

Observations on the origin and treatment of cholera and other pestilential diseases, and on the gaseous oxide of nitrogen as a remedy in such diseases; as also in cases of asphyxia from suffocation and drowning, and against the effects of narcotic poisons / [John Hancock].

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Observations
ON THE
ORIGIN AND TREATMENT
OF
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AND OTHER
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AND ON THE
GASEOUS OXIDE OF NITROGEN
AS A
Remedy in such Diseases;
AS ALSO IN CASES OF
ASPHYXIA FROM SUFFOCATION AND DROWNING,
AND AGAINST THE EFFECTS OF NARCOTIC POISONS:

BY
JOHN HANCOCK,

M. MED.-BOT. AND ZOOL. SOC. LONDON, PHIL. SOC. BRIT. GUIANA,
HON. MEM. SOC. ARTS, EDIN., &c.

London:

PRINTED BY J. WILSON, GEORGE-COURT, PICCADILLY.

1831.

Observations

ORIGIN AND TREATMENT

CHOLERA

PESTILENTIAL DISEASES

GASBOUS OXIDE OF NITROGEN

Lithography in early Disasters



JOHN HANCOCK

London:

PRINTED BY J. WILSON, STATIONER AND PRINTER, 15, FLEET STREET.

1831

TO THE READER.

THE following pages have been composed during a rather painful illness, under which the author has recently suffered,—such as to preclude all avails of *learned lore* from the *book-making rooms* in Great Russell-street, and likewise to render him less capable of attending to arrangement, or to forms or elegancies of language—ornaments, indeed, to which he never aspired: he hopes, however, that the matter only, and not the manner of the performance, will be regarded by the medical profession and the public. He begs leave to state, that what respects the medical treatment, (p. 9—13,) is the result of experience, of near thirty years, chiefly within the tropics: and that which regards the use of a new remedy—the *nitrous oxide*—although founded on experiment, in some measure demonstrative, yet remains to be applied to those important purposes indicated by its known physiological properties, viz. as an antidote to the effects of *impure air*, or *epidemical poisons*.

May we not entertain a hope, that, ere long, those mystical and destructive agents shall be better understood, and that more efficient means shall be devised for counteracting their baneful and desolating progress? To these momentous points, it has been the humble effort of the writer to draw the attention of the liberal and enlightened members of the medical faculty—of all real philanthropists and patrons of science.

He is aware that narrow-minded critics are ever prone to condemn whatever they find discordant with their preconceived opinions, acquired at school:—he writes not for them,—courts not their favours, nor deprecates their censures, but desires to submit this small essay to the consideration of men of candor and experience: the criticism of such judges he will regard with deference.

N. B. This pamphlet was chiefly penned during the months of June and July last; it was then submitted to some friends (and soon after to Mr. Sherwood,) who advised its immediate publication; but an outline of the plan of treatment having already been printed,—and numerous treatises coming out on the subject of Cholera, it was thought better to wait, for a time, the progress of discovery, in a matter which so intensely engrossed the public mind, and the researches of scientific men. A review of the various statements since published, tend but to confirm opinions derived from previous experience, and to prove that typhoid or adynamial maladies of all climates, are, at the onset, controllable by the same measures, or on the same general principles. The nitrous oxide gas appears to have been employed, or proposed at least, some years since on the Continent, in certain chronical affections, as epilepsy or palsy; and a hint has recently been given (see *Lancet* of 20th August) by a gentleman abroad, for its trial in Cholera: we have reason to hope, therefore, it may, ere long, receive that regard which it appears to merit, as a remedial agent.

London, Oct. 1831.

SYMPTOMS OF CHOLERA.

Notwithstanding what is said at page 9, I may here briefly notice a few of the more ordinary symptoms which characterize Cholera Morbus (C. Spasmodica,*) for the instruction of those unacquainted with it. From all I have witnessed and read on the subject, it appears evident that the disease is the same, in genus and species, in every part of the world, although, occasionally, certain sets of symptoms will predominate. It would seem, by late reports, that in Russia, the disease shows a greater tendency to putrefaction—I should rather say, perhaps, to a stagnation of blood in the veins and the sub-cutaneous tissues, as appears by the rapid change of colour of the skin. There is one material circumstance, however, which I have not noticed, in the symptoms, as given by writers on Indian or Russian Cholera:—in South America, we have often observed, that, some days after a white flux (fluxo blanco) had annoyed the patient,—a cathartic dose, with opium, &c., (see p. 11,) would expel, not only bile, but copious stools, partly in hard masses or *scybalæ*. This I ever regarded as the consequence of a spasm of the bowels, retaining the feces, or a want of the power of expulsion, till relieved by an antispasmodic, as at times observed in dysentery, and more especially in spasmodic colic, or dry belly-ache,—a disorder very prevalent in those climates.

The more usual Symptoms.—Although, in its more fatal forms, the attack is scarcely anticipated by any premonitory signs, yet, in ordinary cases, the patient is previously af-

* More properly termed, perhaps, Cholera *syncopalis*—fainting, of συκοπτω, to cut off, or strike down.

fectured with a degree of lassitude, sadness, and apprehension of evil, with slight cramps in the legs, and diarrhoea, when, after a longer or shorter period, the disease declares itself less equivocally, by nausea, vomiting, anxiety, griping pains and spasms in the stomach and bowels, liquid stools of various appearance, vertigo or dizziness, oppression at the chest, fainting or asphyxia; pulse small and variable, or intermittent. There is much of anguish expressed in the face and the feeble moans of the patient; the countenance, and all the soft parts, appear shrunk, and more or less of a livid hue: the temperature of the body is, from the first, diminished, as denoted both by the sense of touch and by the thermometer: a deadly coldness gradually pervades the whole frame. After some hours, a degree of reaction and fever occurs, unless the patient expire in the cold stage, or unless, by prompt measures, the disease be early arrested. The fever, not always well marked, of no determinate duration, is mostly of the low nervous kind, accompanied with dull pains over the body, stupor and heaviness, and gradually remitting as the powers of life decline. The breathing is short and laborious, with cramps and swooning: perspirations, cold and colliquative, precede the fatal termination.

The symptoms are diversified by the habit of the patient, by climate, condition of the atmosphere, and intensity of the latent cause; and, as justly observed by Mr. Orton, (on Cholera), “the disease presents an extreme variety, and, perhaps, unparalleled number of symptoms; and the severe form of the disease is chiefly characterized by diminished action and suppression of function.”

GENERAL REMARKS.

A PESTILENTIAL state of the atmosphere will produce diseases, generally esteemed contagious, in which debility and putrid symptoms are most predominant, as yellow-fever, cholera, typhus, &c.,—all of which, under divers forms, arising from similar depressing powers, require a mode of treatment similar in principle, and differing little in detail.—It is not true, as usually pretended, that the most precise pathological discrimination is necessary for directing the treatment of such disorders, as if each symptom required a specific. This mischievous kind of charlatanery which now inundates the medical press, results from a vain shew of learning and discrimination. Although differing from a certain learned physician in the opinion, that the whole art of physic might be placed on a single sheet of paper,—yet I consider there is nothing more pernicious than this reigning affectation, by which the art of physic is perplexed and kept in a perpetual chaos, under the vain pretence of extreme accuracy and refinement,—in a science too, altogether obscure, without a base, and of which the first principles are misconceived or quite unsettled.

Small-pox and Measles, which are really contagious, produce high *excitement*, *reaction*, and *fever*, as do also local inflammations,—and that from similarity of cause,—namely, *partial* lesions.

Diseases produced by Mephites, or a deleterious atmosphere, as the Plague, the worst forms of Yellow-fever, or malignant Typhus, Cholera, &c., are marked greatly by

languor; faintness, and *depression* of strength,—the reason of this collapse or *non-excitement* is, that the *whole frame* is equally paralyzed,—the polluted air, in a manner, poisoning the whole mass of blood.*

By this direct attack on the principle of life, the whole body is enfeebled, and the blood, now altered, in a measure stagnates—ceasing to afford its wonted stimulus to the solids. The case is very different in local congestion or inflammation—when partial lesion or loss of tone occurs,—the blood being, in this case, driven into those parts whose contractile power and resistance are diminished:—the degree of excitement will be proportionate to the *local injury*, and to the *constitutional strength* and *plethora*. Disease, in this form, requires chiefly that the

* It is when *certain parts* only, losing their wonted tone and resistance, as by *cold, blows, &c.* suffering distension from the pressure of an accumulation of blood, constituting *local inflammation*,—that great constitutional reaction occurs. It is *local debility*, not *increased action*, as absurdly maintained, which is the cause of inflammation: the weakened part wants that contractile power which is necessary to transmit and propel the fluids along their wonted channels,—the muscular fibres are relaxed, and the vessels being thinned and distended by the pressure of blood, must, therefore, throb more sensibly, or repeat more distinctly the pulsive motions of the heart,—and this it is which gives the idea of increased action in the part,—whilst the topical pain and nervous disturbance, especially if a plethora be present, goes on to excite the *system to reaction*,—which tends to equalize the distribution of the fluids. The accelerated respiration brings, perhaps, more vital air to the blood in aid of the natural effort; for the heat of the body appears, in general, to bear a near ratio to the frequency of respiration, or rather to the *quantity of air respired*. These opinions, however, (which I had stated in the *Guiana Chronicle*, in 1824, and in some previous correspondence) will be more fully discussed in a subsequent paper,—as being of primary importance in forming some idea of the nature of disease. I will only observe here, that the nature of inflammation has never, to my knowledge, had a rational explanation; we, therefore, need not be surprised at the obscure and backward state of Medical Science;—when the foundation is bad, the whole superstructure must be so too.

force of circulation be diminished, by bleeding and laxatives, abstinence and diluents,—with the use of sudorifics, counter irritants, &c.;—but, in the former case, when universal debility, or putrid symptoms predominate, the warm sudorific and alexiterial remedies, constitute our chief and almost sole reliance,—and we find it requisite at times, when there is great prostration of strength, besides the use of opiates, to employ also alcoholic stimuli; and *that*, to be most useful, and retained by the stomach, should be done without delay.

Some are opposed to an early resort to remedies of the exciting kind, but they do not consider that *the most fatal cases are those attended by least excitement or reaction*,*—and in *such*, we find, that *the only successful method lies in producing such reaction*.

MEDICAL TREATMENT.

As the symptoms of Cholera Morbus are sufficiently understood by every intelligent practitioner, and differing, as do the symptoms, at various times and places, in numerous unimportant details, I shall pass them over here, and proceed to speak of the mode of treatment which I have found to be most successful under all its varied forms.—For a condensed general view of the subject, I may here give the substance of a communication of mine, in May last, in reply to one from Sir John Sinclair,—an abstract of which, the

* For an example, in illustration, we may take the following from the *Report on Cholera*, by Mr. Scot, Secretary to the Madras Medical Board:—
 “A frequent variety—the worst of all—is that which is noted for the very slight commotion in the system, in which there is no vomiting, hardly any purging, (perhaps only one or two loose stools,) no perceptible spasm, no pain of any kind; a mortal coldness, with arrest of the circulation, comes on from the beginning, and the patient quickly dies without a struggle.”

worthy Baronet was pleased, shortly after, to publish along with his "*Medical Hints*."*

I wish to point out a fatal error with respect to cholera, yellow-fever, &c., which too many fall into:—mistaking the effect for the cause—they consider it requisite, as a preliminary step, to evacuate the bowels, to get rid of the *acrid bile*, &c.—thus losing that point of time in which, alone, the disease might be arrested *in limine*.

It happens, not unfrequently, (from the presence of deleterious miasma, not appreciable by our senses, or even by the nicest instruments,) that Cholera, Yellow-fever, Dysentery, &c., *commencing with prostration of strength* and collapse, will, as in the true plague, destroy the patient within a few hours from the sensible invasion; the disease, for some time perhaps, existing in embryo, previously to the manifestation of any symptom.

