had otherwise long struggled in vain.

Mrs —, a middle-aged widow lady, of very fragile constitution, had for years been a miserable sufferer from "hysteria" in its most inveterate form. My occasions for attendance upon her were very frequent, but although she had been from time to time "seen of many physicians," her condition a year ago was more hopeless than ever. Meantime her daughter, who was intensely delicate as well, took one of her continually-recurring colds, and I advised the mother to let me try the fumigation upon the girl, to

which she assented upon condition that it was done in the room beside herself. To this I was rather opposed, as she was confined to bed with catarrh in the chest; but as she insisted, I made no farther objection. The immediate effect upon the mother was a severe and prolonged fit of coughing, as was to be expected; but from that moment dates the end of her misery, the speedy recovery from her catarrh, and her steady progress towards perfect health, both of body and mind, which she has ever since uninterruptedly enjoyed. The practice was continued for some three months, and was repeated two or three times daily; and meanwhile the "change for the better" in the daughter was not less remarkable, for, from being an ill-thriving creature, she very shortly afterwards began to grow, and she has had in the interval no return of those ailments to which she had formerly been so subject.*

The application of this system to "epidemics," as recognised in our own species, has been followed by results so satisfactory as to convince not only professional but ordinary observers of the influence which it can exert over their progress or even existence. A few, a very few, cases have no doubt occurred, which tended to invalidate the claims to confidence, to which it was believed the process was entitled; but as these incongruities might fairly be attributed to peculiarity in the patient's constitution, or to a want of precise knowledge as to the period of "incubation," they do not weigh much against the preponderating testimony in its favour.

Again, *numberless* cases of severe fever, many of which would, under ordinary circumstances, have assumed the

* 1st January, 1867.

"continued" form, were at once cut short, and converted into that of the "ephemeral" character; and in no instance, when made use of in the beginning, did determined perseverance fail to accomplish this object.

I was asked to see a young woman, whom I found in the ninth day of "typhoid fever;" everything was tried most diligently, but without success; she died on the thirteenth day. The cottage in which this family lived had only one other small room, and in it I found a boy who had sickened on the previous day. This room was occupied by four persons, and I enjoined on them the practice of fumigation every two hours as their only hope of safety. On the fourth day the boy was convalescent; and by careful attention to the means recommended, all the others escaped.

I saw lately a lad of fourteen, who was in the fourth day of "typhoid fever," of which there was a bad case in the adjoining house. He was very torpid for the stage at which he had arrived; he had passed urine involuntarily; and I augured badly for him. Although comfortably situated in every other respect, the sanitary arrangements at the "back-door" were of the worst possible description; and as I fancied that this might have some influence on the intensity of the symptoms, I made it the condition of my continuing my attendance that a crucible containing burning sulphur should be kept going night and day between his bed and the back-door, a distance of about three yards. His hair was shortened, and he had some senna, which comprised the whole treatment. Next day he was quite intelligent; he had no other bad symptom; and on the ninth day was at the fireside. The disease went no farther

in the family. Next door, where the preservative was scouted, there were three seizures, which lingered, one way and another, for three months.

From these and other cases which it is not necessary to detail, it would appear that it is in the early period of fever only that we can place dependence upon this auxiliary. Over the *initiatory* symptoms it would seem to exercise complete control; while in those farther advanced, but not beyond the reach of remedy, it seems to shorten the attack by hastening on the various stages through which the disease ordinarily passes.

I have only seen one fatal case of continued fever among those so treated, and some of my medical brethren report to me not less encouraging accounts of this practice in their hands.

One of the simplest, but not least useful, qualities possessed by "sulphur fumes" is that of a "deodorant." For this purpose, it unquestionably takes the highest rank among the agents used for such purposes, by right of the efficiency with which it can accomplish the intended object, not less than by its singularly safe and *self-appliant* properties. Its application to the "sweetening" of sick-rooms at once recommends it to the sensibilities of all concerned; and it is a remarkable circumstance, that no one appreciates the repetition of the process so much as, certainly not more, than the unfortunate patient. Patients in the "puerperal state," and those labouring under "pyæmic fever," enjoy the "refreshing" effect of the purified atmosphere, whatever other benefit besides they may unconsciously derive; and the practice of it has, in my experience, most unmistakably contributed to recovery, under otherwise

very unfavourable conditions. "Sulphurous fumigation" is peculiarly adapted to the purification of the air of crowded apartments, such as school-rooms, etc.; and accordingly its stated adoption for such purposes is attended by the best effects. Some teachers employ it forenoon and afternoon, while the work is going on; others, during the intervals for meals; but all are at one regarding the advantages arising from the expedient, as contrasted with the well-known lassitude and tendency to headache from which teachers suffer—mainly occasioned, no doubt, by the continuous respiration of an impure atmosphere. In one village-school the spread of scarlatina of a virulent type was, to the confirmed belief of the teacher, limited by the twice-a-day fumigation to which all were subjected; for as the clothes absorb and long retain an odour of the gas, the wearer will thereby carry with him a germ-proof shelter from epidemic invasion.

The children are meantime cured of their little colds and other incidental ailments, so that the practice has much to recommend it both in a hygienic and sanatory point of view. A very simple mode of using it is to put a few *red* cinders into a kitchen-shovel, to set this upon a wooden stool upon the floor, and then to sprinkle "flour of sulphur" from time to time upon them, until the room is not inconveniently filled with fumes. The experiment is a perfectly safe one, and one trial will impart the necessary instruction.

In this county, scarlet fever has, for the last fifteen months, been prevalent, and that in a very virulent form. Our local "Registrar" informs me that the mortality in 1866 amounted to 19 per cent. of the deaths which took place. I have, notwithstanding, cognisance of about

fifty cases which occurred in my own practice, or were observed by others, and not more than ten of these proved fatal. All were treated by sulphurous fumigation, and the use of Sulphurous Acid in spray or as a gargle, wine and beef-tea taking the place of drugs; and it would now be an undertaking of no little difficulty to endeavour to disturb the strong impressions made upon the minds of the thinking portion of those who took part in the experiment, as to the undeniable good results arising from the process.

In a clergyman's family in the country, I attended five children who were all ill at the same time, and were located in one apartment. The condition of two of them was very serious; and to the assiduous and intelligent perseverance with the remedies, as practised by their father, they unquestionably owe their recovery. He had such faith in what he thought he saw the process effect, that he filled the room with "fumes" every hour; and during the "night-watch," when he was always on duty himself, he gave them a little *extra* when either showed signs of restlessness. This, he says, uniformly set them over to sleep, and the issue was favourable in each individual, without any indications of secondary mischief. In other five cases, which occurred under my care in that locality, a precisely similar result was attained; and this reverend gentleman, who has throughout been an enthusiast in this mode of treating sickness, tells me that out of all the cases that passed under his observation—in all towards twenty—not one case of "dregs" appeared; while in the village, where the deaths had been rather numerous, a large proportion died of dropsy.

