

The third of a series of lectures delivered at the Mechanics' Institution, Southampton Buildings, Chancery Lane, Feb. 24, 1847, on the actual condition of the metropolitan grave-yards / by Geo. Alfd. Walker, Esq., surgeon.

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THE
THIRD OF A SERIES
OF
LECTURES

DELIVERED AT THE MECHANICS' INSTITUTION, SOUTHAMPTON
BUILDINGS, CHANCERY LANE, FEB. 24, 1847,

ON THE ACTUAL CONDITION OF THE

METROPOLITAN GRAVE-YARDS.

BY GEO. ALFD. WALKER, Esq., SURGEON.

"No burying-places should be tolerated within cities or towns, much less in or about CHURCHES and CHAPELS. This custom is excessively injurious to the inhabitants, and especially to those who frequent public worship in such CHAPELS and CHURCHES. God, decency, and health forbid this shocking abomination." * * * From long observation I can attest that CHURCHES and CHAPELS situated in grave-yards, and those especially within whose walls the dead are interred, are perfectly unwholesome; and many, by attending such places, are shortening their passage to the house appointed for the living. What increases the iniquity of this abominable and deadly work is, that the burying-grounds attached to many CHURCHES and CHAPELS are made a source of PRIVATE GAIN. The whole of this preposterous conduct is as indecorous and unhealthy as it is profane. Every man should know that the gas which is disengaged from putrid flesh, and particularly from a human body, is not only unfriendly to, but destructive of, animal life. Superstition first introduced a practice which self-interest and covetousness continue to maintain."—DR. ADAM CLARKE'S Commentary on Luke vii. v. 12-15.

(PRINTED BY ORDER OF THE METROPOLITAN SOCIETY FOR THE ABOLITION
OF BURIALS IN TOWNS).

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THIRD OF A SERIES

PLATES

DELIVERED AT THE METROPOLITAN INSTITUTION FOR THE IMPROVEMENT OF THE ARTS

BY THE GENERAL MANAGERS OF THE

METROPOLITAN GRAVE-YARDS

By GEO. ALD. WALKER Esq. Surgeon.

The following plates are intended to illustrate the various forms of the human skeleton, and to show the changes which take place in the bones during the progress of life. They are arranged in the order in which they are first formed, and are accompanied by a description of their structure and use. The plates are intended to be used as a guide to the student of anatomy, and to the general reader who is interested in the subject.

(Printed by order of the METROPOLITAN SOCIETY FOR THE IMPROVEMENT OF THE ARTS)

THE
THIRD OF A SERIES
OF
LECTURES
ON THE
METROPOLITAN GRAVE-YARDS.

LADIES AND GENTLEMEN,

When last I had the honour of addressing you from this place, I endeavoured to lay before you the various MORAL injuries which inevitably result from the practice of intra-mural sepulture.

In my present Lecture, I shall attempt to demonstrate some of the PHYSICAL evils inseparable from the custom of depositing the DEAD in the midst of the LIVING.

These evils, though numerous and varied, are self-inflicted, and therefore removeable. The yet lingering superstition that yearns to satisfy a non-satisfiable sentiment, that hopes to cheat corruption of his prey and the worm of his banquet,—that desires to find IN, OR NEAR, OR UNDER the CHURCH OR CHAPEL a last resting-place for its corporeal fabric, will have felt itself shocked to find from my previous statements that localities which used to be deemed sacred are subjected to periodical visitations from semi-civilized barbarians, who, while they insult our feelings, poison the source whence our very existence is derived.

I have shown you the principles and practices of grave-yard “management;” in other words, that by a process of transmutation or “clearing-out,” as it is significantly called,—leaden coffins, with their emblematical garniture, find their way into the marine-store shops, and coffin wood is employed in culinary operations,—in diffusing warmth in the abodes of the wretched and the depraved, and in corrupting the atmosphere of the localities where it is consumed.

Now, although I freely admit that we are dealing with an *inherited* evil a mischief *bequeathed* to us by our ancestors, I have yet to learn that any the least, excuse can be offered for its continuance.

Death, like life, propagates itself. He exacts from the multitudinous population of this vast city his thousand victims weekly. In his turn he knocks at every man's door,—“the bright, the brave, the beautiful,” the infant and the old man,—the young,—the full of promise,—the bouyant with expectation,—the outcast and the miserable, must one day change time for eternity.

A wise Providence has ordained that any habitual disregard of morality is soon followed by bodily suffering. Crime is invariably the parent of disease; and “such is the harmony always existing between religion and sound policy, that what is acknowledged as decorous and useful by the one, is also commanded and prescribed by the other.”

Our moral instincts, our religious sentiments, tell us that the sanctuary of the dead should remain inviolate; daily experience teaches, that the process which resolves the animal body into its elements is attended by the disengagement of matters highly injurious to the HEALTH of the LIVING.

Morality, religion, and the imperative demands of the PUBLIC HEALTH, all point out the necessity of removing the so-called resting-places of the DEAD from the habitations of MAN.

We have already seen the dreadful immorality engendered by the disregard of a duty which every Christian and civilized people, save ourselves, has accepted as a principle of conduct. Let us now proceed, without further preface, to demonstrate that the habitual disregard of this sacred duty is a paramount source of disease and death.

To those in whom the dictates of common sense have not been altogether perverted by interest or prejudice, it may seem superfluous to affirm, that the exhalations from dead bodies in a state of putrefaction are injurious to health; yet there are men of some scientific character and of high standing in society, who deny this plain, I might almost say, this self-evident proposition, in the most peremptory manner. How do these gentlemen proceed? Unable to combat the truth, they have recourse to sophistry,—to the puerile expedient of drawing positive conclusions from negative facts.

Permit me, before entering on the immediate matter of discussion, to dispose very briefly of these adversaries. In order to prove, generally, the innocuousness of decaying animal matter, they assert that professors and students of anatomy, pursuing their vocation in the midst of crowded populations, experience no injury themselves, and occasion no inconvenience to their neighbours. They quote the examples of persons who have resided near or in church-yards without suffering any evil consequences, relying especially on that of a dignitary of the church, who dwelt five years in the grave-yard of St. Botolph, yet is now the Lord Bishop of London. They cite grave-diggers, sextons, and undertakers, as examples of individuals who live long

in the enjoyment of excellent health; and, finally, they have recourse to the assertion, that "because we cannot trace the origin of any specific disease to putrid animal exhalations, they are therefore not productive of any disease at all."