Instead, therefore, of the practice of evacuating, diluting, and *waiting for a crisis*, my plan is, to arrest the further intrusion of disease by the *immediate administration* of the most potent sudorific alexipharmics, combined with cathartics, more or less active, as the case may indicate; opening a vein at the same time, and abstracting a due portion of blood—proportionate to the plethora, or signs of vascular congestion, and to the *habit* of the patient,—so as to give *celerity* or *freedom* to the *circulation*.

If, from the stimulants employed, the excitement runs high, the cold affusion† will be found extremely beneficial

* "Dr. Hancock's plan of curing the Cholera," l. c., p. 12.

† I may here remark, that cold water, dashed over the entire surface of the body, is the most effectual of all known antidotes for removing the narcotic effects of excessive doses of opium (or of alcohol);—I have known persons thus suddenly roused from the most profound apoplexy.—And, in

and grateful—and it should be, in a great measure, regulated by the patient's feelings. If rigors, or cold shivering, are induced, we recur to the warm or vapour bath. Such alternate employment of heat and cold has often effected very signal cures in those fatal distempers, as experience has fully proved—and that, too, in the worst forms of cholera and *vomito prieto*, in Venezuela and Spanish Guiana, in 1815-17. In cases attended with visceral inflammation and fever, as well as those of collapse—repeated *frictions, with capsicum and vinegar*, over the region affected, or rather over the whole body,—have been attended with extraordinary success.

To be more explicit—at the onset I give a dose, consisting of camphor and opium, two or three grains of each; cathartic extract, calomel, sulphate of potash, of each ten grains; the whole is ground down, formed into soft pills with Castile soap, and given to the patient in syrup or jelly,*

a case which came under my observation, when nothing else could rouse the patient—after having swallowed several ounces of laudanum—he, by these means, (and *pepper frictions*), recovered from a violent Traumatic Tetanus. Here, the Tetanus was removed by the opium, and the effects of opium by the cold affusion. This case was published in the *Weekly Free Press* of Feb. 2d, 1830. The method ought to be generally known, since this drug is so frequently resorted to for the purpose of suicide.

* The above is the common dose, or that usually found to answer for adults,—to be regulated, however, by the judgment of the medical attendant,—according to the urgency of the case, the habit of the patient, and, especially, by the *effects* produced;—a rule, indeed, which should ever be carefully attended to in the administration of remedies. I have often found still larger doses of opium to be necessary. A valuable addition is powdered capsicum, about four grains, but this is seldom found genuine here: for persons accustomed to its use, the dose may be increased to six or eight grains. Of all remedies ever tried in Spanish America, this recipe, however unchemical, has proved the most effectual, and not only in Cholera, but in vomito prieto. It has the advantage, too, of being retained on the stomach when other medicines are rejected,—by its anodyne, antispasmodic

a vein also being opened.—The patient then takes an infusion of Angustura bark, or sage tea, with lemon juice, sugar, (and brandy, if the stomach will retain it;) and is placed, for fifteen or twenty minutes, in a vapour bath, (with some aromatic herbs bruised and thrown in); his skin being then chafed with a coarse towel, he is covered warm in bed. Glysters, with salt and oil, are given, as may be necessary, to free the bowels. Further treatment is seldom required, except a due perseverance in this, till signs of returning health may point out the use of mild nourishment; continuing the use of sage tea, good barley water, chicken broth, or the like. A warm perspiration is thus induced, and the bowels are more completely, though gently, exonerated than by cathartics given alone. The main conditions which constitute

power, presently tranquillizing the perturbed organ; and in the few subsequent efforts to vomit, the mechanical weight of the pills precludes their repassing the cardiac orifice. The entire dose, involved in Guava jelly, was usually swallowed at once. I have, at times, substituted the white of egg as a vehicle, and to me it appears to be the best possible,—most perfectly covering the nauseous bitterness. It had been considered as anti-emetic, which suggested its use for the purpose just stated.

Should the patient have lost the power of swallowing, the opium only, or sixty to eighty drops of laudanum must be thrown into the intestine, mixed in three or four ounces of starch mucilage, broth, or plain water to avoid delay; giving no other remedy till the patient is able to swallow; but using diligence to restore the natural heat by frictions and other external means. It is necessary to give this glyster in a *very small* form that it may be *retained*—*this requires particular attention*. This method, indeed, (*beginning* with the injection), is the most eligible, whenever there is much irritability of stomach or vomiting. In no case of this sort, commencing with great prostration of strength, should evacuants precede the use of cordials. Flannels should be applied to the stomach and bowels, wrung out of a hot infusion of aromatic herbs—as mint, sage, rosemary, rue, wormwood, of each a handful or two; this will check the efforts to vomit, and assuage the pains. The same, or hot blankets, should be applied to the feet and legs, when, as usual, affected with cramp and cold.

disease, *irritation and spasm*, are thus timely arrested before the vital powers are sunk beyond recal. (See p. 47, note 1).

When the disorder is prolonged, the muriatic acid withal, is a useful medicine, especially when the tongue is furred, and there is a foetid halitus.

Effervescing draughts are serviceable against the irritability of stomach. Sherbets and lemonade, are in this, as in other febrile and putrid distempers, equally useful and grateful to the patient—notwithstanding all theories regarding the predominance of acidity in the *prima via* and the blood:—either acids or alkalis, however, (or both,) may be taken, as found best to agree with the stomach, in particular cases. Common salt and lime juice have been freely employed, after Dr. Wright's method—and, with very great benefit, in camp dysentery, cholera, and the vomito.

The foregoing method, with little variation, will, also, generally be found most successful in spasmodic colic and enteritis, in the malignant forms of typhus and dysentery, and, doubtless, in the plague.*

NOTICE OF CERTAIN PREVALENT OPINIONS.

We are informed that *acetic acid* has recently been found in the blood of those who have died of the Cholera at St. Petersburg. Such anomaly, however, should be regarded as an *effect* and not as a *cause* of the disease.—Physicians have been too long beguiled by the acid and alkaline

* The present Russian epidemic appears, from reports, to be closely allied to the Levant plague—probably requiring little or no distinction in respect to the treatment. A method similar to the preceding, has, I am told, proved of the greatest avail in the malignant *winter flux* and cholera of North America. And it is stated, in the papers of the present month (July), that Dr. Mahir, in Poland, had recently recovered from a hopeless state of Cholera, upon the use of *large doses* of opium,—such facts tend to show, that the European disease may be arrested by the same means as I had found most successful in Spanish America.

pathology, still to allow it much influence on their practice or opinions.

The prevailing fashion is, to impute these disorders to a fault in some particular organ—as the stomach,—or the *liver*; to a faulty, redundant, or altered *secretion* of the *bile*: it is a partial view which leads to such conclusions;—the natural outlets, or *prima via*, must, as the *common sewers*, give exit to the morbid discharges of the *whole system*—the pores of the skin and exhalent arteries being shut, the fluids separated from the body, (and which seem rather like the drainings from a diseased mass than natural secretions,) must go off by some of the natural outlets. We should not thence conclude that the *channels* and *secerners* are the parts alone in fault, but that they suffer in common with other parts of the body;*—the practice may by chance be right, but the motive is mistaken, when remedies are ordered with the view of acting on certain parts only.—It is not by a direct impression on the stomach, bowels, or kidneys, but by an operation on the *whole system*, that emetic tartar, mercury, squill, &c. respectively produce their effects—being, doubtless, conveyed through the circulating fluids:—their specific effects, too, may be obtained by injection into the veins. Nevertheless, the loose and less resisting texture of the liver and many internal parts, render them more subject to lesions or derangement from debilitating causes, as concussions, sudden transitions from heat to cold, &c.—those organs of course being less able to contract and repress the flow of blood impelled into them by the systole of the heart and the arterial impulse.

* It is true, certain symptoms of Cholera, as vomiting, purging, &c. may arise from local irritation—of the stomach, liver, or intestines,—as, from hurtful food, or poisons, and this is often denominated *Cholera Morbus*: I have seen such cases in London,—(and once, in my own person,)—they scarcely belong, however, even to the genus of distempers under consideration.

To adduce an instance how the faculty too often suffer themselves to be imposed on,—speaking recently with a medical gentleman on Cynanche Maligna, he observed, that it must certainly be infectious, for he had known it to run through a whole family :—it did not occur to him, that the same air of the house which assails one person may equally affect the whole. I have been, occasionally, (especially in the year 1804, in Demerara,) in a manner, drenched with the *black vomit*, ejected from the sick and dying sailors—yet, neither myself nor the attendants took the disease,—unless it were new-comers, under the same exposures. I consider the regulations of Quarantine to be absolutely useless, the mere offspring of ignorance,—founded, not in reason, but in fear and delusion. It must be allowed, however, that there was some cause for it prior to the introduction of vaccination. We have too often been compelled to witness the unseemly apprehension and timidity of our brethren,—stopping their breath and feeling the pulse through a glove, a napkin, &c., from fear of contagion :—several instances, however, tended to show that those timid persons were more liable than others to take the disease—and that their patients, also, fared worse ;—such fatal results, indeed, must ever attend the misconceptions of the contagionists. It was observed at this place (Demerara), that the disease prevailed with the greatest mortality in those vessels which lay direct to leeward of the marshy and ill-drained land of the coast, abounding with numerous ditches and stagnant brackish waters.

According to the vulgar opinions, and those of authors, the plague is ever *introduced by contagion* from *some other* port or city ! It is never allowed by the *inhabitants* of any place, to originate in their own country—this reputed foreigner, *aliquid, sine sede*—is, at any two places where more prevalent, a continual source of mutual reproach :—
 “ It is generally brought into European Turkey from Egypt,

where it is very frequent, especially at Grand Cairo."—(*Encyclo. Brit. art. Plague.*) On the contrary, in Egypt, Volney was persuaded "that it really originates from Constantinople, where it is perpetuated by the absurd negligence of the Turks."—*Travels*, p. 254.

In 1656 a most destructive plague entered Naples—"brought from Sardinia," (as a matter of course introduced,) by a transport: it is said to have carried off 400,000 inhabitants. The greatest consternation prevailed, and the terror of the people increased their superstition—the streets were crowded with processions—and a certain nun (type of Johannah Southcote) having prophesied that the pestilence would cease on the building a hermitage, for her sister nuns, on the hill of St. Martin, the edifice was commenced with the most ardent zeal. Persons of all ranks and professions striving who should perform the meanest offices, loading themselves with brick, lime, sand, &c.; their violent agitation, and the increasing heats, diffused the malady through the whole city, and the streets and stairs of the churches were filled with the dead; the number of whom, for a time, in the month of July, amounted daily to 15,000. The infection desolated the kingdom. The general calamity was increased by insinuations, that the distemper had been intentionally introduced by the Spaniards; that there were people in disguise who went through the city sowing *poisoned dust*. This enraged the populace to insult the Spanish soldiers. To pacify the mob, the Spanish Viceroy had a criminal broke on the wheel as a disperser of the dust. A violent and plentiful rain falling about the middle of August, the distemper begun to abate, and the physicians, on the 8th December, made a solemn declaration, that the city was entirely free from infection.

—I have abridged this from the *Encyclo. Brit.*, as it serves

to give some idea of the blind fanaticism and phrensy which result, even amongst intelligent people, from a blind belief in *contagion*; and because it reminds me of the effects of mephitic air on rats, when a number of them, in the experiments alluded to at p. 21, were suspended in a basket over the lethal fluid: they began scrambling, climbing, and falling successively,—knowing little less, perhaps, than did the Neapolitans, what was destroying them:—nay, by their endeavours to ascend, seeming to show more of instinctive sagacity.

Contagion and Pestilence distinguished.

From the confused ideas which prevail in relation to *Contagion* and *Pestilence*, these terms are in general used synonymously,—it is therefore necessary to observe, that by pestilence I mean those malignant distempers, which originate, as from analogy I judge the Plague ever does, in a *polluted atmosphere*, and not from *contagion*, *infection*, or from any *specific animal poison*.