Of all the other cases that were attended by myself, only two had a secondary complication, and that was dropsy with albuminuria. One of these had some twelve convulsions within a few hours; they both recovered, however. In another family which I know about, where similar treatment was adopted, eight or nine cases occurred with only one death,—one which recovered had some two hundred convulsions within forty-eight hours.

It was noticed very early in the course of these experiments, and the remark has been fully confirmed by farther experience, that the agent was possessed of three valuable, though unexpected, properties,—viz., that it was a “sedative,” a “soporific,” and an “expectorant,” in virtue of which it can render efficient aid in circumstances where drugs are forbidden, or cannot be swallowed without pain and difficulty. And it was a subject of common observation, both in cases under diphtheria and scarlatina, that while there was generally a battle about taking any kind of nourishment, the little patients never made any objection to the use of the gargle, which, in fact, they generally ended by swallowing. The immediate result was a successful cough, by which they were enabled to expectorate the viscid, offensive, and irritating secretion, of which they could not otherwise rid themselves, the patients thereafter passing into a sound sleep. The “sedative” effect of the pure acid rendered it a great favourite, and its frequently renewed application, by a large camel-hair brush, or, still better, by the spray-producer, was in almost every case impatiently demanded; and when on some occasion, the supplies having run short, water was for the time attempted to be substituted, the imposture was at once

detected and exposed. I myself on one occasion tried to deceive a friend who had "erysipelas" in his face and brow, but without success. I asked for some glycerine, which was brought me, but he said that he had tried it already without any benefit. Without any remark, I poured a little into a glass, and added, covertly, some acid which I had with me. The effect of its application was instantaneous relief of the burning uneasiness, and speedy limitation of the malady. It was for days to him a matter of surprise and speculation how the remedy, which had so palpably failed in his own hands, should have so readily succeeded in mine.

In the early stage of "croup" and diseases of an allied nature, this mode of management exercises a wonderful control. I have allowed no opportunity to escape of having its influence tested; and the results are most encouraging, for I have not seen any instance of failure to arrest the disease, even in families of children where there was a decided hereditary tendency to such complaints.

At a colliery, of which I have had the medical charge for the last thirteen years, there are numerous families connected by intermarriage; and among them, during that period, "croup" has been of very frequent occurrence, scarcely a month passing without a case presenting itself. Last autumn, however, I suggested to them the prompt adoption of the fumigation as soon as they heard any child begin to cough; and so satisfied are they of the good effects produced, that the system has been inaugurated into a regular habit, with the important result, that I have not had occasion to prescribe for, and scarcely even to see, any case of serious illness of this sort among them during the interval.

There is little reason to doubt that this same community owed its escape from an epidemic of diphtheria also to careful attention to this process, as may be judged of from the following circumstances. At last Martinmas term, a family removed from a locality where the disease had lingered for months in a very aggravated and fatal form, and settled in a farm-cottage within a hundred yards of the "Collier Row." Within a week, three of the children were ill of diphtheria, but all of them, under the persevering use of the Sulphurous Medication, recovered. A servant girl, in the school-house adjoining, was seized, and two or three others in neighbouring houses were threatened; but the epidemic could make no "head-way" in presence of the fumigation, and quickly disappeared. "Diphtheria" has been prevalent of late in this town and district, and my experience of this mode of dealing with it leads to a strong conviction of its being capable of effecting its complete extermination from infected premises. In the incipient stage, it affects a speedy cure, and even in cases which have already progressed beyond the reach of recovery, great relief is obtained from the application of the remedy; but in no instance, not even in houses where the victims lay yet unburied, has a fresh seizure occurred after the fumigating plan has been put in operation.* The following case will serve to establish the authenticity of what has been advanced:—On my return, after a short absence from home last autumn, I learned that a widow, whose family I had previously attended, had lost a daughter from diphtheria, and I was asked to visit an elder sister who was suffering from the same malady. The cottage in which she resided

* As will be seen by-and-by, this rule is not *altogether* without exception.

consists of two apartments, each containing one bed ; that in the kitchen was occupied by a corpse, the other by my patient, who I found had been ill for three or four days. She was typhoid, and her pulse was unsteady, and she ultimately died ; but to the last moment of her consciousness she begged for the Sulphurous Acid mixture, which she said gave her indescribable relief. The mother told me that she herself had been shivering the greater part of the night, and complained of headache and severe sore throat. I had some sulphur burned in each room without delay, and instructed them to have it repeated every hour till the evening, when, on my second visit, I was gratified to learn that the first fumigation had sufficed to dispel all her threatening symptoms. The daughter lingered for three days thereafter, but, notwithstanding the continued existence of this form of infection, the disease spread no farther in the family, which, moreover, was a numerous one.

The value of this auxiliary in the prevention and cure of this inveterate and unmanageable scourge, is much enhanced by the unvarying uniformity which marks the success of its timely employment ; but of the number of cases which I have seen, I would more especially note two, as illustrating the immediate and important advantage arising from the conjunction of the topical use of pure Sulphurous Acid to the fauces, and as giving an idea of the extent to which this may be carried, not only with safety, but with conspicuous benefit. One was that of a young woman, in whom the false membrane formed with unusual rapidity, the accompanying symptoms being of a "typhoid" character. She suffered intense pain, and early in the attack was drowsy and delirious. The acid was

applied *pure* by means of a large camel-hair brush, and instructions were given for its due performance every hour; but so marvellous was the comfort derived, that its repetition was impatiently demanded every fifteen minutes. Each time the operation was followed by the expectoration of viscid matter, after which she enjoyed an interval of calm sleep; and after thirty hours' unremitting perseverance (during which period she must have swallowed not less than six ounces of the acid), the disease abated, and she made an excellent, though rather tedious, recovery.

The other case is that of a young man, a blacksmith, who occupied the same sleeping-apartment with four fellow-workmen. He had sickened the day before I saw him, and although no sloughs had made their appearance, his general condition indicated an attack of a serious nature. I had the fumigation set agoing at once, and applied the liquid acid by means of "Richardson's Spray-producer."* The relief was instantaneous, and so decided as to induce him to repeat the process every quarter of an hour for five hours, by which time he was so much better, as to be able to go home by train to Edinburgh, where his convalescence advanced without any farther interruption. That this was a case of true diphtheria will not admit of question; for besides its recognised existence in the district, a fatal case had occurred next door on the day previous to this man's seizure.