You will not, I think, require from me any serious argumentation to overthrow fallacies such as those which I have just mentioned to you. A few words will suffice. Even admitting the flourishing health of medical students, sextons, and grave-diggers; granting that robust and well-fed individuals may breathe with impunity the nauseous atmosphere of a graveyard,—supposing that neither typhus nor yellow fever, the plague, or any other specific pestilence can be traced to the exhalations from the dead body, to what does such reasoning amount? It is a fact well known to all medical men, that the causes of disease do not act on all alike; that of twenty persons exposed to their influence, (no matter how energetic or powerful that influence may be), five,—ten,—fifteen will escape unhurt. The late Rev. Evan James, who gave evidence before the Parliamentary Committee, of which I have so often spoken, informed us that he buried a man in the 103rd year of his age who had been upwards of seventy years the grave-digger in Stepney.* But the reverend gentleman should have asked himself the question, how many younger grave-diggers had been cut down during the probation of the elder one? However, I may inform you, that in the year 1665, the period of the "Great Plague," in the parish of Stepney alone, 116 sextons, grave-diggers, and carters employed in removing the dead bodies, were cut off in one year!†

What would you say to the impertinent folly of the soldier who denied the danger of battle because *he* escaped from the strife unwounded? What of the mariner who ridiculed the power of the tempest because *he* never suffered shipwreck?

The fact that certain persons may be exposed to the causes of disease as well as to danger without suffering therefrom, does not prove that other individuals are equally exempt. Nothing can be more absurd than the assertion that because *some* escape, *all* must escape likewise.

We know that of a given number of individuals who are exposed to the most contagious diseases, only a certain proportion are attacked. Some will resist the inoculation of small-pox matter; many escape after being bitten by a mad dog; thousands of persons daily exposed to the morbid poisons which give rise to the plague, typhus fever, and other similar diseases, are unaffected by them. Many circumstances contribute to this immunity, which I repeat is well known to all but those who have an interest in denying its existence.

* Report on Effects of Interment of Bodies, p. 162.

† De Foe on the Plague.

The wonder is, not that some escape, but that entire populations are not exterminated.

The African flourishes in the midst of a malarious atmosphere, a single inspiration of which often engenders fatal disease in the European; certain constitutions will resist the inroad of a malady under which the less favoured perish; and medical men are fully aware that certain infections chiefly attack the poor and the inhabitants of dirty, close, and ill-ventilated localities. This has been ascertained beyond all question, for the cholera of India, the plague of Egypt, the yellow fever of America, and the scarcely less murderous and destructive typhus fever and consumption of our own country, are so many evidences, in my humble opinion, of the relationship existing between CAUSE and EFFECT. I will show you that the clearly traceable consequences, in single instances of exposure to putrid animal exhalations are so analogous in their results, that it is impossible for any sane man to deny the identity existing between the SYMPTOMS of those diseases and their PRODUCING OR EXCITING CAUSE.

The reasoning, then, of the persons to whom I have just alluded is absurd, because they attempt to draw positive conclusions from negative premises; it is still less tenable, because the negative facts on which they rely are false. Believe me, and I speak from what I have felt, and from what I have seen, the life of the medical student is not exempt from danger, nor is his condition of health so flourishing as it has been represented. Believe me, that working grave-diggers, and even non-working sextons, are not to be cited as examples of a robust and healthy-class. Believe me, if persons have inhabited the immediate neighbourhood of church-yards with apparent impunity, it is because they have been well clothed and well fed that they have been enabled to better resist the invariably depressing influence of a poison under which their poorer brethren slowly and miserably perish.

Having thus disposed of some of the principal arguments of our opponents, let us turn to the immediate subject of this Lecture. I propose to demonstrate to you by general reasoning and special facts, that during the decomposition of the human body after death, certain principles are thrown off which exercise a highly injurious influence on the HEALTH of the LIVING. The principles alluded to are denominated in medical language MORBID POISONS. It may be useful to explain to you how these poisons arise from decomposing animal matter, and how they act on the living body.

This is necessary, because some persons still exist who, either through ignorance or from a desire to hide the truth, will tell you that the malarious exhalations from vaults and church-yards may indeed offend the nostril, but cannot injure health.

During the putrefaction of animal and vegetable bodies, certain substances are generated which act as deadly poisons on the human frame, in virtue

of some peculiar but unknown condition. From their tendency to excite a certain train of symptoms, and from their power to occasion even sudden death, these substances are called **MORBID POISONS**. While going through the various processes by which the human body is gradually resolved into its elements, a number of gaseous substances, well known to chemists, and certain animal principles, are generated; but the nature of the latter has hitherto escaped discovery.

Sir Benj. Brodie,—and no one who knows his character will accuse him of a tendency to exaggerate,—informed the Parliamentary Committee that the gas evolved from putrid bodies is chiefly sulphuretted hydrogen, a gas so noxious and so deadly, that the admixture of one part of it with 500 parts of atmospheric air is almost immediately fatal.*

In addition to this deadly ingredient, other dangerous gases are liberated, and the **PECULIAR ANIMAL PRINCIPLES** already alluded to. Although we have been unable to reduce the latter to a state of palpable existence, I have not the least doubt of their presence amongst the products of putrefaction. They give rise to the nauseous deadly smell which accompanies the last metamorphosis of the human frame, and which prepares us for a separation from the bodies of the dead for ever; they render the gaseous products much heavier than they otherwise would be if composed of unmixed gas; and, finally, they give rise to most of the injuries to health inflicted by the respiration of **GRAVE-YARD atmospheres**, because the gases themselves, when breathed in a pure state, are not found to produce similar effects.

The following observations, adduced in corroboration of the evidence furnished during the Parliamentary investigation in 1842, were submitted by me to W. A. Mackinnon, Esq., the Chairman of the Committee appointed to inquire into the "**EFFECT OF INTERMENT OF BODIES IN TOWNS.**"

As they explain briefly (and I believe for the first time) the composition and the action of the compounds produced by the decomposition of the dead body, I will, with your permission, bring them under your notice:—

The gases given off during putrefaction distend the leaden coffins to such a degree that, to prevent their bursting, it is necessary frequently to bore a hole in them, to allow the gases to escape. Sometimes the gas is burnt, and the combustion continues from 15 to 20 minutes, with a faint blue flame.

That carbonic acid is generated is rendered extremely probable by the fact that it instantly extinguishes light; that it falls to the bottom of the grave when dug; and that the grave-diggers are in the habit (as stated to me by the sexton at Aldgate) of letting down empty buckets into the grave, and thus drawing up the gas, which they state they pour out like water on the surface.

All the sudden deaths which have taken place appear to have been by asphyxia (suffocation). When the gas does not immediately destroy life, it produces first

* Report on Effect of Interment of Bodies, p. 180.

an alarming sense of depression and loss of muscular power; to this succeeds a state of slight reaction; the first shock so paralyses the bodily powers, and deteriorates the circulating fluid, that neither are equal, the one to bear or the other to keep up the increased stimulation induced by the reaction of the system. The second stage corresponds to the febrile stage of typhus fever, which it closely resembles, and is attended by vomiting and purging, with sometimes flatulent eructations of a highly fetid character. Then comes the stage of exhaustion, which depends on the quantity and recency of the gas respired, and the powers of resistance of the person attacked. In a recent case the symptoms amounted merely to debility, loss of appetite, and supposed congestion, with torpid action of the liver, conjoined with sickness, oppression of breathing, and a coppery disagreeable taste in the mouth, which continued some days.