Contagion and pestilence are confounded, because they both act upon the multitude unseen; the greater the number of people crowded together, whether well or ill, the more is the air contaminated.—This brings disease, by perverting the direct pabulum of life, and the result is ascribed to contagion or infection—*i. e.* to a virus, or to emanations from the human body.

The effluvia of small-pox may, doubtless, be long retained in beds, clothing, &c.—such articles, too, being saturated with the corrupt air of filthy places, as of ships, jails, &c., may likewise retain a febrile miasm,—capable, perhaps, when conveyed elsewhere, of exciting disease in persons exposed to breathe their effluvia,—especially if predisposed by other depressing causes: but then, it goes no further,—if the air of the place where the goods are

opened be otherwise healthy. If the air be already depraved, it may thus receive a temporary, local aggravation, or augmented pollution.—A long course of observation and experience, has fully convinced me, that neither Cholera, Dysentery, Yellow-fever, or other forms of Typhus, are infectious, in any other respect than as just mentioned:—this surely is not *contagion* or *infection*, although usually mistaken for it.—Agreeably to the common acceptation, I use these terms synonymously.

OF NITROUS OXIDE AS A REMEDY.

Toxicology has received great attention and improvement of late,—in respect, however, to individual cases only, or of poisons taken into the stomach,—whilst those evils, infinitely more destructive—the *epidemical poisons*, remain uncontrolled—I may say, unheeded in their secret operations, destroying mankind by thousands.

From experiments I made on animals some years ago, I was led to the conclusion, that Pneumatic Medicine, which had been much discussed,* had yet, not been applied to those important purposes, which a due consideration should point

* The excessive hopes, for a time indulged in the virtues of certain gases, of oxygen chiefly, and the consequent disappointments which ensued, have had the effect to sink them in the estimation of the faculty, far below their real value as remedial agents:—we have reason to believe, however, that some of the deleterious gases are available as remedies of great efficacy,—as sedatives in over-excited states of the system—and in pulmonary disorders especially. See a case in point, related in the *Lancet*, No. 849, of a consumption cured by the foul air of a ship's hold; and an interesting notice of the efficacy of *vapours* issuing from the Pyrmont springs and caverns in their vicinity, by Dr. Seip (in *Phil. Trans.*, No. 448, and long before this aeriform fluid became known as *carbonic acid gas*)—he found it to remove cough and defluxions on the lungs; and, *externally*, as a bath to the lower extremities, it seems to have proved an extraordinary stimulating sudorific,—most efficacious in rheumatism, gout, &c. “There is not under heaven,” he says, “a more short and easy method of raising a sweat, for after a few moments in this vaporous cave, the whole body flows with sweat.”

out—as affording the most rational hopes of utility—and with reference especially to aerial poisons or disorders arising from the breathing of mephitic exhalations,—in short, that, *poisons acting on or through the organs of respiration, might, with most effect, be combated by antidotes applied through the same medium*, and thus meet the enemy upon his own inroads.—Oxygen gas had been proposed and tried, by Dr. Beddoes, and others, in consumption and several disorders, in which a deficiency of this principle was supposed to exist in the blood, but, on the whole, without satisfactory results. Nitrous and other fumigations have long been used for preventing contagion, or disinfecting ships, jails, and hospitals—and with variously reported success.—These disinfecting agents, so called, are found to destroy offensive smells—it is hence, perhaps, the idea has arisen, that they must destroy or neutralize pestiferous effluvia,—their efficacy, however, is doubtful even as mere *preventives* of infection—and nothing more is expected of them. These are all of the deleterious kind—as sulphureous,—nitrous vapour, and chlorine. Notwithstanding the encomiums by Dr. Carmichael Smyth, it was long since asserted by Dr. Mitchell, of New York, that septon and the nitrous acid vapours even promote contagion: Dr. Trotter, and others of equal experience, have found it of no avail. But why not resort to those agents which may operate, not merely as prophylactics, but as real *antidotes* to the evil already induced?

It may be owing, perhaps, to the small opportunities I possessed (during a lengthened residence in tropical climates) of reading periodical literature—but I have never learnt that experiments have yet been made, or even suggested, for the trial of an agent, which, from its physical properties, seems to promise more than all others, to be applicable as an antidote, to the poison of a mephitic or polluted atmo-

sphere — which perverts the blood and breaks down the vital powers, — the remedy to which I allude, is the GASEOUS OXIDE of NITROGEN.

From whatever the pestilence originate—whether in the earth, water, or otherwise, it exists in the air we breathe; its effects are adynamic, and depressing to the living powers. This being fully known and established, requires no arguments in proof. Should we not then seek the antidote in an opposite condition of the air?—in an agent capable of counteracting the baneful effects of *malaria*, or mephitic vapours?—These simple propositions, I presume, no one will deny.—The *gaseous oxide of nitrogen* appears to offer the most appropriate agent for this purpose,—as the principle most directly opposed to the effects of a deleterious air; and from what I have seen of its operation, I cannot entertain a doubt that, when fairly tried, it will prove the most important antidote and remedy in pestilential disorders, and especially adapted to their more mortal forms,—or those which attack with prostration of strength, collapse, and sinking of the vital functions. Its powers are manifested by an operation on the animal economy, eminently distinguished from those of every other chemical or physical agent;—it removes depressing passions, melancholy, and fatigue;—rousing all the faculties, mental and corporeal, producing a flow of ideas, vivacity, and muscular vigour—differing, too, from all other stimuli in its *permanency*—leaving no subsequent languor or depression—and, in not losing its effects from repetition, nor leading to any ill consequences from habitual use.

The vivifying and alexiterial powers of this gas have been described by Sir H. Davy, by Wedgewood, and other distinguished philosophers; all of whom bear testimony to its extraordinary invigorating powers, as exalting the vital functions to the highest, and that more perma-

nently than any other stimulus; acting in such manner, in short, as we may consider directly opposed to the effects of a sedative or deleterious atmosphere—as marsh effluvia, terrene exhalations—or the malaria of southern Europe, which bears on its wings disease and death. I have personally experienced its restorative effects after breathing foul air,—and its great efficacy in swoonings and nervous depression; and having produced asphyxia in rats and other animals, by exposure to corrupted air, in vats of foetid cane juice, containing other vegetable and animal refuse,—exhaling, probably, carburetted and sulphuretted hydrogen—they were presently restored by injecting the *nitrous oxide* into the lungs. The same results were obtained on others that were recently *drowned*. It is needless to detail particulars here, as others may at any time repeat experiments of this sort, which alone can verify the results. There is perhaps no better subject than the rat for this purpose,—its aliments are the same as those of man—its poisons and appropriate antidotes equally so. My experiments were roughly made—the gas received into a bladder to which a bone tube was affixed. The tube being inserted at the nostril—some of the gas usually entered the stomach,—and I found the effect augmented, when also injected into the intestines.*

The symptoms produced by inspiring carburetted or sulphuretted hydrogen are remarkably similar to those which attend the more deadly forms of Cholera and Yellow-fever.—An interesting account of it is given in Dr. Christison's valuable work on poisons.—“The symptoms, in cases where the vapours are breathed in a state of concentration, are sudden weakness, and signs of ordinary asphyxia,—together

* I had also intended to try the effects of a mixture of nitrous oxide with additional oxygen—I have hitherto neglected it,—yet the experiment seems worthy of attention.

ther with giddiness, coldness of skin, pulse feeble and irregular, sickness, cholic, pains ill defined, irritation of stomach and bowels, followed by spasms of the trunk and extremities, &c.”* The symptoms of course are variously modified according to the intensity of the cause. Similar effects are produced by irritating poisons, and from the use of ices and cold water in hot weather. In these instances the acrid sensation in the throat and fauces precedes the vomiting, which is not the case in Cholera.

Dr. Parr, speaking of the singular effects of the nitrous oxide, says—“To what these effects are owing has not been ascertained. A slight reflection will show, that though life be sustained by *oxygen*, yet this air is not proper for breathing for any continued period. The pleasure produced by fresh air does not arise from the oxygen, for it is not increased in proportion to the quantity breathed.”† And he observes, that the nitrous oxide had not, to his knowledge, been applied to any medical use.

By means of this gas, I presume, the corrupted atmosphere of a room may be presently rendered salutary and invigorating—both prophylactic and remedial,—not merely on the principle of *disinfecting* or *neutralizing contagion*, but by a positive regenerating property, that may be raised or lowered at will:—a moderate impregnation with the alexiterial gas, may be sufficient as a defence, or preventive of infection,—and an increased dose as a remedy or antidote, (conjoined with other appropriate means,) when deranged function has already occurred. Such resource might even be material, although it were only to arrest the morbid cause,—the corrupt or vapid air, which would otherwise continue to operate against the sick.

* P. 590 and sequel. And Hallé's *Recherches*, sur le mephitisme des fosses d'aisance.

† Parr's *Med. Dict.* vol. i, art. *Azote*.

I judge it might be equally useful in cases of poisoning by opium, and the numerous class of sedative or narcotic poisons, as rousing from the lethargy induced, and especially if assisted by the cold affusion. It is also highly worthy of trial in various cases of apparent death from *suffocation* and *drowning*. (See p. 21.) And with such view, I would beg leave to recommend it to the attention of the Humane Society, either pure, or mixed with oxygen.

This gas is easily produced by heating the nitrate of ammonia in a proper vessel over a coal fire or a lamp, till the vapour begins to rise, (see p. 48,) and when properly cooled, the patient may inhale it.—It is necessarily implied, that energetic remedies may prove hurtful by excess—with this, therefore, as all others, we should be guided by the effects produced, and not by stated doses. In extreme cases, where the patient has lost the power of inhaling, as in drowning for instance, the gas should be injected both into the lungs and the intestines.

EFFECTS OF IMPURE AIR, AS PRODUCTIVE OF DISEASE.

It is not my purpose to indulge in speculative disquisitions, but it may be remarked, that those countries bordering on the Levant, and most frequently visited by the Plague or other similar pestilence, abound also, more than most others, with mephitic exhalations and subterraneous fires, and that, too, from the earliest records:—besides those at present known, as the Mofeta at Naples, exhaling carbonic gas,—was that in Celicia, noticed by Homer; which, from its mortal and foetid air, was called *Cubile Typhonis*, and *Specus Corycius* (probably sulphuretted hydrogen)—as, also, the *Mephitis of Hierapolis*, seen and described by Strabo. (Lib. 13.)—How far the fatal epidemics of those parts may depend on such exhalations, and

whether these have connexion with the volcanic or subterraneous fires, are matters unknown to us.

Yet, there are many instances on record in regard to pestilence, which indicate its dependence on terrestrial changes, or those extensive phenomena which pervade the bowels of the earth. That dreadful plague which ravaged the Roman Empire in the reign of M. Aurelius, was followed by earthquakes and inundations. Silent emanations may long precede great convulsions of the earth, or might even preclude them.

A subtle gas or vapour has, at times, been observed to issue from Mount Etna,—and these *respiros* of the mountain are regarded as the precursors of an approaching eruption;—the vapours thus exhaled are said to be, and, doubtless, are, excessively noxious—whilst those rising in explosions are thereby decomposed:—as the evolution of electric matter, or *thunder*, is said to *purify the air*.

It is much to be feared that the Cholera will be greatly aggravated in Poland and the northern parts of Europe.—We find that when pestilence once enters the *seat of war*,*

* Numerous instances of this sort might be adduced.—The desolating plague or pestilence which visited Britain about A.D. 430, immediately followed the irruption of the Picts and Scots into the southern parts of the island, and was said to have swept away most of those who had escaped the sword. It appears, indeed, that Britain more frequently suffered from plagues in former times, when she had no commerce or ships for the importation of this commodity—*contagion*.