One important fact in connection with this mode of

* The satisfactory results of the inhalation of "fumes" and steam conjoined gradually led to the use of artificially-produced sulphurous acid spray, and the principal objection to the above-mentioned instrument lay in its being very liable to corrosion.

treating this disease, stands out in interesting contrast to the not unusual fate of those who recover under other methods, and it lies in the entire *absence* of those sequelæ by which the cure is so seriously retarded, or life even a second time endangered. And, fortunately, the age of the patient need be no barrier to its being put in practice, for even very young children soon connect the relief which is obtained with the taking of the medicine, and, accordingly, no difficulty is encountered in its administration. Five drops of acid in half a tea-spoonful of water, given every quarter of an hour, is soon looked upon as a boon, and it is uniformly asked for in preference to wine, beef-tea, or water.

The following cases of "diphtheria" carry with them an important lesson as to the absolute necessity for the prompt use of measures in such terrible circumstances:—

Some weeks ago I had a sad struggle with "diphtheria," in which, however, under the most unfavourable circumstances, Sulphurous Medication won the confidence of a whole community by the success which attended its employment.

I was asked to see a girl who lived in a small cottage which, with some dozen others, forms a small square of colliers' houses. The family consisted of the father and mother and four children, of which my patient was the eldest. She was in bed, supported by her mother's shoulder; her breath was dreadfully foetid, the fauces being filled with false membranes. She had been ill eight days, and she died next morning, without the treatment having any other than a temporarily deodorising effect. A younger sister was sitting by the fire, on the

occasion of my first visit, holding a child upon her knee, whose condition was the most repulsive I ever saw. Its head was enormously swollen, with tumefaction of all the glands in the neighbourhood; the scalp was covered with crusts (eczematous), which were surrounded or rather connected by erythema of a very unhealthy colour; the ears, which had been discharging for some time, were occupied by diphtheritic sloughs, and the odours emitted were appalling even to the parents. This child enjoyed greatly the application of "spray" to the fauces and ears, but died towards the end of the week. When I paid my third visit, I found that both nurses, mother and daughter, had been taken ill; but from the advanced stage at which in the latter the disease had arrived, as indicated by the condition of the tonsils, there is every reason to believe that her illness had been overlooked. This girl died on the fifth day, without having derived anything more than temporary relief from the remedies. The mother, on the other hand, had the benefit of having the agent employed *at the very outset*, and she made a speedy recovery. The same thing occurred in the case of her sister, who came to assist in nursing; for having instructed them in the use of the "spray-producer," I left one with them, and it was thenceforward had recourse to without delay, and as often as occasion required.

The history of the remaining little girl is melancholy, but it is instructive. She was seized at the same time as her aunt, and occupied with her the adjoining room. She was subjected to the same treatment, and all went well. She was apparently convalescent, when unfortunately her mother had sanctioned her being brought to her own bed,

where, to my horror, I found her sharing the same pillow with her dying sister, and where she had slept during the whole night. It will not surprise any one, in these circumstances, to be told that a relapse immediately followed, which ended fatally. The father, last of all, passed through an attack, but of so mild a nature as to show that the serpent had been robbed of his sting ; and none are more hearty in their recommendations to perseverance in, and watchfulness as to the timely use of, the remedy, than these childless parents of the only victims to the malady.

The limited accommodation of this residence no doubt contributed to increase the virulency of the infection, to which each member of the family was in succession exposed ; but the main error lay in the disease being *permitted* to take undisputed possession of the premises. That such is a fair explanation may be gathered from the farther history of the epidemic in the locality ; for, with external conditions in no way different, the experience of the neighbours affords interesting and important lessons which substantiate the title of this system as a reliable auxiliary in times of desperate need.

When I first visited this unfortunate family, I was asked to see a lad in the same Row, who had been seized in his throat upon the previous day ; there was a moderate slough upon one tonsil, but this formed no hindrance to his prompt recovery ; for the fumigation, etc., having been set agoing, it was determinedly persisted in, and by next day his disease had almost entirely left him. The other inhabitants, old and young, have in the interval, almost without any exception, passed through an epidemic of "tonsillitis and laryngitis," but that of so benign a form as to be

completely under the direction of the Sulphurous Acid treatment, which was eagerly adopted on the first suspicious indication, while a growing belief in the efficacy of fumigation led to its thorough and cheerfully-repeated employment. Of cases such as those just referred to, I saw not less than thirty-five within a fortnight; and as there is every reason to believe that, from first to last, all were the result of the same "epidemic influence," it is fearful to contemplate what might have been the report to-day, but for the blessed protection afforded by this simple but efficient means of safety.

One apparent advantage of this process is the ease with which it can be made available to the patient, and that *nolens volens*. The spray was applied by a "vaporizer," which I had constructed for me in "vulcanite," those of metal having been found to corrode, while glass ones are unsuitable, from their being easily broken. The shower projected is like the "gentle dew," and can be directed very conveniently against a child's mouth from a distance of three feet—a no small practical benefit. Another mode of attaining a similar object was, by making the patient inhale steam from a jug, now and then, while the fumigation was going on, which makes one, for the time being, so far independent of an instrument, and can be resorted to at a moment's notice. "Fumigation," as a rule, was practised every two hours during this invasion, and there is not a single dissentient from the firm belief in the importance of the means employed—the wonderful uniformity of effect attending it having left a strong impression upon the minds of those who had opportunities of making the necessary observations. The process may be renewed *ad libitum*,

as the object intended is that there should be the nearest possible approach to a constant taint of the "fumes" being appreciable to the senses.

A very interesting case, as illustrative of the general hygienic and other advantages which sulphurous fumigation can confer, occurred to me in the ordinary course of practice about three months ago: it was that of a young married woman from Lanarkshire, who, on account of the state of her health, had been brought to reside for a time with her friends in this neighbourhood. Some months previous she had received a severe shock from the sudden death of a neighbour of cholera, which unhinged her reason and reduced her to a state of religious despondency. When I saw her she was thin, worn, and anæmic, her skin and lips dry and unhealthy-looking, while her manner was morose and melancholy in the extreme; and for weeks she had been almost entirely sleepless. Generous diet, with wine, iron, and chlorate of potash, were administered; but the sleeplessness continued in spite of opiates, which were not found to suit well with her. I then determined to try stated fumigation, which was accordingly resorted to every fourth hour for some time, with the effect of working an important change in her condition, for she slept many hours consecutively on the very first night, and looked next day as if her "burden was somewhat less heavy to bear." From that time her progress was uninterrupted, her delusions gradually losing hold upon her mind as her physical circumstances improved, and she returned home some weeks ago full of flesh and in good spirits.