In a case which I shall subsequently bring before you, two men were instantly attacked from the effluvia of a grave, and died within a few days. The symptoms were those of plague, which Dr. Armstrong says is the typhus of this country; and indeed the analogy between the diseases of this class is so great that it is not unreasonable to suppose a similar cause for all, allowance being made for climate, habits of living, &c., which will often occasion some remarkable dissimilarity in diseases apparently the same.

Indisputable facts prove, that gaseous exhalations from dead bodies have in many instances seriously injured health, and in others immediately destroyed life. In warmer climates than our own many instances have occurred; in London within the last four years five lives have been openly sacrificed.

The more deeply a body is placed in the earth* the more slowly will putrefaction proceed; yet layers of earth of several feet in depth can no more intercept the transmission of gases into the atmosphere than they can by their density prevent the infiltration of water; the one ascends, the other descends, through a permeable medium. Gases, indeed, are evolved with such force, and in such quantity from bodies placed in leaden coffins in vaults (under a medium temperature), that the lids of such coffins, notwithstanding the atmospheric pressure, become convex, and sometimes are rent asunder, and the gases thus and otherwise evolved become diffused and mixed with the atmosphere, and enter the lungs in every inspiration.

A grave-yard presents an excellent absorbing surface, its dark colour and its loose texture affording the conditions most favourable for this process; hence during the day the superficial stratum of earth freely absorbing the heat emitted from the sun, will have its temperature thereby raised considerably above that of the superincumbent atmosphere. Now, as heat is freely communicated from one body to another in contact with it (by conduction), until an equilibrium of temperature be established, the layer or stratum of atmospheric air lying immediately

* My readers will scarcely believe, that in very many of the Metropolitan grave-yards the earth barely covers the dead interred therein. If burying-grounds capable of containing 136 bodies PER ACRE PER ANNUM are made to hold, or to give, what is falsely called burial, to ONE, TWO, and THREE THOUSAND bodies per acre per annum, the most brutal mutilations and dangerous displacements must be constant and inevitable.

The gaseous products *must pass off into the atmosphere*, even when the dead are buried at a depth of many feet from the surface. The putrefactive process, when bodies are interred at a depth of six or eight feet, is necessarily *less rapid*, and therefore less injurious to the living, than when dead bodies lie almost on the surface of the earth. Hence an imperative necessity is shown for an instant arrestation of a system of "MANAGEMENT" as scandalous as it is destructive and deadly.

upon or above the surface of the earth, receives from the latter (the earth) portions of the solar heat which it had previously absorbed, and being thus rendered specifically lighter, rises (as a balloon containing air rarefied by heat) to the higher regions of the atmosphere, its place being immediately occupied by another portion of cold air, which, in like manner, becomes heated and ascends, thus establishing a continual upward current.

The effects of such currents, most powerfully assisted by the atmospheric pressure of 2·160 lbs. upon every square foot of surface, aided by HEAT and MOISTURE, (*the absolute essentials in the putrefactive process*), in amalgamating the more solid compounds with the soil,* and dissipating the gaseous products through the atmosphere, cannot be misunderstood, and ought to be fully appreciated; for it is difficult, if not impossible, to calculate the distance to which such emanations may extend: and on the dilution, quality, quantity, and, I believe, the age of the gas, and the power of resistance of the individuals exposed to its influence, will depend the risk to the persons who inhale it.

During night the earth no longer receives heat from the sun, and since the conditions most favourable for absorption of heat are likewise those which confer the greatest radiating power, the heat previously absorbed is soon lost by radiation; the upward current ceases; gases eliminated from the grave-yards, vaults, &c. distributed in patches in the midst of human dwellings all over London, obey the impulse of gravity, that is, if lighter than the atmosphere, they ascend; if heavier, they remain diffused through its lower strata, and inflict especial injury upon the inhabitants living in the immediate neighbourhood of grave-yards, more especially where sunk areas abut upon the burial-places.

In certain states of the atmosphere, and early in the morning, the condensed gases given off from grave-yards have been seen, and the peculiar putrefactive odour of the dead was easily recognizable. I have frequently reflected with mingled feelings of disgust and pity upon the miserable, cautious, trimming policy of individuals, who, although ignorant and uninstructed in a matter of such vital import, yet refuse to be enlightened. We have a society for the prevention of cruelty to animals, societies for almost every other object than the protection of the health of the animal man. Yet it is not only cruel, but highly impolitic, to expose masses of human beings to influences that must injure their health, deteriorate their powers for industrious purposes, render them dependent upon their friends or the parish for pecuniary or other assistance, and thus, in consequence of primary neglect, the most unjustifiable experiments are made upon tissues or organs which may never recover their original tone or function.

The experience of the wisest men of all ages has gone far to prove that the mental and moral qualities of a people materially depend on their physical organization; that causes injuriously affecting the latter, must surely and inevitably blunt the susceptibility, and impair the energies of the former; and since the physical being can be modified and altered by varying the external influences acting on the population, the importance, nay, imperative necessity, of due SANATORY

* About *twelve-thirteenths* of every dead body must dissipate, and the material of which it is compounded, pass off in a gaseous form into the atmosphere, as I have above explained – or percolate through the loose sub-soil in every direction. In many grave-yards the natural cohesiveness of the soil is destroyed by the intermixture of animal matter, which finds its way into the wells in the neighbourhood, and injures the health of the persons who use the water.— See “Interment and Disinterment,” Letter VIII.

REGULATIONS for the conservation of the PUBLIC HEALTH must be a paramount and primary consideration in the projection of any scheme of social improvement.

The mode of action on the living frame of the morbid poisons thus generated has been well explained by Baron Liebig, to whom we are indebted for the satisfactory elucidation of a subject which has long occupied the attention of medical philosophers. According to the illustrious chemist just named, the effects of morbid poisons are analogous to those of fermentation. What then is fermentation, and how is this change produced?

The advance of science, Ladies and Gentlemen, consists in the simplification of knowledge; in extending the application of a simple law to phenomena which were previously supposed to be far removed from its control. Thus is the agency of electricity shown to be more universal—all-pervading; and thus (in the matter which concerns us) has a simple law been extended from common motion to chemical affinity, and from chemical affinity to human disease. The simple law to which I now allude is the following:—"A molecule (or particle of matter) set in motion is capable of imparting its own motion to another molecule with which it may come in contact."

Let us apply this law to fermentation, and reflect on the nature of ferment or yeast.