The ravages of pestilence appear to have been greatly modified by the degree of attention paid to cleanliness and ventilation, and the removal of mud, filth, and the fomites of disease.—This is strongly corroborated by the melioration which has taken place in the state of health (in regard to Yellow-fever) in Philadelphia and New-York, where sad experience has inculcated these truths, and where, happily, the bugbear of *imported contagion* seems to be expiring. Unfortunately, this paralyzing hydra—the *contagion* or *infection* of pestilential maladies, impedes researches into their real origin and a due course of prevention,—the sick are deserted and left to perish, and the most disastrous consequences ensue.

or besieged places, it often becomes very mortal ;—this I have seen demonstrated during the revolutionary struggles in Spanish America, —and instances in proof of the same are not wanting on the records of history :—the plague of Athens, for instance, one of the most destructive ever known—happened during the siege of Attica by the Peloponnesians and their Allies, under Archidamus, who, having encamped, laid waste the country around them. This happened about the second or third year of the 87th Olympiad :—and it is not unworthy of notice, that the devastating malady which now pervades the north of Europe, bears, in respect to its progress at least, a striking analogy to this memorable scourge, recorded by Thucydides, —of which I may here give a brief abstract.—It originated in that part of Ethiopia that lies above Egypt, and thence proceeded into Egypt and Lybia, and a great part of the Persian Dominions. After visiting Lemnos and many other places, it suddenly broke out amongst the Athenians, which caused a report that the Peloponnesians had poisoned the wells.—So great a mortality was never known. The Physicians being most exposed, and not knowing its nature, were swept off with the rest.—Supplications were made to the Gods, Oracles consulted, &c., but all proved equally fruitless.—The year had been healthy, and exempt from other disorders, but if any one was sick before, of whatever complaint, all his ills were converted into this: those in health were attacked suddenly, and hurried down to death. The symptoms were various—heat in the head, inflammation in the eyes, breath disordered and offensive, sneezing and hoarseness,—the pain descending into the breast, attended with cough, a vomiting of various kinds of bilious matter, with vast anxiety; many were seized with hiccup and convulsions: the skin was not very hot to the touch, although the patient felt a

burning heat, which urged him to take excessive draughts of cold water, and plunge into the pools. There was forgetfulness, with great sadness and despondency.—Such was the calamity which befel the Athenians, whilst the enemy ravaged the country without.—Funerals were disregarded, and their streets and temples were piled with the bodies of the dead and dying.

It would seem then, from what history furnishes respecting that dreadful malady, that, like the one which now ravages the European Continent, its line of march lay along the high road of inland commerce of those times—and was hence supposed to be propagated by human contagion;—although the more correct mind of Lucretius enabled him to deduce a more probable origin. “This disease,” says he, “either came in the air, or arose from the earth,” &c. That the fomes of such distempers *do arise from the earth*, and are variously modified by the winds, by cold, heat, and moisture, producing Typhus, Cholera, Plague, &c., there can be no doubt. It is observed at the military hospitals in the West Indies, that those persons lodged on the ground floor are much more liable to attacks of Yellow-fever, Dysentery, &c., than those in higher situations; and the same has been observed of the Yellow-fever of Spain and Gibraltar.—Certain spots are found to be peculiarly productive of disease,—especially saline, muddy shores and ditches, which have often been recognized as the emunctories of sulphuretted hydrogen and other noxious gases. These terrene, or terro-aqueous exhalations, acquire additional force from incidental circumstances, as the decomposition of organic matter, and the various sources of uncleanness in a crowded population.

A pestilential air subverts the vital powers,—by depriving the blood of its pabulum,—the remedy should first be sought in the most direct stimulant restoratives; then sudorifics, counter-irritants, &c.

Vast importance was once attached to the antiloimic, or disinfecting fumigation of Gaubius ;—this, like most other remedies, becoming obsolete, has been successively revived under different names—as the oxymuriatic fumigation of Morveau,—and more recently under that of chlorine, which is now represented by some interested individuals as a new and important discovery—of great powers against the contagion of Small-pox, Typhus, Cholera, &c.!—as if these diseases were all equally propagated by human effluvia. From experiments made on the Continent by Hébréart, it is represented as a very powerful irritant, and to produce inflammation of the lungs and bronchiæ. It is said to have caused the death of an eminent French Chemist, who, from attempting to breathe it, fell into a consumption. The nitrous acid vapour is a still more acrid poison.

Very different are the effects of a deleterious air or miasmata,—more mild and more insidious, it insensibly undermines the constitution—breaking the crasis, or lowering the stimulus of the blood, and the tone of the vital organs,—the fluids in a manner stagnating, in those parts which have least contractile power,—causing heat and pain in such parts, and more or less febrile reaction through the whole frame,—at least, when particular organs or parts of the body suffer beyond the rest ; for, at times, its effects are more general, pervading the whole system ;—in this case, the debility being equalized throughout, the blood is not, from *local* relaxation, forced into particular organs, and no part being overstrained by a pressure of blood, there is little pain experienced ; the patient's sufferings are less in this case, and, in general, sooner terminated ;—he sinks, not from the harassing effects of reaction and excitement, but, as it were, from a direct extinction of the living principle ; for, it may be said, that when all parts of the frame are equally weakened we feel

less disturbance,—and dissolution may, in this case, ensue with very little pain or febrile action, as we have often witnessed in the more mortal forms of Yellow-fever, or malignant Typhus.

The following, from Dr. Ure's *Chem. Dict.*, may serve to show how little is known on the subject of mephitic airs—"MIASMATA. Vapours or effluvia, which, by their application to the human system, are capable of exciting various diseases, of which the principal are intermittent, remittent, and yellow-fevers, dysentery, and typhus; the produce of moist vegetable matter in some unknown state of decomposition"; and, "that the chemical nature of all these poisons are little understood. Probably consisting of hydrogen, united with sulphur, phosphorus, carbon, and azote, in unknown proportions and unknown combination."

We might infer, from what is said in the same place, that our knowledge of the antidotes is quite as defective as of the nature of the poisons:—

"The proper neutralizers, or destroyers of these gasiform poisons, are nitric acid vapour, muriatic acid gas, and chlorine—they require to be used in situations from which the patients can be removed for their application." Even supposing that they do neutralize the deleterious vapours, still they are *no remedy for the disease*, and their effect must be very transient on the air, which will speedily return to its former offensive state. Now, were they, like the *nitrous oxide*, to act as analeptics, or as *direct antidotes to disease*, it would not be *necessary* to remove the patient, for the purpose of fumigation. It is possible that an atmosphere, kept impregnated with chlorine, *might* serve as a prophylactic, or as antipestilential—if such could be respired,—which it could not, however, except by persons accustomed to it. By another part of the article

quoted above, we may observe, that the eminent professor confounds these miasmata, under the denomination of “contagious *virus*, of the plague, small-pox, measles, typhus, &c.” p. 624.—This is not to reflect on the learned author, but merely, through him, to exhibit the prevailing opinions.

A pure air is the most essential element of life; for the blood, derived from our food, is of no avail till subjected to the action of atmospheric air in the lungs.—To give an idea how slight a contamination of this element may bring disease, it is sufficient to observe, that a small bird perishes instantly in air which contains only one part of sulphuretted hydrogen in 1500 of common air; and that a dog is destroyed by air containing 1-580th of this aerial poison.* When we reflect, too, how small a portion may suffice to induce disease or predisposition thereto, and that numerous situations exist in nature in which such deleterious agents are eliminated, it will be perceived that we have little occasion to call in the aid of *contagion* to account for the ravages of *pestilence*.

The plague, says Lord Bacon, is not often caught by physicians, nor by those who take antidotes, as mithridate, &c., nor by old people, or those of a dry and cold constitution; but it soonest seizes those who come out of the fresh air, (showing the force of habit,) those who are fasting, &c. (vol. iii, p. 166):—this, to say the least of it, furnishes no evidence of a contagious property.

Whoever duly considers the subject, judging from facts instead of idle report, will perceive that the plague is propagated sporadically, and not by contagion. It is, properly speaking, endemic in many eastern countries: in some, prevailing annually, with more or less severity, and com-

* From experiments of Thenard and Dupuytren, see *Orfila's Toxicology*, (Engl. trans.) vol. ii, p. 479.

mencing at regular periods of the year. It is agreed by all, that the disease begins and prevails chiefly in the more filthy parts of a town or harbour, which is precisely the case with other malignant epidemics.

The Franks, or strangers,—mostly European merchants and their attendants,—on the entrance of the plague, shun those spots where the fomites prevail, and seclude themselves in their houses which are situate in the more healthy spots, whilst they pay the strictest attention to *cleanliness*; passing most of their time on the turrets or flat roofs of their houses, or in apartments elevated above the mephitic air—which chiefly occupies the surface—avoiding the lower grounds and filthy spots where the mephitic fumes are engendered.—They, moreover, take care to lay in good store of the comforts and necessities of life. It is not strange, then, that these people mostly escape the infection, or *contagion* so called; whilst the disease rages amongst others, the indigent especially, immersed in, and breathing a corrupted air. Nevertheless, this greater exemption of strangers, by thus shutting themselves up, is regarded as a demonstration of the contagious nature of the plague. Besides, it not unfrequently happens, that a person coming in contact with, or close to, the diseased, is suddenly attacked,—this is regarded, most unequivocally, as human contagion or infection; whilst the consequences of breathing the *same air*, rendered still more impure by disease, together with the debilitating impression of *fear*, on a person predisposed, are all passed over quite unnoticed.

At times, however, it happens that the corrupt air will also partially invade the Franks in their *strong holds*,—when this occurs, they are never at a loss to assign a cause for it. For instance,—“some years ago, a CAT, which passed by one of the terraces into the houses of our merchants at Cairo, conveyed the plague to two of them, one

of whom died"! (Volney's *Travels in Syria*, vol. i, p. 255.) In the same manner, whenever any malignant disorder enters a seaport, ingenuity and exaggeration are never wanting, by which to trace out the cause to the arrival of *some* vessel from *some* suspected place. The same able traveller just cited, observes, that "the plague does not easily naturalize itself in Syria; and when the distemper is brought from the Archipelago, or Damietta, into the harbours of Latakia, Saide, or Acre, *it will not spread*; it rather chuses preliminary circumstances and a more complex route; but when it passes directly from Cairo to Damascus, all Syria is sure to be infected." This, it appears to me, has infinitely more the semblance of atmospheric influence than contagion: the air must be extensively depraved when it enters by way of the interior,—the sea-coast being its more common origin.

It must be granted, however, that many phenomena of plague very closely emulate contagion; and we are prone to form our conceptions from apparent causes, in preference to what is invisible. We find it also a difficult task to divest ourselves of the prejudices of education and opinions ingrafted in youth. It is not strange, therefore, that eminent physicians should be deceived, especially those who, not having seen the disease, found their opinions on vague report only:—Dr. Jackson observes, "it is unequivocally contagious in itself. It is SOMETIMES epidemic, and appears to arise when communication has not been distinctly traced; sometimes it refuses to propagate where communication is direct, the cause being unaccountably absorbed, or its operation counteracted, by an unknown condition in the habit," &c. (p. 192.) "The dangers of the disease have, for many years past, kept all the Christian powers who are connected with the shores of the Mediterranean, in a state of dread and alarm." I

should conceive, however, that the plague is ever to be considered an epidemic,—and that its “*refusing to propagate*,” and “*from unknown conditions in the habit*,” may be explained by a reference to atmospheric influence, and to the condition of individuals so exposed,—as to *predisposition*, from various debilitating causes.

The more intelligent among the Turks seem to be aware that the plague is not contagious; and, we are assured, that they do not destroy the bedding or clothes of those who die of the distemper, but, often, immediately put them on and wear them, without any ill effects, or the smallest apprehension from contagion.

Yet, in a polluted air—as that which produces the plague, no doubt the effluvia arising from the diseased and dead bodies, must tend, still more, to contaminate the air, and to hasten disease upon persons predisposed, or even suddenly to bring dissolution.