Another instance in which the beneficial influence of

sulphur fumes was unmistakably exemplified, was that of a man who was subject to frequent attacks of vomiting, which, in the entire absence of any other prominent symptom, a well-known Hospital physician and I equally failed to localise. His strength was failing rapidly, and the temporary relief which opiates afforded did not make up to him for the aggravation of the sickness which followed their employment; and, as a last resource, I made his wife fumigate the apartment every hour, as at least a safe expedient. The immediate result was very wonderful, his wife observing that at first he fell to sleep as soon as the retching ceased; then, that the intervals between his fits of nausea gradually lengthened, during which wakefulness was the exception, until, after about ten days' perseverance, the attack gradually passed off, and he has had, for a number of weeks, no return of his ailment. He has long since returned to his work, but still prudently adheres to the stated repetition of the process.

A correspondent tells me that a young lady, a patient of his, who had long suffered from intractable chronic vomiting, had derived similar benefit from the same course of procedure.

In "bed-sores," Sulphurous Acid very soon induces salutary changes; and the occurrence of these evils can be perhaps entirely prevented by its timely application to parts which give indication of suffering from pressure. Circumstances do occasionally present themselves, in which patients cannot bear the fatigue of having their bed-linen changed, and it will here be found that sprinkling the acid freely about the bed does away with many of the *désagréments* which would otherwise necessarily arise.

This agent is found to interpose effectively in preventing decomposition and decay; and in this point of view I have tested its influence over toothache with hitherto uniform success. Teeth that have given annoyance for weeks continuously, have become immediately and permanently painless under the use of the "spray," which has the advantage of being able to insinuate itself into the most tortuous cavity.

I can point to five patients who have the most perfect confidence in Sulphurous Acid as a cure for facial-neuralgia. In the form of spray, or applied by means of a camel-hair brush or soft muslin, it soon removed the fit of pain, and, if one may judge from the greatly lengthened interval which has already elapsed without any return, has apparently rendered them less liable to its unwelcome recurrence. A pledget of muslin, soaked in the liquid and inserted between the cheek and the gum, was found to suit the purpose well.

The general results of experience in this method of waging war against disease prove very strongly that the implicit faith which, "in the olden time," was conceded to "new flannel," was not only not misplaced but was unquestionably in accordance with scientific truth, of which our ancestors enjoyed a prescient anticipation; and so satisfied were they of the general benefits conferred, that I am told it was an annual custom to send their flannel body-clothing to be again subjected to the process of fumigation in the kilns at the wool-factories. Dr H. Douglas, too, informs me that, in corroboration of this popular belief, he had a communication lately from some one in the south of Scotland, to say that, from time

immemorial, it has been considered a matter of the highest importance to obtain, for a delicate member of a family, employment in the room where woollen goods are first operated upon after leaving the fumigating chamber. And, accordingly, it is found upon trial that the *saturation* of a set of bed-clothes by exposure to sulphur fumes is of essential service in gout and rheumatism, by soothing the pain and inducing relaxation of the skin and tendency to sleep.

Last autumn I was asked to visit a gentleman whom I had often attended during his attacks of gout, on account of another visit from his hereditary enemy, complicated with diphtheria. I found him in a state of great suffering, in high fever, and with an amount of nervous excitement about him which was not his usual. The acid was diligently applied to his throat, the room was fumigated every hour, and a set of bed-clothes were exposed to very strong fumes in a dressing-closet. They were spread over the patient, who immediately afterwards fell asleep, his skin became bathed in perspiration, and when he awoke, hours afterwards, the severity of his symptoms was found to have passed away.

Some weeks ago I was asked to see a middle-aged woman who had been under rheumatism for nine days. She was very feverish, and said that since her attack she had never got rid of a tendency to shivering. I had her bed-clothes treated after a similar fashion, and the process was renewed every eighth hour. When I saw her next day, she said that, within fifteen minutes after the process was adopted, the morbid feeling of her skin left her and she fell asleep, waking, hours afterwards, wet with perspiration, and almost entirely free from pain.

“ Chilblains ” and “ chaps ” of every sort, and apparently in every situation where they are met with, are speedily cured, and that infallibly.* Among many other cases, I may mention that of the Rev. —. He writes that his daughter, who had long been a sufferer from them in her feet, was last winter perfectly lame, and that although he had lost all faith in remedies, he had resolved to try the sulphur fumes. The feet were accordingly held in the vapour for ten minutes, morning and evening, during three days, when a complete cure was found to have been effected ; and a subsequent report states that no difficulty has been met with in keeping the disease in subjection. The servant-girl who assisted at the operation had had for some indefinite period very painfully chapped-hands, and she was no less surprised than delighted to find that her sores had also quickly healed. But there was still another inmate of the apartment, where the “ innovation ” was quietly being put upon its merits, who unexpectedly got rid of an obstinate “ cold ” during his anxious superintendence of the somewhat “ uncanny ” process, and that was the “ minister himsel,” who has since conscientiously embraced every opportunity of making converts to the heresy.

Many similar instances could be adduced, in which the same comfortable results were attained ; and indeed there is every reason to believe that this, as well as other analogous diseases, can no more resist the action of this remedy, than the “ flour of sulphur ” can that of red-hot cinders. One case, however, I would mention, as

* Sulphurous Acid is the best of all dressings for “ sore nipples,” one soaking of *pure* acid generally effecting a cure, and it does not harm the child.

showing that cure, even in those who may have for long periods been victims, need not be despaired of; but also as throwing some light upon the real nature of the disease (chilblains), as well as of the manner in which the agent effects its salutary purpose.

Mr ———, somewhat elderly, who has long discharged the duties of cashier in a large establishment in this neighbourhood, asked me some months ago what he should do with his hands, which were positively so covered with chilblains as to render his work very burdensome to him. He had all his life been subject to them, but he said that now, even in summer, he was scarcely clear of them—the tendency to swelling never altogether disappearing. His hands were unshapely and much swollen, the skin being livid and very unhealthy. Fumigation gave him some relief, but he used at the same time a lotion composed of one part sulphurous acid, one part glycerine, and two water, three or four times a day. His improvement was rapid, the bad features quickly giving place to freedom from pain and restoration of power over the fingers. The case was rendered complete by *desquamation of the entire cuticle*, leaving the hands unexceptionable as to appearance, and hitherto quite easily preserved from any recurrence of the ailment.