What is yeast? It is a body in a state of decomposition, the integral atoms of which are in motion. When yeast is placed in contact with a solution of sugar, it communicates to the particles of that sugar a motion similar to its own, and therefore one of decomposition. As the decomposition goes on, the yeast gradually disappears, until it is all consumed, after which decomposition ceases. But let the solution of sugar contain some gluten, what happens? Yeast, I should mention to you, is a product of the decomposition of gluten; when mixed, then, with a solution of sugar containing gluten, it first excites fermentation in the sugar, and then reproduces itself from the gluten contained in the solution. From this latter fact we derive the all-important law of the reproduction of animal poisons which we may express in the following terms:—"When a body in a state of decomposition is added to a mixed fluid in which are contained the constituent parts of that body, the latter reproduces itself by reassembling its constituent parts." We have seen how yeast will reproduce itself in a mixed fluid containing gluten, because gluten furnishes materials for fresh yeast. In the same way do the particles of small-pox, of plague, of syphilis, and other animal poisons reproduce themselves in the blood and excite disease; because in the blood they find the constituents of the substances from which they themselves were formed.

Of all parts of the living body the blood is most apt to be acted upon by substances in a state of decomposition and possessing the property just

alluded to; and this for two principal reasons.—First, because the blood is the most complex of all existing matters, and is in a state of perpetual change or transformation. Second, because the blood contains the elements of all parts of the organic body; and hence is liable to be acted on by any element which may be presented to it.

Let us now apply these general principles to facts. A piece of decayed wood placed in contact with a piece of sound wood will excite the process of decomposition in the sound wood. When muscle, cheese, portions of the brain or other animal matters, in a state of putrefaction are placed in contact with a solution of sugar, they cause its putrefaction, exactly as yeast does; in other words, they decompose it and convert it into the elements of carbonic acid and alcohol. When the same substances are placed in contact with human blood out of the body, they at once communicate to that fluid their own state of decomposition. When portions of putrid muscle, brain, or other matter are placed on a fresh wound, they excite vomiting, debility, low fever, abscesses somewhat similar to plague buboes, and, finally occasion death. Even the human stomach, which is capable of destroying the virus of small-pox, is unable to counteract some of these poisons, and hundreds of cases are on record where the elements of putrid sausages, having passed through the stomach into the blood, have excited general decomposition of the body, and thus produced lingering disease of the most remarkable and fatal nature.

It may perhaps be doubted that the injurious influence of morbid poisons depends on putrefaction, but you will, I think, be inclined to conclude with me that they do so, when I mention to you that precisely the same agents which retard fermentation or decay, render animal poisons inert. Thus, the temperature of boiling water and contact with alcohol annihilate the power of morbid poisons. The same effect is produced by acids, salts of mercury, aromatics, volatile and empyreumatic oils, and smoke. Now, all these bodies have the property of retarding or arresting putrefaction, and we have, therefore, sufficient grounds for concluding that morbid poisons act on the human body in a manner somewhat analagous to ferments, *i. e.*, by exciting a process of decomposition in the fluids and solids, each after its own kind.

Having thus explained in a general manner the mode of action of morbid poisons, I shall proceed to demonstrate to you that the emanations from dead bodies (being one species of morbid poison) are highly dangerous to life, and most injurious to health. With this object I shall now proceed to lay before you a series of proofs and illustrations of the most convincing kind.

I shall show you that putrid animal matter causes fatal disease when introduced into the human body by inoculation. I shall prove that similar effects are produced by breathing the atmosphere which surrounds bodies that have been kept too long previous to burial. I shall bring before you

examples of sudden death—of putrid fever—of lingering disease—and of various forms of deranged health arising from the effluvia given off by vaults and graves when opened. I shall show you the manifold and miserable injuries inflicted on the living by the emanations from crowded grave-yards, even when the earth covers its dead. And, finally, I shall relate to you the opinions of great and learned men, of high authorities, of the wise and good of every age and in all countries, who condemn, on the ground of injury to the public health, the disgusting practice of intra-mural sepulture.

ANIMAL POISONS may be introduced into the human body in two ways—*directly* by inoculation, and *indirectly* by the lungs and skin. You all know how the morbid poison of small-pox gets into the blood by means of the respiration or by inoculation. So it is with the morbid poison of decaying bodies.

The fatal effects of the inoculation of putrid matter during dissection have been proved by hundreds of examples. Many of the brightest ornaments of the medical profession have been cut off in this manner. The effects are sometimes almost instantaneous, and evidently arise from poisoning the blood. Thus, Sir Astley Cooper relates the case of a student who slightly pricked his finger while opening a dead body; no *local* disease could be traced, there was no appearance of the puncture, yet the unfortunate young man perished within 48 hours, under symptoms closely resembling the dreadful excitement of hydrophobia.

A grave-digger, who had wounded his finger, being engaged in digging a grave in an overcharged church-yard in London, perished in a most miserable manner from abscesses over his body in consequence of the animal compound becoming applied to his cut finger.* The poison, thus, may pass directly into the blood and excite dangerous disease, or produce death in its most dreadful aspect. This fact is incontrovertible.

Let us now proceed to show that the morbid principles may be introduced into the blood through means of the lungs, and being thus mixed with the vital fluid, give rise to a great variety of dangerous and fatal consequences. Now, as you are little likely to take up the office or fulfil the duties of the wretched class who are called grave-diggers, the question of inhalation or imbibition by the lungs is of infinitely greater importance to you than the results of inoculation from an abraded surface. As I have previously informed you, neither leaden coffins in vaults, nor burial in the earth, can prevent the exhalations from dead bodies passing into the atmosphere we inhale; it is necessary that I should insist, once and for all, that the gaseous products, once having escaped from their producing agency, become permanently mixed with the air we breathe, and enter into and corrupt the blood.

* Parliamentary Report, Effect of Interment of Bodies, p. 52.

Disease, in its many and varied forms, proceeds from causes *within* or *without* the body. A man takes air into his lungs, on the average, twenty times in a minute, or, in other words, he *inspires* the atmosphere *twenty-eight thousand eight hundred times in twenty-four hours*.

In the same period of time (twenty-four hours), the heart beating on an average seventy-five times per minute, propels into the lungs 150 ounces of blood; in the course of one hour, 562 pounds; and in twenty-four hours, 13,488 pounds.

“ It would appear that the whole surface of the ramifying air-tubes in man amounts to ONE THOUSAND FOUR HUNDRED square feet, on which extraordinary surface the blood and atmospheric air are in contact with each other, being separated merely by a moist permeable membrane. * * *

“ Although the atmospheric air and the blood are not brought into absolute contact, there is no impediment to the mutual action. The absorption of the air through the humid membrane that surrounds the sponge-like substance of the lungs is facilitated by the immense extent of surface presented, over the whole of which a thin stratum of blood is distributed, and simultaneously exposed to the atmospheric influence. The permeability of the soft tissues, especially of the membranes, by fluid and gaseous substances, is a well-known fact. It is in accordance with this law that atmospheric air finds its way into the blood. Dark red blood, inclosed in a moist bladder, soon assumes a bright red tint; a gas inclosed in a similar receptacle is found, after some time, to be partly displaced by atmospheric air.”