Now, such instances, which must be of frequent occurrence where the pestilence prevails, have so much the semblance of contagion, that few of the multitude are capable of perceiving the distinction.—The fact is, they consider the evil to consist in an active virus, or animal poison, called contagion or infection, when, in truth, it depends on a paralyzing, sedative agency, or a privation of the wonted stimulus of the air upon the blood and nervous system: some of the mephitic gases, however, are not merely negative, but positive poisons.

It is a curious fact, connected with pestilence, and tends to show, that what is generally termed contagion is no other than a polluted atmosphere; that, during the ravages of the yellow-fever in Spain, the sparrow, (the only bird that showed such instinctive sagacity,) quitted its dwelling to avoid the danger—the contagion so called,—whilst other small birds, by remaining, fell victims to their ignorance.

The continuance of the sparrows about a dwelling house was, therefore, considered as a proof of its non infection.*

Were it necessary, we might hence draw an additional argument against the contagion of this fever,—*for none of the diseases, undoubtedly contagious, are ever known, by their effluvia, to affect other animals beside man.*

Thus, the occasional pollutions of the air, it would seem, are abundantly sufficient to produce the various epidemical distempers,—although such conditions elude our observation, and we are unable to judge of them but from their effects,—the *eudiometer*, if intended to mean a test or measure of the purity of the air, is a misnomer.

The transit of persons, carriages, and goods, from a noxious atmosphere, may contribute to pervert that of other places,—the ingress of foul air by these means, however, will have but the most transient effect, unless other fomites pre-exist—in either partial or more general exhalations from the earth,—or from malaria brought by the winds: and such, doubtless, are the causes which spread disease at present in the north of Europe—and to the prevention of which, their *sanatory cordons* and quarantine codes will prove fruitless; or at best, nothing equivalent to the evils of the intended remedy.

Certain winds are known, at times, to bring plague and other pestilence, (as a blight is brought upon vegetables;) it has also been known to prevail even in a contrary direction, which, in such case at least, indicates its origin as a progressive emanation from the earth. We have witnessed that the shocks of an earthquake move in a given course; and there may be, for ought we know, some connexion in these phenomena. As to the question, whether the cholera will make its appearance in England,—we may say it will, and daily does occur in solitary instances; persons exposed

* See *Med. and Phys. Journal*, 1805, p. 382.

to its causes may be attacked with its most deadly forms, for in every country will partial fomes occasionally exist.

With little faith in astral plagues, or the baneful influence of the planets,—we know not what geologic changes may occur to produce a pestilential state of the atmosphere: general malaria, indeed, (such as doubtless prevailed in 1348,) might cross the Channel, but we could hardly apprehend, that the morbid agents, *operating in Russia*, will extend their sphere of action to the British shores,—and, especially, whilst so happily *guarded by all the talents*,—with the combined powers of *Quarantine and Chlorine*.*

The ancient physicians were unacquainted with the chemical composition of the atmosphere and the adventitious gases which too often defile it,—yet their practical knowledge, derived from experience and observation, was, at least, equal to ours;—of which we have sufficient proofs in the writings of Hippocrates, Galen, and others, where we may see that a vague idea has prevailed from the earliest times, that epidemics, as plague, typhus, &c., comes from a polluted atmosphere: this is shown by the Treatise of Hippocrates on Epidemics; he called it *θεῖόν τι*, something divine,—only meaning, perhaps, something beyond human comprehension. Lucretius, in his description of the plague of Athens, says, “the disease originated either in the air or the earth.”—“The pestilence walketh in darkness.” Psalms, 90.—This invisible foe, under divers names, has ever been the dreaded scourge of man.

It is surprising to observe the confusion which obscures

* Of the “contagious” nature of this malady we shall, doubtless, have abundant details from well meaning—and from interested persons: a mission, however, has been sent to Russia,—*ex parte*, perhaps, it may be said; but the deputies are gentlemen of first-rate intelligence, of one of whom, at least, I can speak—Dr. Barry—whose liberal sentiments and urbanity (whatever his opinions on the present subject) are only equalled by the talent and research displayed in his writings.

the writings of even our most experienced physicians on these subjects.—In the remarks of the venerable Dr. Jackson, on the Yellow-fever of Cadiz, (p. 193,)—which, from personal observation, he pronounced *not contagious*,—we notice the following:—“The latent quality in the atmosphere, which constitutes what is called the epidemic constitution, is absolutely unknown to physicians or naturalists. It acts on the endemic, or on the contagious fever, by secret agency.” In the same paragraph, he observes, “it produces or modifies a disease which acts like a pestilence, but does not appear to pass from person to person, and thus to multiply itself by its own act;—in fact, it is not contagious in the proper sense of the word. But though fever, modified by epidemic influence, *be not personally contagious*, it is capable of being converted into *contagious fever*, by the accumulation of its subjects in narrow and ill-ventilated apartments.”! This is truly groping in the dark;—we know that pollution of the air is increased by concentration, or by crowding many people together, and that, in such places, a greater number must be attacked,—for the two-fold reason, multiplication of chances and aggravation of the cause:—not that a new or contagious disease is generated. Such, however, are the errors which result from false associations, and the difficulty of separating ideal *contagion* from the *effects* of *foul air*. The delicate tenure by which life is sustained—depending on the purity of the air,—is not sufficiently recognised or kept in view,—or, that every orgasm and organic impulse in the system depends on a due *ventilation* of the *blood* in the lungs.

All writers concur, that there is something inexplicable in the idea of *contagion* and *pestilence*,—they are bewildered with it, and still pursue the phantom. But it is strange to observe, how men of strong reasoning powers can suffer

themselves to be misled by the most palpable fallacies:—Dr. Mead, like all others of his time, considered the plague to be highly contagious,—although, by his own showing, he ought to have been convinced of the contrary. He represents that “Grand Cairo is crowded with inhabitants who live in a very filthy manner, in narrow streets and lanes, and that through the midst of it passes a great canal, which is filled with water at the overflowing of the Nile, and after the river is decreased, it gradually dries up; into this the people throw all manner of filth, carrion, &c., so that the stench which arises from this, and the mud together, is insufferably offensive. In this posture of things the *plague, every year*, constantly preys upon the inhabitants, and *is only stopped when the Nile, by overflowing, washes away this load of filth*; the cold winds, which set in at the same time, lending their assistance by purifying the air.”—Now, I would beg leave to ask,—would any disease which is propagated by *contagion*, (as small-pox for instance), be thus arrested by the overflowing of the Nile?—Numerous facts, equally conclusive, may be gathered from travellers in the East, tending to show that the plague, like other epidemics, depends on a noxious atmosphere.

We have innumerable instances of this “most contagious” disease* (which prevails at Constantinople in *summer*—at Cairo in winter) being arrested by the overflowing of a river, by a fall of rain, or change of temperature;—yet, according to authors, its propagation depends on a specific pestilential *contagion*. But we find various kinds of plague recorded by authors under a multitude of symptoms,—as, *pestis vulgaris*, *p. remittens*, *p. interna*, &c.—and amongst other delectables, even “a *pestis benigna* :” the whole, however, when considered together, affords the

* “*Pestis*—*Typhus maxime contagiosa, cum summa debilitate*.”—Cullen.

most convincing proofs, that their *pestis* is no other than *different grades of typhoid or malignant fever*. That all these, too, are the result of divers states of atmospherical pollution, will not be denied by any one, who will, with unbiassed mind, investigate the subject.

An important distinction, besides exemption from a second attack, may be noticed between atmospheric disease and contagion,—viz. that those low malignant forms of Typhus, Cholera, Dysentery, &c., which prevail with great mortality in a pestilential or polluted state of air, (and are thence regarded as the result of contagion,) may, by prompt measures, be arrested at the onset, or quite altered in their character. It is not so with contagion, as that of small-pox, measles, yaws, &c., which have their fixed stages, and must run a certain course. This is a point deserving serious attention. The vulgar fancies regarding contagion, are to the science of medicine (if so it may be called,) what superstition is to morals and religion—an *ignis fatuus*, which beguiles the imagination and paralyzes the mind, as it were, with a dread of its own shadow.

To judge of a distempered or pestilential state of the Air.

This, unfortunately, is only learnt after many lives have been sacrificed; as the causes elude our observation. The eudiometer merely serves to indicate the relative proportion of known gases present in the air, but affords no other test of its healthy state, or of the multitude of combinations, of miasmata, &c., which may tend to render it unfit for the support of life.

Yet the physical or chemical action of the air on various animal substances, in conjunction with prevailing diseases, might enable us to form a tolerable judgment on the subject, before an epidemic could make great progress;—and, especially, were certain rules to that end experi-

mentally and carefully deduced. It has been often observed, that during the prevalence of epidemic pestilence,—and in situations abounding with palludal or marsh effluvia, that flesh *meats* soon *putrefy*, and *milk turns sour*; the same phenomena will also ensue from electrical combinations with aqueous vapour, as noticed in thunder storms.

There may be other indications suggested by a diligent inquirer,—but those at present known, were they duly considered, are capable of being matured into systematic rules, of that degree of importance, perhaps, of which, at present, we have little conception. It is much to be desired, that ingenious persons, possessing opportunities, would give attention to this subject: and especially to note most critically those changes produced on milk, animal matter, and vegetable infusions,—with the periods respectively required for such changes, under various states of temperature, humidity, and atmospheric pressure, as indicated by appropriate instruments.

When those morbid conditions are found to exist, and especially if typhoid disease, under any form, be manifested,—it is then, that the preservation of public health demands the vigilant attention of the medical faculty,—conjointly with the officers of police,—not to convert dwelling houses into prisons, to separate the sick from their friends, or to spread consternation by preaching and proclamations of *contagion*,—but promptly to remove all kinds of filth which may collect and contribute to the further pollution of the air—to see that the houses are duly cleansed and ventilated—above all, to relieve the wants of the comfortless poor, and this (in London) should be done instantly, by way of prevention, for the occasion is most urgent in every part of the metropolis—to inculcate a spirit of resignation to the dispensations of Providence—and to excite *hope* and *confidence* in all classes.

Such precautions, indeed, should ever be attended to,—in a populous community especially: for those fomites are constantly operating with more or less intensity,—inducing, or predisposing to fever, dropsy, scurvy, &c., if inadequate to the production of an epidemic malady.

RECAPITULATION AND ADDITIONAL REMARKS.

Let us no longer content ourselves supinely to witness the ravages of an invisible foe, but employ the powers which God has mercifully given us, to arrest its insidious course.

It should ever be kept in mind, that the most essential and direct principle of life is derived from the air we breathe; that a slight defect or pollution of this principle is adequate to subvert the vital powers, and bring disease and death, by depriving the blood of its wonted stimulus, thus inducing either solitary or epidemical diseases. The perversion of the air may be so excessive, as alone, speedily to destroy life, as, for example, by breathing the mephitic gases, or it may be so slight as only to induce predisposition—lowering, vitality by a slow debilitating operation; when other causes superadded, as heats, chills, moisture, fatigue, abstinence, debauches, watching, grief, fear, &c., depressing the vital powers, will lend their baneful aid, bring further debility of the frame, and collapse of the extreme vessels. Let us bear in mind, at the same time, that these causes are, plainly, of the most debilitating kind—and the indications, both for the cure and prevention, will thereby appear most evident,—viz. by *rousing the vital powers and giving tone to the solids.*

Of all poisons the septic gases, or mephitic exhalations, are the most universal,—and infinitely more destructive to animal life than all others collectively;—for these act epidemically, or on the mass of inhabitants, whilst other poisons

affect individuals only. Yet, our toxicologists attend only to the latter, and leave *epidemical* poisons, as we may term them, to triumph in their merciless and wide-spreading ravages.

It is from a consideration of the deficiency of our knowledge on this important subject, that I have been led to offer a few remarks, that may at least induce others of more ability to prosecute a subject which appears to me most imperatively to demand the attention of the medical faculty and of the real philanthropist.