In bronchitis and asthma of every degree this mode of treatment is attended by the most satisfactory results. In cases even of old standing, the practice of it has given most marked relief, while the ordinary complication of "dilated air-cells" forms no barrier to its beneficial application. In whatever stage I find my patient, I at once proceed to apply the spray, which, by loosening the expectoration,

facilitates its expulsion, so that the chest can be wonderfully cleared of it in a few minutes. Cough is no doubt excited, but this does not deter patients from its use, finding, as they do, that they are more than repaid for the temporary inconvenience.

J. K., 10 years, for several winters previous to that of 1865 had been subject to frequent attacks of "bronchitis," and was essentially delicate. In November of that year, his father, a land-steward, began the system of fumigating the cattle-sheds, and as they immediately adjoin his dwelling-house, the boy very frequently accompanied him during the operation. His health, in accordance with what is now known as the rule of experience, immediately began to mend; and although exposed to all weathers in walking two and a half miles to and from school, he had no illness of any sort from that date up to 31st January 1867. Meantime the fumigation had been suspended, and his old enemy laid hold of him; but the Sulphurous Acid treatment being had recourse to, it speedily gave him the desired relief, and seemed to cut the disease short, without necessitating a tedious passage through its familiar stages.

— B., 45, colliery engineer, for more than ten years has felt the gradual encroachment of "asthma," which unfitted him for even his easy duties for some weeks during winter and spring. The "inhalation" of spray and fumes has benefited him much, and he finds that their daily employment renders him comparatively independent of the season. In such a case *cure* is impossible, but advantage may rationally be expected from the use of this agent, both by its ability to render the "pulmonary mucous

membrane" less sensitive to atmospheric impressions, as well as from the faculty which it possesses of disinfecting the impure elements of respiration, which, being by the very nature of things imprisoned in the dilated cells, cannot otherwise fail of aggravating the patient's condition.

— F., now a post-runner, formerly a miner, has been asthmatic for many years. In January last his condition became much aggravated, and, after ten weeks' struggle, he was obliged to abandon his duty. I found him terribly oppressed, his attempts at expectoration being distressing because unsuccessful. The spray enabled him at the outset to begin the process of clearance; his improvement under the conjoined remedies was progressive, and in the course of five days there was scarcely a râle to be heard in his chest. The spray was applied twice a day, and his room was filled with "fumes" every four or six hours. He has long since gone back to his work, and he told me yesterday (May 4, 1867) that he is in better "wind" than he has been for ten years.

J. P. had been ill for weeks before I saw him, his breathing difficult, and his efforts at expectoration almost fruitless. I persevered, pumping in the spray at intervals for some twenty minutes, until his chest was much relieved and almost noiseless. Next day this was repeated, and in a few days he was at work.

Mr —, farmer, after repeated attacks of "congestion of the lungs," had in 1866 a seizure of bronchitis, which resulted in "emphysema." Dr — saw him twelve months ago, and both he and I thought that our patient must just make up his mind to a life of comparative inaction; and up to November last his condition did not

undergo any material change. His breathing was laboured and noisy, and in bed his cough was troublesome, with a good deal of expectoration. He was subject to polypus in the nose, and as I had previously removed successive crops of them, he came to me at Martinmas to have his nostrils again cleared of them. As I could not resist the opportunity of trying the effect of Sulphurous Acid spray in such an interesting case, I accordingly applied it at once (with some little confidence in its conferring perhaps a double benefit). I encouraged him to sniff the vapour forcibly through his nose, and if possible to draw it into his lungs. Before he left me he could "blow his nose," which he had not been able to do for many weeks. From that time his improvement has been progressive. By his daily perseverance for weeks, his nostrils have been cleared, and his chest-symptoms wonderfully amended; the cough gives him little annoyance, and his expectoration is reduced to a "little in the morning." It was my good fortune, upon the 21st ult., to be enabled to show this, among other cases, to a well-known member of the profession from England, who examined carefully, and was interested to find that no "moist sounds" could be detected. The best evidence of renewed constitutional vigour was given by the patient himself, who said that he had been "*sowing beans*" *all morning*.*

I could easily multiply the number of cases such as those just detailed, but this is quite unnecessary, as like favourable advantages have many times accrued in individuals otherwise abandoned to hopeless suffering. That this agent exercises a really *curative* influence upon the pulmonary

* 1st May, 1867.

mucous membrane, the rapid improvement in the health and the comparative immunity from other attacks of bronchitis in those so operated upon, sufficiently testify, while the simplicity and perfect safety with which the process can be employed, render it peculiarly suitable for the desired purpose.

The following cases are interesting and highly encouraging :—

The Rev. — for fifteen years had suffered from disease of his throat, rendering preaching laborious. General health “below par;” obliged to change his “underclothing” between services, so uncomfortable was he from perspiration; had tried everything without good result; began the Sulphurous Acid inhalation (besides “fumigating” twice or thrice a day); improvement immediately commenced, and a cure was speedily effected. General health has since greatly mended, and finds his duties now no burden.

The Rev. — called for me, to inquire about sulphurous treatment of throats. He had suffered from his ailment for many years, which made him quite pluckless, and afraid to undertake duty, from a feeling of nervousness. I examined his throat, and, without any remark, applied the spray. He instantaneously felt relief, and said that he could command his voice in a way he had not done for long. He asked me what I had used, and was surprised to learn that it was Sulphurous Acid, as he had believed that the remedy of which he was in search was sulphur *pur et simple*. The last accounts I had from him were satisfactory.

The Rev. — had been a victim to this malady for twenty years; found himself very ill able to discharge his duties,

from want of vigour and unconquerable nervousness, which especially laid hold of him when he had occasion to pronounce words containing certain consonants. Was in a state of agitation at the idea of having the spray applied; but nevertheless he at once clapt his hands, and exclaimed, "Delightful!" At the end of a month he returned to London, and is now in perfect health, and fit for any duty. He conjoined fumigation with the use of the spray. It is interesting to note that each of these gentlemen used the same figure to illustrate the feeling of relief which they had obtained, which was, "That something which for years had been loose in the windpipe had suddenly been 'braced up,'" which, doubtless, was no inaccurate explanation of the real change which was effected upon the vocal chords.

Miss — came home from London last season, changed somewhat in her appearance, and showing symptoms which naturally made her parents anxious. She had lost flesh, had a tickling cough, and a tendency to flush. Upon examination, the chest proved all right, but the condition of the mucous membrane of the pharynx and larynx was evidently sufficient to account for the cough at least. The spray was applied a few times, when the disease was quickly eradicated, and a return to wonted health has been the satisfactory issue.

Mrs —. This lady had for several years been obliged to winter in a southern climate, on account of liability to catch cold, and general delicacy of health. I saw her early last summer, and, from the satisfactory state of her chest, was led to believe that she was likely to be benefited by "Sulphurous Acid Medication." Both processes were adopted with immediate advantage. She

rapidly regained her health, and, when I last heard of her, she was taking on flesh, and felt strong and well. She had persistently put in practice the plan recommended, and was to continue it during the present winter.