It is thus made evident that it is a matter of paramount importance that the atmosphere—the first and last food of man and animals—should be breathed in a pure and uncontaminated condition. It is, therefore, unwise, unjust, and impolitic to expose the majority of our population in towns to the constant influence of *gaseous compounds*, whose exact composition has as yet eluded chemical research, but of whose *immediate effects* on the human frame I have produced evidence enough to set incredulity at defiance. EMANATIONS FROM THE DEAD, escaping in a pure and concentrated form, *have caused the immediate loss of life*, and the compound that can instantly extinguish life, must, when diluted by the surrounding atmosphere, give rise to slow poisoning in a greater or less degree as circumstances more or less favourable or unfavourable are in operation.*

Before I proceed to explain to you the evil effects inevitably resulting from the practice of intra-mural burial it will be necessary to prove to you by the citation of incontrovertible facts that such dangerous and fatal consequences have been produced by, and daily result from, emanations from the bodies of the dead.

I shall show you that serious injury is inflicted on the health of survivors

* Burial-ground Incendiarism.

by the delay of interments ; that the dead body, even before it is committed to the grave, before putrefactive decomposition has made any great progress—

— “ Before decay’s effacing fingers,
Have swept the lines where beauty lingers,”

may, and often does, send forth pestilential emanations injurious to those who are compelled to breathe them. Upon this important fact I laid particular stress in my petition to the House of Commons in the month of February, 1842. I was the first, I believe, who brought the subject before the Parliament during my examination before the Committees of 1840-42. The danger, as well as the morally injurious effects of the practice, have been most fully proved by the numerous facts furnished since then to the Government Commissioner, Mr. Chadwick, by medical practitioners attached to the poor-law unions in London and the provinces.

In a great majority of cases in this huge Metropolis, and in our crowded manufacturing towns, a single room is the dwelling-place of the poor man and his family. Sometimes, indeed, there is a congregation of several families in the same apartment. In this one room are the inhabitants often generated and born. Here they eat, drink, and sleep, and here they die. In the inner ward of St. George’s, Hanover Square, in the immediate vicinity of the noble and the wealthy of that aristocratic parish, it has been ascertained that of 1,465 families of the labouring classes, no *less* than 623 possessed but a single bed for each family.* In many of the rooms from eight to twelve persons live, and when a death occurs amongst them, they are compelled to eat and sleep and perform all the necessary offices of the family in the same room with the corpse. From various circumstances which it is unnecessary for me to explain, the dead body is often kept in the dirty, crowded, and ill-ventilated apartment for many days ; sometimes I have known a dead body kept even fourteen days in warm weather before arrangements could be made for its interment. During this protracted period, the inhabitants, weakened by watching, depressed in mind, or overwhelmed by affliction, are exposed to invisible poisons passing off from the dead body, in their most concentrated and sometimes most virulent form. The body, destroyed by malignant typhus or small-pox, for example, gives off its noxious effluvia, whose component particles or atoms, disengaged in a gaseous form, again corrupt the blood, prostrate the energies, or annihilate existence in those exposed to them. Decomposition, as you may well suppose, goes on rapidly under the circumstances which I have described ; and it is, as I have proved, often necessary to tap the coffin in the room, crowded by friends and relatives of the deceased. That fatal disease must frequently result, that

* Mr. Chadwick’s Report.

lingering maladies and serious disorders must arise from the constant respiration of an undiluted poison, you can readily imagine. I will relate a case from my own experience:—A woman died of typhus fever. A lady, residing in the same house, went up stairs to read the inscription on the coffin; being short-sighted, she put her head close to the plate. Her two daughters did the same; they were all attacked by typhoid (that is, a milder form of typhus fever) soon afterwards.

Similar examples are not wanting; they occur to medical men every day, and have been fully set forth in Mr. Chadwick's supplement to the sanatory report of 1843. Allow me to quote a single case from the evidence of Mr. T. Abraham, surgeon, and one of the registrars of the City of London;* it will serve for all. Mr. Abraham was asked—

“In the course of your practice, have you had occasion to believe that evil effects are produced by the retention of the corpse in the house?—Yes; I can give an instance of a man, his wife, and six children, living in one room in Draper's Buildings. The mother and all the children successively fell ill of typhus fever: the mother died; the body remained in the room. I wished it to be removed the next day, and I also wished the children to be removed, being afraid that the fever would extend. The children were apparently well at the time of the death of the mother. The recommendation was not attended to; the body was kept five days in the only room which this family of eight had to live and sleep in. The eldest daughter was attacked about a week after the mother had been removed, and, after three days' illness, that daughter died. The corpse of this child was only kept three days, as we determined that it should positively be removed. In about nine days after the death of the girl, the youngest child was attacked, and it died in about nine days. Then the second one was taken ill; he lay twenty-three days, and died. Then another boy died. The two other children recovered.”

It is not necessary that the dead body should be in such immediate contiguity to the persons injuriously affected by it. Even the casual passenger is occasionally attacked. Here are examples which came under my own observation:—

In the month of June, 1835, a woman died of typhus fever, in the upper part of the house, No. 17, White Horse Yard, Drury Lane; the body, which *was buried on the fourth day*, was brought down a narrow staircase. Lewis Swalthey, shoemaker, then living with his family on the second floor of this house, during the time the coffin was placed for a few minutes, in a transverse position, in the door-way of his room, in order that it might pass the more easily into the street, was sensible of a most disgusting odour, which escaped from the coffin. He complained almost immediately afterwards of *a peculiar coppery taste* at the back of the throat; in a few hours afterwards he had, at irregular intervals, slight sensations of chilliness, which before the next sunset had merged into repeated shiverings of considerable intensity; that evening he was confined to his bed, and

* Mr. Chadwick's Report.

passed through a most severe form of typhus fever. He had been in excellent health up to the period of this exposure.

Mr. M——, a patient of mine, some years since was exposed to a similar influence; a stout muscular man died in his house in the month of June, after a short illness; on bringing the body down stairs, a disgustingly fetid sanies escaped from the coffin in such considerable quantity, that it flowed down the stairs; Mr. M. was instantly affected with giddiness, prostration of strength, and extreme lassitude; he had a peculiar metallic taste in the mouth, which continued some days; he believes that his health has been deranged from this cause.*

As illustrative of the effects of emanations from dead bodies *previous to interment*, I could mention many cases in which medical men and others have seriously suffered in health from post-mortem examinations. Mr. Kiernan, an eminent anatomist of this Metropolis, states that he has seen examples of severe constitutional disorder produced in persons who witnessed the post-mortem examination of individuals cut off by peritoneal inflammation, although they never touched the bodies.