Sir Gilbert Blane has observed, that diseases of debility are induced by the gradual application of debilitating causes, amongst which he considers foul air to be paramount, independent of infection or of any specific quality. This is cited from memory, and merely to show that I am not alone in these opinions: besides the venerable and learned physician just named, there are, doubtless, many others equally aware of these facts, and much better able than I am to discuss them,—yet, from inadvertence, perhaps, losing sight of their importance.

When foul miasmata prevail, we usually find various typhoid diseases obtain in the vicinity:—but, on the *same spot*, all other ailments seem to be merged in the single epidemic, especially if the air be corrupted in a high degree, or the sickness very mortal.

We may here notice, by the way, the manner in which the deleterious gases are classed by the best modern writers, in reference to their physiological properties.—ACRID POISONS:—the gas of chlorine, of muriatic acid, sulphureous, nitrous, and nitro-muriatic vapours.—NARCOTIC and STUPEFYING POISONS:—hydrogen, azote, and oxide of azote.—NARCOTIC ACRID POISONS:—carbonic.—SEPTIC or PUTRESCENT POISONS:—sulphuretted hydrogen, putrid effluvia of animal bodies, contagious effluvia, or fomites

and miasmata.* It is the latter class, the septic, which it seems are chiefly concerned in the production of epidemical pestilence,—or the malignant forms of typhus, dysentery, cholera, &c.

These poisons enter with our breath, and produce their deleterious effects by an immediate operation on the principle of life—the blood and nervous power. The mystic foe—dealing its desolating shafts silently and unseen—is known only by its effects; this alone can account for the neglect of proper means for arresting its ravages,—although there is little doubt it may, as well as other poisons, have its specific antidotes; and from my experiments on animals before cited, I feel strongly persuaded that such antidote will be found in the *gaseous oxide of nitrogen*, for it appears of all others to be the agent most expressly adapted to revive the sinking frame:—by a direct operation on the blood and vital powers—on the nervous and muscular system—to impart that peculiar stimulus which is wanting, and the absence of which constitutes the essence of Cholera, Plague, and all adynamic or pestilential disorders.

When an epidemic invades the Indians of South America, taught by experience, they remove to a distant spot to avoid the *Yawahoo* or *Kanaima* (the evil spirit, or night murderers)—equivalent, no doubt, in most cases, to the *Contagion* of Europeans. The fixed habitations of the latter, precludes this expedient in a great measure; yet I conceive they have it in their power to combat the evil on the spot—less, however, by *disinfecting* than by direct curative means—on the first warning of attack, by inhaling the *gaseous oxide of nitrogen*, and employing the remedies before advised.—(See p. 10 to 13.)†

* See Foderé, *Med. Legale*, tom. iv. And the excellent Works of Orfila, and Christison.

† The public prints are teeming with prescriptions for the Cholera, which

Nitrous oxide is a modification of *nitrogen* or *azote*, which forms a material part of all animal substances ; it is regarded as an *alkalizing* principle, and thence contrasted with *oxygen*, the principle of *acidity*.

As this gas, variously compounded, must predominate in butcheries, may it not be owing to its respiration that butchers are so remarkably exempt from certain ailments, and especially consumption? In a communication from Earl Stanhope, that very observant and learned Nobleman makes this remark—"It is said that butchers are never affected with consumption; but I know not whether such is the case, and if so, to what cause it is to be ascribed."—I have since, by inquiry of several medical men, and also of intelligent butchers, at various markets about London, ascertained the correctness of this report, and not only so, but that they seemed to be equally exempt from typhoid infection. It is said, too, that the butchers, for the most part, escaped infection at the time of the great plague in London, 1665. In general, they are remarkably robust and healthy; this I had attributed (but erroneously it

are, I presume, chiefly from persons who have witnessed only the milder forms of the disease in this country;—the following, copied into various papers, from the *Leeds Intelligencer*, may serve as an example:—"By a gentleman, who vouches for its efficacy in a great number of cases of Cholera Morbus, and affections of the bowels generally:—prepared chalk 6 drachms, white sugar 2 drachms, gum arabic do., tincture of opium 30 drops, essence of ginger 30 drops, tincture of kino half an ounce, water 7 ounces,—2 table spoonsful twice a day." Here we have tincture of opium (the more active ingredient) about 4 drops twice a day,—for a disease which may destroy life in a few hours!—the house in a blaze—a *penny squirt* is brought to extinguish it.—But independent of its obvious futility as a remedy in true Cholera, it may be regarded as most pernicious in "affections of the bowels generally"—as the mixture of chalk, opium, and kino, would tend most completely to block up the natural passages and suspend the alvine discharge;—as *bowel complaints* often depend on inflammation, the danger of such a *remedy* will be easily judged of.

appears) to their eating more meat than others—the protecting agent must exist in the air they breathe—possibly the *nitrogen* evolved by the fresh animal matter.

From later experiments, I have, moreover, learnt that the *nitrous oxide gas* is a powerful antidote to the poison of the Worary, and Prussic acid* as well as mephitic air,—all of which appear to act in a similar manner, although received through different channels—as the lungs, the stomach, and the skin,—as direct sedatives, subverting the living power, by depriving the blood of its vivifying principle. We may hence conclude, with less chance of mistake, that the same gas, *nitrous oxide*, would, if early resorted to, equally operate as an antidote to the effects of mephitic effluvia, or exhalations from the earth†—which

* This may be a point of some moment; modern chemistry having, besides its truly valuable discoveries, opened a real Pandora's box,—and added to pharmacy, *concentrated* Prussic acid,—for which no antidote is known, unless that the *ammoniacal vapors* may serve as such in slight cases.—This also is one of the supposed new discoveries, and is even noticed as such by Dr. Christison, in his Treatise, p. 571. The vapor of ammonia, however, was employed as an antidote to laurel water in the beginning of the last century.—See Mead on Poisons, p. 275.

† Since the above was written, I have consulted the works of Van Helmont, who wrote with much experience of the plague, and by which he had lost two of his own children. Although bewildered in the dark clouds of error and superstition of his time, and indulging in the most absurd reveries on the subject, he appears, nevertheless, to have entertained some very just conceptions respecting the origin of plagues; showing, too, that, in former ages, subterraneous commotions had been well recognised in their production. Speaking of the mistaken and superstitious opinions of his predecessors and contemporaries, he says,—“they, being seduced by astrologers, blamed the heaven, that by its hurtful light and motion besprinkled the air with a cruel gore, the poison whereof they have, therefore, named an epidemical or universal one. Although they saw diseases infamous in *contagion* (this he confounds with every pestilence, as done to this day,) to arise through occasion of pools, lakes, caves, poisonous soils, minerals, filths, mountains, the natural moistnesses of the earth, or a valley, or sink, or privy, from whence divers putrefactions sprang; yet they never esteemed

is the main cause—the *fons et origo*—of epidemical maladies, as malignant Typhus, the Plague, Cholera Morbus, Camp Dysentery, &c. These disorders make their advance with extreme prostration of strength and sinking of the living powers: the application should, of course, be made with the least possible delay, and followed up with other suitable remedies, as before mentioned:—the patient being immediately conveyed to the more elevated and airy apartments of the house, to be allowed the solace of his friends and a chance to recover,—instead of sending him to perish in a crowded hospital, pest-house, or other prison, polluted with accumulated filth and disease.

As prophylactics or preventives, where the morbid causes are in operation, we should resort to such means as fortify the body and the mind; bark and the preparations of iron, wholesome digestible food (duly regulating the bowels,) moderate use of wine, or other accustomed stimuli, cheerfulness, duly-proportioned exercise and rest, with proper clothing, cleanliness, and ventilation, must all be conducive to ward off the invasion of pestilential disease: common observation, indeed, has ever inculcated this maxim. Above all, it should be kept in mind, that *fear*, *grief*, and *despondency*, are amongst the most pernicious of exciting causes; and that, therefore, it becomes the duty of the medical

the disposition of these diseases, (or those hence arising) to be the pestilence, but by a separated name they called them *endemic* ones; which distinction presently laid every doubt asleep, and they have snored on in this deep sleep, glad that they had banished their own ignorance unto the heavens.”—“The Chief Physician always runs away, leaving his own sick patient in his despairing of life,” &c. “Moreover, I have shown that the earth is always the mother of putrefaction, that we may know that, popular plagues do draw their first occasional matter from an *earthquake*, and from the consequences of camps and sieges.”—V. Helmont’s *Oriatrike*, or *Physick Refined*, p. 1097 and 1125. London, 1662.

practitioner and attendants to *soothe and fortify the mind* of the patient.

Besides, I would beg leave to suggest, as one of the most important of all precautionary measures—in places where the pestilence prevails—that the house, hospital, or other building, be ventilated from above,—not by opening the doors and windows of the lower rooms, but all those of the *upper* apartments,—by which means a pure air may be obtained, even during a great pestilence.

In a matter of such vital import, a contrivance seems desirable, similar to what is used for ventilating the cabins and between decks in ships, called by mariners a wind-sail,—which is a long tube of canvas, with a broad mouth at the upper end to catch the wind. Such might be fixed at the top of the building,—passing through the sky-light—always down to the kitchen, or *lower* rooms, where a fire is kept, which, by rarefying the lower stratum, would cause it to ascend through the chimney, giving place to a constant supply of fresh and pure air,—the noxious emanations being thus diluted and borne away by the winds.*

Under such regulations and those before noticed, p. 38, an infested city might be purified; and there would be no occasion to shut up houses to prevent the intrusion of disease, or to incarcerate whole families to perish together, as was destructively practised during the prevalence of the plague in London in 1665.—For an account of the miseries inflicted on the citizens by those mischievous mea-

* In lieu of canvas, a tin tube might be substituted, branching below, if required, into different apartments: having a vane at top, to keep the mouth to the wind. Might not such mode of ventilation be also convenient (both for comfort and safety) in all crowded audiences, where numerous lamps, the breath, and perspiration, render the air very impure? as in the national assemblies, courts of justice, churches, and theatres.

sures, see *Journal of the Plague* for that year, p. 52, and sequel.

The protection afforded by ablution and exposure to air, is exemplified in the salutary effect of great *rains* and *tempests*, in arresting a pestilence, and by various facts recorded by Volney and other writers: it is observed, that the *water-carriers at Cairo do not take the plague*: their exemption is imputed to the lotion,—*washing away the contagion*. It, doubtless, acts by decomposing the mephitic air, and preventing its absorption by the pores of the skin:—these are facts, however, which demonstrate the most efficient means of purifying the air and removing the fomites of pestilential or epidemical maladies.

On the whole, then, whether chlorine or other fumigations are employed, it is certain that the most effectual mode of purifying any filthy spot, ward, prison, &c., ever employed, is by washing and *ventilation*: without the latter, the former might be worse than useless; as the noxious fumes, by combination with aqueous vapour, is rendered still more pernicious, *i. e.* when confined, or if not carried off in the wind by exhalation. It is the narrow *confined* streets and lanes—as those of Constantinople, on the sea of Marmora—abounding with *filth* and *moisture*, which prove the most fruitful sources of the plague.—At the same time, it would be absurd, and inconsistent with daily experience, to assert that noxious air is produced on land only;—it is well known that pestilential diseases, as typhus, dysentery, and cholera, often arise at sea, especially in the latter part of long voyages.—(See the writings of Sir Gilbert Blane, Dr. Trotter, and numerous authors.) Mephitic vapours may be wafted from the land; but are also evolved at sea,—less frequently, however, upon the main ocean. Diseases often originate in the corrupt air of the ship, under various collateral circumstances. From the greater cleanliness ob-

served on ship board, at the present day, such cases are of less frequent occurrence than formerly.

So long as the present confusion of terms is tolerated by medical writers, the prevailing obscurities and misconceptions must be perpetuated: we have but faint hopes, indeed, of seeing the clouds of ignorance and bigotry dispelled—whilst fostered in the schools of medicine, and obstinately maintained, through personal interests, by individuals—under the garb of authority, holding sinecures and immunities, as it were, expressly for the purpose of giving support and perpetuity to errors the most pernicious to mankind.