Miss ——. Last autumn I was asked to see a young lady from Edinburgh, whose general condition had recently given her friends much anxiety; and when I visited her it seemed to me that her appearance, coupled with what I was told were her symptoms, fully justified the apprehensions entertained concerning her. The family history being somewhat ambiguous, I was fully prepared to find something wrong in the chest, but in this I was very agreeably disappointed. The appearance of the fauces, however, was such as to account for everything, as I thought, and accordingly the spray was applied with the usual good effects; and under the influence of this and fumigation the patient has progressed marvellously. I have not seen her again, but the last report said that she was so well as to think confinement to the house at night unnecessary and very irksome.

A very interesting case of cure of an obstinate laryngeal affection of many years' standing has lately passed under my observation. Mrs —— had long suffered from this disease, which had baffled all attempts at remedy, although she had consulted the most eminent medical men in different parts of Europe. Some weeks ago I had occasion to see her, and took the opportunity of recommending and applying the spray. I left the apparatus with her, enjoining its use four times a day, and she writes me to say that her throat is quite well, and that she enjoys a sense of returning vigour which she had not hoped to attain.

Last week a young lady, who used to sing very nicely, called for me to ask whether I thought the remedy in question would benefit her, as for months she had been unable to sing as was her wont, and besides had suffered from uneasiness in the chest, which naturally gave her some concern. Her case appearing to be a suitable one, the spray was applied at short intervals during a *séance* of five minutes, and she arranged to come again each morning to have the process repeated a few times. When I next saw her, she joyously said that she was quite relieved of every feeling of discomfort, and "that she had sung as well last night as ever she had done!"

In consideration of the many hygienic advantages which this system has proved itself equal to bestow, it will appear less irrational to hope that even "phthisis" may not be beyond the pale of its salutary influence; and cases have during the last year occurred—some under my more immediate observation, and others under that of friends and correspondents—wherein the circumstances regarding either the true nature of the disease, or the beneficial effects of the plan adopted, could not well be questioned. The highly satisfactory results of this mode of treating diseases of the respiratory organs are well seen in the two following cases, which are good examples of what this system can accomplish under equivocal and very unpromising circumstances. In both there was an obvious and inveterate "tendency to death," through pulmonary disease of long standing, attended by cough, breathlessness, irritative fever, and progressive emaciation.

Last summer I was asked to see a girl of thirteen, who had been ailing seriously for twelve months, and who had

been brought to this neighbourhood for "change of air" as a *dernier ressort*. I learned that her illness began in diphtheria, from which she never recovered, but gradually passed into her then condition, with symptoms which led her friends to believe that she was far gone in "decline." I certainly formed the worst opinion of her prospects, but nevertheless advised the fumigation to be fairly tried with her. This was done four times a day for two weeks, and I thereafter lost sight of her, and, indeed, made no inquiry after her, as she had been taken home, and I scarcely doubted that she was dead. Judge of my surprise, therefore, when, eight months afterwards, a man stopped me upon the road, and asked me if I did not recognise his daughter, who was standing by his side. This I could not possibly do, for here was my patient transformed into a healthy plump girl, without a trace of any illness about her. Her father said that her improvement commenced as soon as the process was begun, and that the latter had been continued for six weeks.

Last autumn I saw, along with a professional friend, a young married woman who for some months had laboured under progressive disease of her chest, which at last had confined her entirely to bed. Her original disease had evidently been pleurisy resulting in empyema, and there was a fistulous opening near the edge of the scapula, from which pus occasionally spurted, but oozed constantly. There were loud râles over every part of the chest, to which the air could get access; her cough was very harassing, and her strength was fast failing her.

As I had lately seen some instances in which this agent showed that, in some unaccountable way, it seemed

to exercise control over the existence of pus, I was somewhat more hopeful about her case than my previous experience would have warranted, and accordingly fumigation was instituted several times a day, and the spray was applied regularly by inhalation. I heard nothing more of her for some months, when I was gratified to hear that she was so far recovered as to be able for the discharge of her ordinary domestic duties.

I am glad to have it in my power to adduce a few cases of a more definitively phthisical character as having been diagnosed by others, and communicated to me by them, or by the patients themselves.

A young Scotch servant-girl in London was sent to the Brompton Hospital on account of disease in her chest, where the opinion of the family physician as to her being in phthisis was confirmed. After having been some short time there, she was recommended to seek her "native air," and accordingly she came down to this part of the country; as the words of my informant, the clergyman of the village, express it, "She was sent home to die." Fortunately for her, however, this gentleman had great faith in the effects of fumigation, from what had passed under his own immediate observation, and he without loss of time set her vigorously to work at the experiment, and his later report bears that she has greatly improved, and is now able to undertake the superintendence of her father's home.

Some months ago, a man whom I never saw, a cabinet-maker, sent his sister to me with a letter, a portion of which ran as follows:—It stated that after having been some months off work, he had gone a second time to consult Dr —, a well-known Hospital physician in Edin-

burgh, who had advised him, on account of the unsatisfactory state of his chest, to pass the winter in the south of England. He says "that it was after going home (October) that I first heard of the fumigation," which was immediately and statedly practised, and "now (December) I am well and fat, and able for my work." A neighbour's wife also, who had lost several near relations by consumption, he reports, was trying it with good effect.

The medical gentleman referred to told me, upon inquiry, that he had no doubt that this man had tubercular disease.*

Dr Halliday Douglas informs me, that some time ago he had a letter from a gentleman resident in Wales, where he had been advised to winter by an eminent London physician, who had found him to be phthisical. After having been there for some time, he discovered that his comfort depended greatly upon the direction of the wind, and that he was always best when it was in a certain quarter. It was not, however, until after he had heard of sulphurous fumigation that an explanation of this enigma was afforded him, when it turned out that the wind that blew "fair" for him passed over some adjacent "smelting-furnaces," the emanations from which are partly constituted of the agent under consideration. He immediately had recourse to the regular employment of the remedy, from which he says that he has derived great benefit.

* I have this morning heard from a gentleman, to the effect that his gardener, who some months ago had all the symptoms of "rapid consumption" about him, and, according to medical testimony, had tubercles as well, had at his instigation tried stated fumigation, and with the best results. "From the first the night-sweats stopped, his appetite returned, he gained flesh and strength; and, although he has some cough, is going about his work as formerly. I had him examined again by the doctor yesterday, who was surprised at his progress," etc. (6th June, 1867.)