Percy, the celebrated French writer gives a still stronger case.—

“ Dr. Chambon was required by the Dean of the Faculté de Medicine of Paris to demonstrate the liver and its appendages before the faculty on applying for his license. The decomposition of the subject given him for the demonstration was so far advanced, that Chambon drew the attention of the Dean to it, but he was required to go on. One of the four candidates, Corion, struck by the putrid emanations which escaped from the body as soon as it was opened, fainted, was carried home, and died in seventy hours; another, the celebrated Fourcroy, was attacked with a burning exanthematous eruption; and two others, Laguerenne and Dufresnoy, remained a long time feeble, and the latter never completely recovered. ‘As for Chambon,’ says M. Londe, ‘indignant at the obstinacy of the Dean, he remained firm in his place, finished his lecture in the midst of the Commissioners, who inundated their handkerchiefs with essences, and, doubtless, owed his safety to his cerebral excitement, which during the night, after a slight febrile attack, gave occasion to a profuse cutaneous exhalation.’ ” †

The late Dr. Armstrong gives a very striking instance of injury inflicted from a post-mortem examination:—

“ A medical man,” he says, “ made a dissection of the body of a lady who died consumptive, and, being short-sighted, he held his eyes, and, consequently, his mouth, near the lungs, during the examination. He felt a disagreeable stench, which he could not get rid of; and that very night a cough arose which never left him from that time till he came to London, and then he was certainly in a state of confirmed consumption.” The Doctor continues—“ One solitary case would

* Gatherings from Grave-yards, p. 132. † Mr. Chadwick's Report, p. 3.

not be sufficient proof, but I have seen others bearing upon the same point, which incline me to conceive, that the odour of matter in the lungs of an individual who is consumptive, operates either as a specific poison, or as a local irritant, I do not know which, and excites consumption in those who are pre-disposed to it."*

You thus perceive that the exhalations from the dead body, even before it has been committed to the earth, are capable of exciting fatal disease in persons immediately exposed to them. Having proved this fact, I shall proceed to show that the same morbid emanations give rise to similar results *after* the burial of the corpse—that no protection is afforded by the covering of earth which ought to hide for ever the bodies of the departed.

Here two series of facts present themselves:—First, the injurious consequences which result from exposure to the malaria of vaults and open graves; second, the evils inflicted by the poisonous atmosphere of crowded burial-grounds, such as they exist, inevitably exist, in the midst of this Metropolis, and of all densely populated towns.

The illustrative facts here press on me in such numbers, that my only difficulty is to select. Let us commence with sudden death, for sudden death has frequently been the consequence of compelling men to expose themselves to the fatal poison of that human charnel-house—a pauper grave. There are many such cases on record; without entering into details, I shall mention to you a few of the most remarkable examples.

On the 17th August, 1744, at 6 o'clock in the evening, a man was buried in one of the common graves of the parish church of Notre Dame, at Montpellier; the grave-digger employed became convulsed the moment he entered the pit, and fell lifeless to the bottom. A man named Robert Molinier, in attempting to rescue the grave-digger, fell a victim, and died as soon as he reached the bottom of the grave. A third individual, named Balsalgette, brother to the grave-digger, having descended in search of the body of Molinier, found that he was unable to resist the odour; he staggered to the ladder, used every effort to ascend, but at the third step fell back lifeless. Another man named Sarrau, who descended into the grave, holding by a rope, became insensible, was drawn up half dead, had vertigo and numbness, which within a quarter of an hour were succeeded by convulsions and faintings; ultimately he recovered, but was for a long time pale and emaciated, and throughout Montpellier bore the name of the "*Resuscitated*." John Molinier attempted to descend into the pit, but had scarcely entered it when, feeling himself suffocating, he gave signs to be drawn up and supported; he came up so weak and faint, that a moment's delay would have been fatal.†

These facts, published by Dr. Haguénot, of Montpellier, may be compared with similar ones which have happened in England and elsewhere. Thus the celebrated

* Gatherings from Grave-yards. † Idem, p. 92.

Italian author, Rammazzini, relates the case of a sexton, who was suffocated, and fell dead, in consequence of going down into a grave to strip a corpse which had been recently deposited there. Many of you, doubtless, remember the case, which occurred in September, 1838, in the church-yard of St. Botolph, Aldgate. Thomas Oakes, a grave-digger of six months experience only, should have rung the chimes of that church at half past ten o'clock in the morning, but, meanwhile, it was announced by the loud screams of a female that he was lying on his back, dead, at the bottom of a pauper grave 20 feet deep. Edward Luddett, a fish dealer, volunteered to descend into the grave; he reached the bottom of the ladder, attempted to raise the head of Oakes, appeared to the bystanders to be "struck, as if with a cannon ball," and instantly fell dead at the bottom of the pit in the opposite direction to the grave-digger.*

The abominable condition of this grave-yard had frequently been brought under the notice of those who were perpetuating the nuisance and extending the danger, and it is a question for our consideration how far those persons were not legally, as they were beyond doubt *morally*, responsible for a loss of life which the most common foresight would have prevented. Mr. Tyars, the deputy of Aldgate Ward, swore, at the inquest holden on these unfortunate men, that he had frequently "sent a presentment, couched in the strongest language, to the Arch-deacon of the diocese, or his surrogate, descriptive of the filthy state of the vaults and the burying-ground, but no notice had been taken of the evil." Now, I once more desire to remonstrate most strongly against the deadly and disgusting practice of this "pauper pit" system; I protest in the name of science and of our common humanity against its continuance, and that for many reasons which I have not time to enter into. It is a selfish and an unprincipled act to drive out into the atmosphere the most deadly and poisonous gases, *always* found in these pits, into the surrounding atmosphere. This is done, I assure you, all over London; lighted shavings, paper, straw, &c. are used for the purpose. The gases, charged with animal compounds, for I have obtained them (and they are much heavier than atmospheric air), are thus driven out of these deep pits and mixed with the atmosphere, which, as I have said, is the first food of the infant, the last food of the old man. If the wretched and depraved class who are the agents of those who profit by these practices, cannot, as you have seen, breathe these compounds without paying the penalty of instant death, whence do they derive their right to poison the dweller in the neighbourhood, the visitant, or the passer by? When these questions are answered, I have others to propound.

I may mention here a case of sudden death, reported in the *Annales d'Hygiène Publique* in 1840. Two men were employed in removing four dead bodies from a tomb in the Eastern Cemetery, Paris, into which a quantity of water had penetrated. On removing the third coffin their feet slipped, and the water was violently

* Gatherings from Grave-yards p. 138.

agitated; an intolerable odour issued forth. One of the men fell instantly dead, the other was seriously ill for a month.