Were not the eyes of such persons totally closed to the lights of truth and reason, they would see (amidst other conclusive arguments) that *disorders really contagious are equally communicable in a pure or a polluted air*,—in the heat of summer and the cold of winter,—and not, like the plague, controlled by the seasons, or by the state of the atmosphere.

It is believed, that the abuses here alluded to would scarcely be tolerated at the present time in England,—such is the intelligence of the people, and especially of the general practitioners of medicine,—who would not now, perhaps, as formerly, submit to the authority of a few weak or interested professors, although, by good fortune, they may have attained to those courtly favors most revered by the vulgar.

Note 1, p. 13, line 2.—In the second stage, local congestions are developed in the viscera, which produce a consuming fever. The object or curative intention now is, to remove the internal inflammation or congestion,—to which end, (after bleeding, calomel, and opium,) external stimulant frictions, with capsicum and vinegar, contribute more than all other means commonly resorted to,—joining, at the same time, the in-

ternal use of saline laxatives,—the effervescent and sudorific juleps, with nitre, acetate of ammonia, &c.; and leeching, if necessary. The value of opium, combined with *calomel* and *cathartics*, is too little appreciated; nor is it duly considered, that, by this mode of exhibition, its peculiar effects are obtained, free from the hurtful impression, at times exerted on the *brain* and *nervous system*: thus employed, it seems to deserve the appellation of "*Manus Dei*," as given it by the ancients.

The muriated tincture of iron, in full doses, is a most useful antispasmodic remedy,—of great value both in cholera and spasmodic colic; it may be joined, occasionally, with opium, laxatives, &c. as indicated. The liquor ammonia, probably, might also prove very serviceable.

Note 2, p. 14, line 23. (Of injecting the veins.)—This fact, we may say, is the only one of any importance yet derived from the numberless wanton cruelties inflicted on dogs, during the Continental mania for injecting the veins and arteries.

Note 3, p. 32.—In answer to the observation respecting the temerity of the Turks, in wearing the apparel of those dead of the plague,—it has been objected, that "the Turks are believers in *predestination*, and are, therefore, in no apprehension of catching the disease."—This is a poor pretext indeed, in support of its contagious nature. The Turks are not fools,—and, if not aware of its real origin, they are taught by experience, that the disease is not governed by contagion,—otherwise no modes of faith would induce them to run headlong to destruction: we hear of no instances of their throwing themselves into the sea or the fire under the influence of such impression. But the same belief (in *predestination*) is also prevalent enough amongst Christians—Calvanists especially—yet we see they are in no respect the less guarded and careful of their own persons.

ABSTRACT FROM DR. URE'S CHEMICAL DICTIONARY.

Respecting the properties of the *nitrous oxide*, I annex an abstract from Dr. Ure's *Chem. Dict.* p. 635.—"The *nitrous oxide* or *prot-oxide of azote*, was discovered by Dr. Priestley, but was first accurately investigated by Sir H. Davy. The best mode of procuring it is to expose the salt called nitrate of ammonia to the flame of an argand lamp, in a glass retort. When the temperature reaches

400° F. a whitish cloud will begin to project itself into the neck of the retort, accompanied by the copious evolution of gas, which, for common experiments, may be received over water. It has all the physical properties of air. A taper plunged into this gas burns with great brilliancy; the flame being surrounded with a bluish halo. Sir H. Davy first showed, that by breathing a few quarts of it for two or three minutes, effects analogous to those occasioned by drinking fermented liquors were produced.

“ Sir H. Davy describes the effect it had upon him as follows:—Having previously closed my nostrils, and exhausted my lungs, I breathed four quarts of nitrous oxide from and into a silk bag. The first feelings were similar to those produced in the last experiment (giddiness,) but in less than half a minute, the respiration being continued, they diminished gradually, and were succeeded by a sensation analogous to gentle pressure on all the muscles, attended by an highly pleasurable thrilling, particularly in the chest and the extremities.

“ Mr. Stephen Hammick, Surgeon of the Royal Hospital, Plymouth. — In a small dose, yawning and languor. It should be observed, that the first sensation has often been disagreeable, as giddiness; and a few persons, previously apprehensive, have left off inhaling as soon as they have felt this. Two larger doses produced a glow, unrestrainable tendency to muscular action, high spirits, and more vivid ideas.

“ Mr. Robert Southey felt a sensation perfectly new and delightful. For many hours after this experiment, he imagined that his taste and smell were more acute, and is certain he felt unusually strong and cheerful. In a second experiment he felt pleasure still superior, and has since poetically remarked, that he supposes the atmosphere of the highest of all possible heavens to be composed of this gas.

“ Dr. Kinglake experienced, at first, languor, succeeded by an almost delirious, but highly pleasurable sensation in the head, which became universal, with increased tone of the muscles. At last, an intoxicating placidity absorbed all voluntary power, and left cheerfulness and alacrity for several hours. A second stronger dose produced a perfect trance for about a minute, then a glow pervaded the system. The permanent effects were an invigorated feeling of vital power and improved spirits.

“ Mr. Wedgewood breathed atmospheric air first without knowing it was so. He declared it to have no effect, which confirmed him in his disbelief of the power of the gas. After breathing the gas some time, he threw the bag from him, kept breathing on laboriously, with an open mouth, holding his nose with his left hand, without power to take it away, though aware of his ludicrous appearance; all his muscles seemed to be thrown into vibrating motions; he had a violent inclination to make antic gestures, seemed lighter than the atmosphere, and as if about to mount. Before the experiment he was fatigued by a long ride, of which he permanently lost all symptoms. In a second experiment, nearly the same effect, but with less pleasure. In a third, much greater pleasure.” — *Davy, Res. on Nit. Ox.*

Dr. Ure has repeatedly verified these results; and he observes, that a small admixture of the sulphate or muriate with the nitrate of ammonia, will destroy the intoxicating power of the gas, or render it abortive.

P. S. It has been suggested to the author, that a publication of *cases* would be desirable, in proof of his general statement. Those who require to be enticed by representations or *fabrications* of this sort by cases, got up to es-

tablish the views or opinions of a writer, may read Dr. Solomon's book, in support of the infallibility of the *balm of gilead*, and the reports of numberless others, who resort to this method to excite public attention, and to set forth extraordinary cures. Every man should be able to judge more correctly upon the sum total of his own experience, than others can do from his representations of a few particular cases.

The writer has recently met with a book which contains many valuable remarks on subjects connected with the foregoing pages;—a passage from it may be here transcribed as somewhat suitable to the present epoch—during the *hue and cry* of *cholera* and *contagion*. The entire work exhibits, in a cheering light, the *transatlantic spirit of free inquiry*; it affords the best evidence of the prevalence of reason and common sense over the remains of Gothic delusion and the blighting influence of precedents and scholastic authorities. This remark, there is reason to believe, is in perfect accordance with the sentiments entertained by many of the most enlightened men of this country.

“ The plague is also produced and propagated by a pestilential state of the atmosphere, and is liable to affect people more than once. A person in Constantinople died of the twelfth attack; and many persons in the late plague in America have been affected two or three times.

“ Dr. Mosely declares, from his personal observation, that the plague *is not contagious*.

“ In an account of the late plague in Malta, as described by Dr. Faulkland, the symptoms of the disease seem perhaps well enough described, and which bear a strong resemblance to our spotted fever. It is ludicrous to notice the serious observations that the ‘ British practitioner’ makes on the contagiousness of the disease. (See N. E.

Journal of Med. and Surg., vol. iii. p. 345.) He says, 'whilst some persons are stated to have been attacked almost immediately after the noxious contact, others were represented to have continued well an incredible length of time before any symptoms became evident.' This obsequious, but honest contagionist says, 'I have myself noted patients taken from the bosom of their families in the most distressing disease, and with perfect impunity to those with whom they had communicated;—children from their mothers, and husbands from their wives. Yet these families had used no kind of precaution whatever, not so much as an attention to common cleanliness.' Many similar instances are related, which prove the disease to be governed by the same laws as other epidemics. He seems to think the infection is only received by contact, 'directly or intermediately.' The sick he thinks must not be approached without 'an oiled silk dress.' The laws are such, that the penalty for a physician 'for feeling a pulse *even through a tobacco leaf*, with every possible precaution, was not less than fifteen or twenty days' quarantine.' What insufferable stupidity! Can it be a matter of astonishment, that no more progress has been made in the treatment of this disease, when we see physicians, magistrates, and the ignorant of all classes, combined against truth? There never has been any greater evidence given to the world of the contagiousness of the plague than that of yellow fever; nor any more of this last than that of spotted fever. Our grave author further says, he 'knew *reinfection* take place three times in one individual.' It is very likely the man had the disease three times; we are willing to credit facts, and this may be one; but it is time that the absurd and fatal theories of the old schools were called in question."—*Sketches of Epidemic Diseases in the State of Vermont*, by J. A. Gallup, M. D., p. 99.

The most conclusive arguments are derived from self

condemnation: many sophisms, we find, are so palpably absurd, as to furnish their own best refutation,—and this is exemplified in the above quotation. Law and divinity are governed by precedents and authorities: although medicine has no analogy with either of these professions, yet its votaries, affecting the same rule, have thrown the most important branch of human knowledge a century in the rear of all the physical sciences. With reason, indeed, do the friends of truth and common sense exclaim for medical reform.

By late authentic reports from the north of Europe, it is plain that the Russian Cholera and the Plague are almost identical: anthrax and bubo are not essential to the latter, and petechiæ are common to both these and other forms of pestilence; with such occasional exception, indeed, we could hardly expect the symptoms of any one disease, as recorded by different persons, more nearly to approximate.

Noxious effluvia from the earth are the main causes of extensive epidemics: the humid exhalations suspended in the air, in combination with latent heat or electric matter, tend likewise to alter the vital medium and depress the living power:—in connexion with these agents, it is not improbable that the approximation of comets, or other meteoric phenomena, may contribute to pervert the ordinary constitution of the atmosphere; and we might thus, perhaps, recognise somewhat of reality in the vague notions, which in all ages have prevailed, respecting planetary influences in the production of disease. Such, however, could only act as coinciding or auxiliary, for were such agency alone efficient, its effects would be general over the globe.

Islands, usually enjoying a better air, less frequently suffer from pestilential disorders. Malta, Sardinia, &c., must not be instanced as objections, situated as these are

in a region abounding with noxious exhalations from the earth and waters, — where cities are obliterated by volcanic lavas, and new islands are elevated by the force of ignited gas and terrestrial fires from the bottom of the sea. When a volcanic island emerged from the sea near Santerini, in 1707, M. Borguignon, being then in the Archipelago, gave an account of the scene in the *Memoirs of Arts and Sciences of Trevoux*: remarking on the emission of flame and vapours,* on the heated state of the sea, the abundance of dead fishes, &c., he says, “but above all, a stench, that infected the whole country, grew so insupportable, that persons of the strongest constitutions could scarce breathe in it; *others*, that were *weaker*, fell into frequent *faintings*; and most persons were seized with *vomitings*, &c.” — although, he says, they were infested with it only at times, as the wind happened to be, which rendered it more or less tolerable.

The effects arising from a single open volcano will be but partial and transient, but may serve to indicate the more pernicious results assignable to extensive and silent emanations; as well as to the poisonous steams and effluvia attending earthquakes. Respecting that in Sicily, for instance, (in 1662,) a particular account is given by Bonajutus, and of “the effects it had on human bodies, which were dejection, melancholy, choleric distempers, &c.—fevers, continued and tertian, *malignant*, *mortal*, and dangerous ones, in a great number, with *deliria* and

* It may be suggested, that submarine volcanos are of more frequent occurrence than is generally supposed, and at times mistaken for *water-spouts*. That described in vol. iv. No. 277 of the *Phil. Trans.* was evidently an instance of this sort — and something similar, that in which dust or sand was supposed to have been blown *six hundred miles* off the coast of Africa, as stated in the *New Monthly Magazine*: — see Brande’s *Journal of Science* for Sept. 1829, p. 33. The vast volcanic regions of the *Indian Archipelago* must, occasionally, give origin to diffusively noxious miasms.

lethargies. Where there has been any infection caused by the *natural malignity* of the air, infinite mortality has followed." — *Phil. Trans.* vol. ii. p. 409.