A medical gentleman writes me in regard to the wonderful improvement which his sister has experienced since she began the fumigation, to the extent that she has this winter been able to dispense with her respirator, and to be abroad in all weathers. He says that he has tried it in two other cases of phthisis, also with beneficial results.

A friend asked me lately about his brother, who, he said, was going down very fast under disease of one lung, which was said to be consolidated. The remedies which those medical men who had seen him had prescribed had no effect in checking the progress of his complaint, which was looked upon as phthisis. As he was desirous that Sulphurous Medication should have a trial, I gave him the necessary instructions, which were forthwith carried into practice; and the report to me was that, after three weeks' experience, he found his condition decidedly ameliorated. I have not heard anything of him since.*

The influence of Sulphurous Medication in the healing of "breaches of the skin" is one of infinite practical value. In sores of long standing, the use of the Sulphurous Acid lotion is speedily followed by a change for the better, and even ulcers of fourteen years' duration, associated with a varicose condition of the veins, have been found readily to yield to its curative agency. Between it and pus indeed there would seem to exist an antagonism which leads to the disappearance of the latter from surfaces where it already has shown itself, and by which its occurrence is prevented in newly-inflicted wounds, in circumstances in which all former experience would have led us to expect its secretion.

Its successful employment in the following case of

* This case has lately proved fatal.

"varicose ulcers" is sufficiently encouraging:—A gentleman of large stature had suffered for fourteen years from these torments, which, for some years past, had gained considerably upon him, in spite of every attempt to obtain relief, and ultimately confined him to the sofa. The leg was enormously swollen, with an extensive, deep, and very painful ulcer over each ankle on both sides, stretching up to the thick part of the calf. The amount of discharge was something frightful, and night and day his life was rendered miserable. The daily use of croton-oil, and careful strapping, somewhat lessened the size of the limb, but nothing which could be devised would induce the healing process, until the Sulphurous Acid lotion was used as an auxiliary, when the most satisfactory amendment took place, and ere long the breaches were repaired. He is now free from pain, and is able to go about his ordinary avocations; but, as a measure of precaution, he still adheres to the system of treatment from which he derived so much benefit, having learned by experience that it would not be safe to intermit the application of the remedy.*

In "primary wounds," too, this dressing contributes materially to recovery. For twelve months past I have given the preference to it over all other modes of dressing, having been early impressed with the conviction that, under the shelter of its protecting influence, wounds would be safe from those evil agencies which engender the ordinary causes of retarded cure. Injuries received at "spinning-mills" are proverbially tedious in their progress, but

* One of this gentleman's farm-servants had obstinate "granular conjunctivitis," for which he had tried multifarious remedies. I gave him some of his master's bottle, and in one week's time a complete cure was effected.

they mend quickly under this application, "proud-flesh" being almost unknown, and cicatrization taking place with unusual facility. The following is a curious case:—A foreman at a farm, in using a hatchet, missed his aim, and came "whack" upon his own shin. The wound was about four inches long, and he was suffering great pain. I applied the lotion, which gave him immediate relief, and as long as his supply lasted, he was able to go about his work without inconvenience, the wound being perfectly clean, and the leg as free from swelling. Five days afterwards, his bottle went done, and he became lame, his leg immediately swelled, and the wound began to suppurate; but all was set right when the lotion was re-applied, and his progress was thenceforward uninterrupted. It need scarcely be remarked that this man's experience was very different from that of many others who had met with similar injuries; and but for the beneficent action of this simple remedy, he would undoubtedly have been subjected to irksome confinement for some sixteen days at shortest. In a boy, too, of four years of age, who fell upon a broken bottle, and cut his upper eyelid very severely, its effects were not less striking, for while the wound healed with unusual rapidity, the characteristic "black-eye" did not put in appearance. This child must have derived comfort from the application, for his mother told me that several times in the middle of the night she had found him out of bed, of his own accord soaking the piece of cloth in the liquid.*

Sciatica.—Professor Syme has long regarded this disease

* An instructive example of the "preventive" capabilities of Sulphurous Acid lately occurred in a horse in my own stable. One day, when starting

as depending essentially upon the decomposition of feculent matter, which has been (and may be) for an indefinite period retained in the "colour;" and, accordingly, the treatment which he has recommended, and which has often proved most efficacious, is copious "enemata," with the view of "washing out" the peccant matters. It sometimes happened, however, that, in spite of much diligence, relief was long deferred, and it was precisely in such circumstances that I tried the following expedient, which was followed by such curious results. A middle-aged slater was taken with sciatica, when, after having tried various domestic cures, I was asked to see him, on the fifth day of his illness. I found him with his left thigh fixed in a half-bent position, and recommended the ordinary mode of management. This was persevered in most determinedly for forty-eight hours, without any amelioration of the symptoms, when it suddenly flashed through my mind that decomposition and fermentation were, to say the least of it, closely allied; and having had some experience of its influence upon these

for Edinburgh, I told my groom to take out this animal for exercise upon "the sands," as I was looking forward to requiring him for a purpose, which I need not farther particularise. He having judged it advisable to give the animal "a sweat," of which he had no earthly need, proceeded to gallop him in knee-deep sand, the consequence of which was "an over-reach," the worst that I ever have had the misfortune to encounter. This accident is considered by veterinarians to be at all times a serious one, and is usually followed by heat, pain, swelling, and suppuration. Of course the animal was in the stable for two weeks; but as soon as I learned how matters stood, I had the sore dressed with pure acid, and the whole covered with gutta-percha, and the application renewed as often as to keep up a constant moisture. Nothing could be more satisfactory than the progress which was made, the case being markedly conspicuous by the entire absence of the ordinary morbid appearances, and the perfect indifference with which the animal submitted to the handling of the sore—a species of attention of which horses are usually very jealous.

processes, I resolved upon injecting 3j. S.A. in a breakfast-cupful of gruel. This was done, and directions were given to have it repeated in six hours, if no benefit resulted. I had heard nothing more of my patient for thirty hours, when, to my surprise, I met him walking, about half-a-mile from his own house. His story was that, within ten minutes after he had the clyster, he got relief, and his leg dropped suddenly upon the bed. He was able to walk upon the floor while his bed was being made, and soon forgot all his troubles. Upon my asking him how long he had retained the injection, he replied that it "was in his 'inside' yet, for, as the pain had gone, he had never thought more about it."