That the poison which is thus capable, when concentrated, of instantly destroying life, may, when diluted with atmospheric air, produce either disease or disturbance of health, we can readily imagine.

Let us take, in the first instance, the evidence of injuries inflicted by VAULTS and OPEN GRAVES. To the emanations from these receptacles of the dead, sextons and grave-diggers are naturally most exposed, and it is amongst this class of persons, therefore, that we obtain the most striking examples. I shall first give you some cases which have fallen within my own experience, and then confirm the results of my personal observations by the testimony of various writers in this and other countries.

Mr. Whittaker, an undertaker, employed by me in 1839, went, in company with my pupil, Mr. Sutton, to the vaults of St. — church, for the purpose of obtaining some gas. A leaden coffin, "cruelly bloated," as one of the grave-diggers expressed it, was chosen for the purpose; the body had been placed in the vault eight years previously. The instant the coffin was tapped a most horribly offensive gas issued forth in large quantities. Mr. Whittaker was instantly affected, and was incapacitated from work for some days. His symptoms were prostration of strength, pains in the head, giddiness, and general involuntary action of the muscles, particularly of the arms, which continued for several days afterwards; these symptoms had been experienced, more or less, by Mr. W. on many previous occasions, but never to so great a degree. Mr. Sutton, less accustomed to the poisonous vapours, was confined to bed for seven days with serious illness.*

A grave-digger was employed to obtain a portion of gas from a body interred in lead, in the vaults of St. —; the man operated incautiously; he was struck to the earth, and found lying upon his back; he was recovered with considerable difficulty.†

In a burial-ground in Chelsea, a grave-digger was employed in preparing a grave close by a tier of coffins; he had dug about four feet deep, when the gas issuing from the bodies exposed affected him with asphyxia; he was found prostrate,—assistance was obtained, and with some difficulty he was recovered.‡

In the year 1835, a vault was opened in the aisle of the church of Little Birkhampstead, Herts; the body of a child had been placed in this vault about fifteen months previously; upon removing the stone, a peculiarly offensive smell was emitted,—the vault was found nearly full of water, in which the coffin was floating. My informant, the then sexton, Benjamin Smith, now living at 8, Princes Street, Drury Lane, was instantly affected with nausea, followed with diarrhœa, excessive trembling, prostration of strength, and loss of appetite; these symptoms continued some weeks. He believes that his health has seriously

* Gatherings from Grave-yards, p. 133. † Idem, p. 133. ‡ Idem, p. 134.

suffered in consequence. The bricklayer and labourer employed in opening the vault and taking out the water, were also affected, and Mrs. Smith, whilst cleaning the inside of the church, several days afterwards, was sensible of a very offensive odour, which was perceptible during divine service on the Sunday following.

Here is a still stronger case :—

William Jackson, aged 29, a strong, robust man, was employed in digging a grave in the "Savoy;" he struck his spade into a coffin, from which an extremely disgusting odour arose; he reached his home, in Clement's Lane, Strand, with difficulty; complained to his wife that he had "had a turn; the steam which issued from the coffin had made him very ill;" he had pain in the head, heaviness, extreme debility, lachrymation, violent palpitation of the heart, universal trembling, with vomiting. His wife stated that the cadaverous smell proceeding from his clothes affected her with trembling, and produced head-ache; she mentioned that she had been before affected in a similar way, although more slightly, from the same cause. Jackson recovered in a few days, although considerably debilitated. Compelled by the poverty of his circumstances, he attempted, seven days afterwards, to dig a grave in Russell Court, Drury Lane; in this ground, long saturated with dead, it was impossible, without disturbing previous occupants, to select a grave; a recently buried coffin was struck into,—the poor fellow was instantly rendered powerless, and dragged out of the grave by John Gray, to whom he was an assistant. Jackson died thirty-six hours afterwards.*

Mr. Paul Graham, residing in my immediate neighbourhood, had buried a child in Russell Court, Drury Lane; an acquaintance of his was buried in the same ground a few weeks subsequently; the survivors having a suspicion that this body had been exhumed, an undertaker was employed to ascertain the fact. Mr. G., accompanied by another person, was present during the time the lid of the coffin was partially removed; a most offensive effluvium was emitted; he was affected with instant vomiting, head-ache, confusion of intellect, prostration of strength, and trembling; the other person became unwell from the same cause; the undertaker had carefully averted his head during the partial removal of the lid of the coffin, and thus escaped its effects.†

The following important fact was communicated to me by one of the parties immediately concerned :—

Mrs. Sarah Hunt, of Jermyn Street, died September 7th, 1832, and was buried in the rector's vault, in St. James's church, Piccadily, on or about the 16th. The undertaker had occasion to go down into the vault, near the communion-table; he had done the work of the church nearly thirty years, and was well acquainted with the localities; the grave-digger had neglected to take up the slab which covered the vault. The undertaker being pressed for time, with the

* Gatherings from Grave-yards, p. 134

† Idem, p. 134.

assistance of the son of the deceased, Mr. J. Hunt, removed the stone. The two descended, taking with them a light, which was almost instantly extinguished. Upon reaching the lower step of the vault, both were simultaneously seized with sickness, giddiness, trembling, and confusion of intellect. The undertaker raised his friend, who had fallen on the floor, and with difficulty dragged him out of the vault; he himself, although a man previously in excellent health, was seized with vomiting the next day, and for twelve months rejected his food; at the end of this period, after having been under the care of many medical men, he consulted the late Dr. James Johnson from whom he derived great benefit. The patient is convinced that his health has been completely ruined from this cause; he is now obliged, after a lapse of seven years, "to live entirely by rule." The young gentleman who was with him, was subsequently under the care of many medical men upwards of two years; his principal symptoms, those of a slow poison, developed themselves gradually, but surely; he was attacked with obstinate ulceration of the throat, which were not removed until more than two years had elapsed, although he had frequent change of air, and the best medical assistance that could be obtained.

Here is another instance:—

Mr. Tombleson, a highly respectable undertaker, of No. 4, Warwick Street, Golden Square, informed me that about eleven years ago, he attended the funeral of an "Odd Fellow," on a Sunday, at Enon chapel, Clement's Lane, Strand. He smelled a disgusting stench; he was seized, within forty hours, with a violent pain in the back of the left hand, continuing about an hour; he had "cold chills" within half an hour afterwards; he took a glass of rum and water, and went to bed. He arose in the morning very ill, and consulted Dr. Burnett, of Golden Square, who ordered him home, and told him that he would "give him three weeks before he got up again." This prognostic was true to a certain extent, for the patient kept his bed nine weeks, with a malignant typhus, and all its concomitant evils.*

On the 10th of July, 1838, I was called to attend a widow, named Adams, the house-keeper to a gentleman residing in Gray's Inn Square. Some days before

* Mr. Tombleson, whom I had the pleasure of seeing and conversing with some time since, was employed as the undertaker in the case mentioned as occurring in St. James's church. He has therefore risked his life in two opposite localities, under similar circumstances. The more aristocratic church-vault and the Enon chapel receptacle were equally pestiferous. This brave man, who fought under the immortal Nelson, and was repeatedly wounded in general engagements during the late war, met with a deadlier enemy than the bullet or the boarding-pike; and he has pertinently remarked to me that he thought it hard that he, who never feared his country's foes, should have been twice prostrated by an invisible and, as he previously thought, contemptible opponent.