In those countries about the Mediterranean, plagues and pestilence are, we may say, endemial and almost annual visitants. Britain, in times past, was thought to be visited by a plague once in about forty years: Holland, and all Europe indeed, was formerly more subject to plagues: 166 years have now revolved since any very signal pestilence prevailed in this island. It is a retrospective view of past events which enables us to form a judgment respecting future probabilities. Although a corrupt air, extensively pervading the European Continent, may arrive here, (as in 1348,) and that too, without the smallest interposition of human agency, there appears little reason to apprehend such event, if other fomites are avoided.

As, in this country, the heats of the season have been unusual, we should not be surprised were such diseases as typhus and cholera to prevail more than in ordinary years;—this, however, only requires to be met by greater attention to cleanliness, ventilation, temperance, &c.—and wherever an unhealthy condition be manifested, in a dense population especially, to *disperse* the inhabitants (into healthy air), instead of keeping them *pent up* to perish under accumulated miseries.

Along with the medical admonitions, threats, and alarms of a recent manifesto of the board of health (similar to those of 1665,) the people of England will have the extreme satisfaction to learn, that the quarantine measures have hitherto been found effectual against the introduction of *Cholera Morbus!*—*ergo*, there is nothing to be feared from its importation here, — unless perchance brought, like other contraband goods, by those mischievous creatures, the *smugglers*, — over whom, most unfortunately, the mem-

bers of the *Board* and the *Quarantine Argus* have no control. If, therefore, the Cholera do *arrive* here, through “its secret and surreptitious intercourse,” the offenders may be recognised by the same negative evidence as formerly served the pious men of the *west* against *witches*,—and it would be equally just and consistent to resort to the same ordeal (the *Neptunian*) as employed, in those enlightened days, against the wicked workers in *demonology*.

The present edict enjoins, most properly, the utmost attention to cleanliness; that infected articles be purified by copious effusions (affusions?) of water,—that papers and other articles capable of holding infection, be either burnt or well boiled in strong leys; this may comprehend bank-notes, silks, satins, or what not;—such sacrifices, however, will evince the greater devotion to the *rational* doctrines of contagion, and to dogmas sanctified by time and authority, in defiance, perhaps, of common sense, reason, and experience:—so much the greater virtue of believing, for where is the difficulty or merit in giving credence to what is plain and incontrovertible? Another item in this wise decree deserves special regard,—*i. e.* that when the Cholera shall break out in any district, the inhabitants thereof shall be confined to the sickly spot, by strong bodies of soldiery or police; so that none may be allowed to escape from the noxious atmosphere. How just and reasonable the apology for this enunciation,—“We feel sure what is demanded for the common safety will be acquiesced in with *willing submission*,” &c.! Who indeed could refuse unconditional submission to those who have laboured so hard for the public weal?—Are such the fruits of reason, of the march of intellect, and English liberty? It brings to mind a certain tragedy once acted at the *Black hole* of Calcutta. Again, we are to learn from the oracles, that it has not yet been clearly ascertained how

long a period “the contagion of Cholera may lie dormant in the human frame.” We are not acquainted with any infectious disease whose virus will remain inactive in the habit for an indefinite period, excepting such as *hydrophobia*—a disease contagious in the literal sense of the term,—whose poison, like that of serpents, is communicable by *inoculation* only: such disease then, as here assumed, is a paradox, or without analogy in the whole coterie of human maladies.

The mischievous doctrines here alluded to—as false as they are destructive—and worthy of the age, not of reason, but of witchcraft,—will tend, not less than the gibberish of “unknown tongues” at Regent-square, to terrify and depress the spirits of all weakly, nervous, and timid persons: to weaken body and mind, and thus increase susceptibility to disease;—whilst the absurd belief in contagion, inculcated by authority, will be the means of depriving the sick of the assistance of their friends and the necessary aids of human society. The writer, therefore, cannot conclude without exhorting them to tranquillize their minds, and to rest assured that their fears are totally groundless, in respect to the phantom—of a *contagious* or *infectious* Cholera being *brought* to this country. It will be from their own neglect, not importation, if it do prevail here. Let temperance, industry, and cleanliness be observed,—let the masses of filth be removed from the various parts of this overgrown town, and the wants of the wretched and suffering poor be relieved, and they have nothing to fear,—not even from the power of those deluded men who would award them a prison, or shut them up to perish amidst the accumulating horrors of a pestilence.

If the reports of authors be duly scrutinized, it will appear sufficiently evident, that the plague is not *personally* communicable,—unless it be so by actual *inoculation*;—

and as to the Cholera, it has been fully proved, in the north of Europe, to be in no way contagious or infectious. All the world exclaims against the "*ambition* of the Russian Autocrat," who has, perhaps, displayed more of *human nature* than of *humanity* towards the brave people of Poland. By a recent act of the Emperor, however, in the abolition of the *incubus* of *quarantine* throughout his vast dominions, he has set an example for all Christendom, which we may predict will hereafter be recognised as an equivalent, at least, for all the alleged violations of the rights of man:—whilst the course he took was just what other sovereigns would have pursued under similar circumstances—and whilst the neighbouring and heartless potentates of the *Holy Alliance* have, with perfect indifference, given their unconditional sanction to the crusade.

J. H.

NOTICE

OF THE

Native Oil and Vapour Bath.

To the pamphlet on Cholera and Pestilence may be annexed a small tract on the Siruba, or Native Oil of Laurel, printed last year, and not hitherto published: certain advertences in which, as at pages 11, 12, 13, having lately suggested to a medical gentleman its probable utility as a remedy in such diseases: being justly considered as a powerful *antispasmodic*, *sudorific*, and *alexiterial* remedy—and possessing corresponding virtues with the Oil of *Cajeputi*—which, on good authority, we are informed, has been recently employed here with success, in several cases of Cholera. But what is more convincing—it has been stated by most respectable writers, especially in the Journal of Dr. James Johnson, to have been used, with the best effects, in the Cholera of India. Both these oils may be employed in the same doses: and it is presumed that the native product may prove, at least, equal to any remedy of this sort.

It will be said, perhaps, that this proposition results from an interested motive. Whilst, however, a total exemption from such a feeling is not professed by the writer, he is desirous that the affair may be regarded with that degree of attention only which appears reasonable, or commensurate with its real merits. His expenditures in importing the Oil into this country have been great, having in the first instance to procure it from the interior of South America,*—a notice of which may be seen in the *Lancet* of the 10th July, 1830.

In the same vol. (No. for May 29th) will be found a method, the most simple, of forming a vapour bath, suited to the capacity of every family, by which the poor as well

* The genuine article may be had at Mr. Burfield's, 180, Strand.

as the rich may resort to this important remedy, and that at the instant required: viz. by seating the patient over a common washing or bathing-tub with hot water, upon a frame, or sticks laid across, or in a chair placed in the tub, and under blankets, or other covering, to retain the steam around him. This simple means of obtaining a valuable remedy ought to be universally known, for the public in general are made to believe that a vapour bath is expensive, and beyond the reach of nine-tenths of the people;—even those professed to be the most simple are involved in tedious details about tubes, stop-cocks, recipients, &c. The vapour bath may be used as a detergent and prophylactic (preventive of disease)—from its great power, however, in exciting the extreme vessels, and opening the pores of the skin, it should not be of daily use, but chiefly resorted to as a remedy.

One of the most effectual means of fortifying the system against disease, is that of cold ablution, or rather sudden aspersion of cold water over the body, and briskly rubbing dry with coarse cloths: this, bracing the fibres, promotes the circulation, and, consecutively, all the healthy functions,—causing a grateful glow of heat throughout the body. Persons of delicate habits should commence the practice with water slightly warmed—using it gradually cooler afterwards: it affords (joined with due exercise) the best remedy for hypochondriac and nervous complaints,—for a multitude of ailments indeed,—and is more efficient, even against *indigestion*, than all the bitters, laxatives, and stomachics of the shops; at the same time, rendering these still more effectual. The practice of *sponging* the surface, is perhaps more convenient for common use, and is recommended by a justly distinguished member of the medical profession, namely, Sir Astley Cooper.

As the power of the *vapour* bath seems to be enhanced by aromatic herbs or essential oils,—any of these at hand may be thrown into the tub, and the boiling water poured

thereon, forming what is termed the aromatic vapour bath. The American natives employed, very successfully, the warm vapour, or a *turf* bath (analogous to the Roman *sudatorium*) for the cure of the most obstinate disorders:—of which some account may be seen in the *Phil. Trans.*, vol. vii. p. 669. —

The author has to regret that circumstances, which need not be stated here, have postponed, much beyond his wish, the publication of his pamphlet on Pestilential Distempers.* Since it went to press, the Cholera has appeared, in an aggravated form, in Sunderland,—brought, it is said, by some vessel from the Continent. This event is considered as a very conclusive argument for its contagiousness:—by the writer, however, it is regarded in a different light. If pestilential miasma, evolved from the earth, has travelled over land from the eastern parts of Asia, it is not difficult to suppose it might cross from the Baltic to the populous town of Sunderland,—situated, in the *line of its march* westward, on the German Ocean,—and it is said, the wind had prevailed, for some time, direct from the Baltic. Added to this—for one single cause is seldom efficient, and Newton's rule, for excluding a plurality of causes, does not apply here—it might be observed, that Sunderland has a dense population, with many of the poorest class living in wretchedness; and, possibly, the *damps* or emanations from its *mines* may, withal, contribute to deteriorate the air and engender the fomites of pestilence.

It is certain that pestilential miasma are evolved by earthquakes and volcanos—the causes of which are identified in the gaseous products of *mineral pyrites*,—and

* The author should observe, however, that a number of copies of his pamphlet on Cholera and Pestilence, and the Use of Nitrous Oxide, were distributed by the Booksellers in October and November: various hints and opinions, similar to those contained in the pamphlet, having since appeared in print, have suggested this remark.

these especially abound in the coal mines of Sunderland. "Sea coal, or that which comes from *Newcastle*," says Dr. Lister, "burns slowly; and the *Sunderland* coal so slowly, that it is said, by proverb, to make three fires; this hath much pyrites mixed with it, and burns to a heavy reddish cinder, which is iron by the magnet."—*Trans. Rl. Soc.* abridged, vol. ii. p. 423. On the whole, it appears not strange that Sunderland should be visited by a disease which is not unfrequently developed, in solitary instances, in divers parts of the kingdom: whilst the simultaneous prevalence of other analogous disorders at Sunderland, as *common cholera*, *diarrhæa*, (and as some say, typhus and dysentery,) sufficiently demonstrate a corrupted state of the atmosphere; and that the distemper is not propagated by an infection, *sui generis*, or any specific virus. Sensible persons will scarcely need be reminded of the urgent necessity of removing patients from sickly spots (low and damp situations especially,) to more lofty and airy apartments on the instant of attack. The disease will not prevail extensively, if the local causes are avoided;—and here very laudable exertions are in progress to this end, especially by the *New Board of Health* (for the City,) and by donations of benevolent persons, for relieving the wants of the poor and destitute.

Should the air, however, be extensively corrupted (which we have little reason to apprehend,) disease must prevail in various parts of the country,—and that more especially, perhaps, in the course of the ensuing year. If the *Sunderland Cholera* be contagious, *i. e.* *catching* or infectious, it will doubtless spread rapidly, since—notwithstanding the preposterous *quarantine* is allowed to paralyze commerce by *sea* and *coastwise*—a vast and unrestrained intercourse is kept up *by land*, which is infinitely more liable to propagate contagion, and would have presently brought the distemper here were it in any degree infectious, or capable of transmission.