The use of the "spray-producer" is a very simple process, and for the last eight months I have used it daily, with the most gratifying and marked success; for while I have not seen a single case out of the great number to whom I have applied it suffer the slightest inconvenience, it has been the means of effecting cures in circumstances where such was little hoped for. A few "whiffs" directed towards the nostrils opens a "stuffed nose" within a very few minutes; and its application to the throat is pronounced to be in no case disagreeable, but is frequently compared to the refreshing effect produced by having the head shampooed. My experience of its curative influence over disease of the pharyngo-laryngeal mucous membrane may be judged of from perusal of the preceding cases; and from what is from time to time communicated to me by friends and correspondents, this mode of treatment is not less successful in their hands than in my own.

The simple operation is thus conducted:—I hold the nozzle of the instrument about six inches from the patient's mouth, and administer three or four "whiffs" to begin with; then, after a corresponding interval, during which a cough or two is given, the process is repeated, about twenty squeezes in all, which represents the injection of from forty to sixty minims of acid.* The acid should be *pure* (Brit. Pharm.)

In some instances a single trial suffices for a cure; in others, and those of a more acute character, its hourly repetition is not only safe, but highly serviceable; while in diphtheria I have known cases wherein a renewed application every fifteen minutes was exacted with impatient punctuality.

Richardson's instrument and the ordinary glass one answer the purpose sufficiently well, but the former is open to the objection of soon getting corroded, the latter to being very liable to accident, even in the most careful hands; and accordingly I contrived to have one made of "vulcanite," which works excellently well, and combines the advantages of being suited to the utilisation of any kind of acid.

The process of fumigation is a simple and homely one, but it can, nevertheless, be implicitly relied on for the gaining of many healthful and sanitary ends. Its daily use has proved it, in the case of hundreds, to be possessed of important alterative, tonic, and sedative properties, by virtue of which it has been the means of rescuing numbers from the dangers of otherwise irremediable cachexy and

* I may mention that the acid, as judged of by the odour, is not of very uniform strength, but practically this is not important.

other intractable ailments. Many have regular recourse to it for the sake of its general exhilarating effects, some even preferring it to the use of stimulants for the relief of a feeling of fatigue.

The system can be conveniently practised as follows:—Take a few red cinders on a kitchen shovel, and set this upon a stool in the middle of the room; then sprinkle “flour of sulphur” in successive small quantities upon them until the atmosphere is filled with fumes, but that not disagreeably. The process can at once be interrupted by putting the shovel under the grate; and should any inconvenience be felt, this can easily be modified by opening the door or window.

The operation may be repeated as often as is thought requisite; but my experience would lead me to prefer a *constant taint* of it in the sick-room, as being the most probable method of securing its full therapeutic effects.

APPENDIX.

James Dewar, Esq., M.D., Kirkcaldy.

KINROSS, 3d May 1866.

DEAR SIR,—In terms of the instructions of the Commissioners of Supply for this county, I have much pleasure in forwarding to you the annexed extract from the minutes of the annual general meeting here on Monday last.—I am, etc.,

RO. BURNS BEGG, JUN.,

Clerk of Supply.

EXTRACT from MINUTES of ANNUAL GENERAL MEETING of the COMMISSIONERS of SUPPLY for KINROSS-SHIRE, held at Kinross on 30th April 1866 ;—

HARRY YOUNG of Cleish, Convener of the County, in the chair.

“On the motion of Mr Brown Morison of Finderlie, a vote of thanks was unanimously accorded by the meeting to Dr James Dewar, Kirkcaldy, for the great trouble he has taken, and the valuable aid he has given, in this and the adjoining counties, in reference to the use of Disinfectants under the Cattle Diseases Prevention Act ; and the Clerk of Supply was instructed to write to Dr Dewar, with an extract of this resolution.”

RO. BURNS BEGG, JUN.,

Clerk of Supply for Kinross-shire.

MEMORANDUM by A. HALLIDAY DOUGLAS, Esq., M.D.,
F.R.C.P., Edinburgh.

33 QUEEN STREET,
EDINBURGH, 7th May 1866.

I HAVE been strongly impressed by the simplicity of Dr Dewar's process for employing Sulphurous Acid Gas as a disinfectant in the Cattle Plague. The importance of the subject demands that the plan should be thoroughly and speedily tested; but, at present, I mean to refer to the important influence Dr Dewar has observed sulphur fumigations to exert on diseases in the human subject.

At the request of Dr Dewar, I visited with him, on the 5th inst., three cases in which the patients had been subjected to sulphur fumigations for periods varying from three months to three weeks, with results which are very remarkable. In each of these cases, tubercular disease of the lungs had occasioned some of its worst effects; and, according to the account the patients gave of themselves, a marked and very cheering mitigation of their distress had thus early followed the use of the fumigation.

The first case was that of A—— C——, aged 44. He presented the appearance of broken health, but was able to follow his employment as Dr Dewar's stable-servant. He did not appear breathless, though he had ascended a long stair to see me; he had no cough, and said he had gained a stone and a half in weight.

On examination, I found the signs of disease of the right lung. The lung expanded imperfectly during inspiration, and consequently the positive indications of disease were not strongly marked. From his existing condition, however, and from the history he gave of his illness, I had no difficulty in determining that he had been suffering from tubercular disease of the lung, which

appeared to have originated in a preceding attack of pleuropneumonia.

Three months ago, he was helpless from exhausted strength and emaciation, with harassing cough and expectoration.

The second case was that of a girl, A——, aged 20, whose case may be described along with that of the remaining patient, a young woman, —— ———, aged 28.

Both patients presented the ordinary appearance observed in the third stage of phthisis pulmonalis. Both were emaciated, and had suffered from harassing cough, night-sweats, and sleeplessness. In the former, the deposit of tubercle appeared to involve chiefly the left lung; and the signs of excavation of the lung were not very decided. In the latter case, both lungs had suffered from the deposit, and the unmistakable signs of excavation existed over the upper parts of both lungs. In this case, the symptoms of the disease had existed for two years.

Both of these patients spoke to me in the strongest terms of the comparative comfort they had enjoyed under the fumigation treatment. "Their cough had become less harassing;" the "night-sweats had ceased;" and they "slept night after night for three, four, or five hours, uninterruptedly;" and "waking in the early morning, they slept again, as they had not done for months before."

These results, though incomplete, are most encouraging, and demand the farther investigation of the subject. I have accordingly taken steps for the construction of a chamber for employing sulphur fumigation in connection with The Chalmers Hospital, where I shall be able to test the remedy forthwith.

A. HALLIDAY DOUGLAS.

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Schenck & M^rFarlane, Printers, Edinburgh.

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months before."

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demand the further investigation of the subject. I have already

directly taken steps for the construction of a chamber for supplying

oxygen, in connection with The Glasgow Hospital.

where I shall be able to test the remedy further.

A. HALLIDAY DOUGLAS.

and the same has likewise been done by Mr. Halliday Douglas.

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