Mr. Tombleson informs me, as these sheets are passing through the press, that Mr. John Hunt, mentioned in the preceding case, has not recovered from the consequences of the exposure.

my arrival, she had been attacked with pain, which she referred to the region of the liver. The pulse, on my first visit, was weak and easily compressible, ranging between one hundred and twenty and one hundred and thirty. She complained of no pain, her heart beat tumultuously, the tongue was brown and dry, and protruded with difficulty; her general symptoms were those of action without power. I carefully watched the case; but, notwithstanding all my efforts, my patient sunk on the 22nd of the same month. She had been a regular attendant at Enon Chapel. She died of typhus, accompanied with symptoms of extreme putrescency. Can the cause be problematical? *

Mr. Wm. Morgan, undertaker, 30, Russell Court, Drury Lane, was employed in making room in a brick vault, in the church-yard of —, for the reception of the remains of Admiral —. He was compelled to arrange several bodies, which had been deposited in lead, in this vault. During the operation he was obliged to stand upon the top of some coffins; these gave way, and the gas produced by the decomposition of the bodies enclosed within them escaped. He was instantly sensible of a coppery taste in his mouth, with dryness and huskiness of the throat. He had confusion of intellect, extreme pain in the head, giddiness, trembling, particularly of the lower extremities, and immediate sickness upon the first inspiration of the gas. His three assistants, who were near the mouth of the tomb, were affected in a similar manner, but in a less degree. Every man within the reach of the malaria was instantly seized with vomiting. They escaped as quickly as possible from the vault into the open air, supporting each other by the arms. Mr. Morgan was conveyed home, took to his bed, had what his medical man, Dr. Davis, termed "a malignant typhus fever," and was thirteen weeks unable to follow his employment. He was previously to this exposure to the exhalations of the dead in excellent health, but his constitution was completely shattered, and he is since dead.

Mr. Jones, undertaker, of Devereux Court, Essex Street, Strand, deposited a body, contained in a leaden coffin, in the catacombs of Kensal Green Cemetery. After a lapse of about three months, he was informed by the Secretary of the Company that "the coffin leaked, and he must see to it." Mr. Jones and assistants accordingly went to the cemetery. On inspecting the leaden coffin, it was found that a small hole existed; this was enlarged with a gimlet by an assistant, Mr. T. Moxley. The gas which escaped extinguished a candle three times, and rendered him incapable of following his occupation for several weeks.

During the demolition of the old church of St. Dunstan's, the dead in the vaults were removed. The labourers employed were well supplied with brandy, and under the influence of a half-drunken excitement, completed their task. William Mutton, a labourer, a few hours after, complained of a nauseous taste in the

* Gatherings from Grave-yards, p. 136.

mouth and throat, severe pain in the chest, accompanied with cough; his skin subsequently became of a deep yellow tinge, and extremely harsh and dry. This man was at times so affected by the effluvia, that he was compelled to support himself against the wall of the vault. In removing the body of a man who had committed suicide, the gaseous exhalation was so powerful that he was rendered unconscious for a considerable period. He invariably declared that this was the cause of his death.

William Chamberlain, No. 1, Little Wild Street, Great Queen Street, was many years since employed in preparing a vault in the Green-ground, Portugal Street, Lincoln's Inn Fields, for the reception of a body. He had placed one foot on a leaden coffin in the vault and the other on the brickwork of the entrance, when he perceived a "gush, like a puff of wind, come from the coffin under his foot." He felt his power leave him, and from that time (although he never had a day's illness previously) he has never been well. His health has gradually depreciated. Since the year 1836, he has had incomplete paralysis of the upper and lower extremities, and is now perfectly incapable of following any laborious occupation.

These cases prove how multifarious are the forms of injury inflicted by decaying animal matter. I shall presently endeavour to explain this diversity of result. We do not want examples to show that the same poison will give rise to the same specific consequences, thus placing beyond doubt its pestilential agency. Here is the proof:—Thomas Beale, of No. 2, Cromwell Place, Little Shire Lane, was employed in the month of January, 1840, in assisting William West, beadle of St. Mary le Strand, to clean up the rector's vault for the reception of a body. On the evening of the same day Beale was attacked by vomiting, cough, and extreme lassitude, which continued for six days. With these general symptoms were conjoined others of a significant character, which, during my attendance on him, I did not fail to notice. He had a peculiar eruption, which first appeared over the breast, and within two days spread over the whole body. On the 14th day from the appearance of this eruption, there occurred a very painful enlargement of the glands of the left groin and armpit, these suppurated extensively during eight weeks. Four months afterwards this man still bore remains of the eruption over his arms. West, the beadle, an elderly man, was attacked by the *same* eruption, suffered for some time in a similar manner, with the exception of the glandular swelling. The much younger and stronger man, Beale, escaped ultimately, after a long struggle, while West, whom I attended, died of typhus fever.*

To my own pretty ample experience in this field I may add that of many other medical practitioners. Mr. J. C. Atkinson, surgeon, of Romney Terrace, West-

* Report on the Effect of Interment of Bodies, p. 211.

minster, to whom the public is indebted for much useful exertion in this matter, relates the following:—

“William Green, a grave-digger, while employed in his vocation in the church-yard of St. Margaret’s, Westminster, was suddenly seized with faintness, excessive chilliness, giddiness, and inability to move his limbs. He was seen to fall, was removed home, and his usual medical attendant was sent for. The poor fellow’s impression was, that ‘he should never leave his bed alive; that he was struck with death.’ He was subsequently removed to the hospital, where he died in a few days. No hope was entertained, from the first, of his recovery. Mr. B., the medical attendant, was seized with precisely the same symptoms. He was attended by me; I apprehended from the first a fatal result; he died four days after the decease of the grave-digger. The fatal effects of this miasm did not end here; the servant was seized on the day after the death of her master, and she sank in a few days. There can be no doubt of the fact, that the effluvium from the grave was the cause of the death of these three individuals. The total inefficiency, in the three cases, of all remedial means, showed the great power of the virus, or miasm, over the animal economy, from the commencement of the attack.”*

I may mention that so long back as 1814 the Commissioners for the Improvement of Westminster reported to Parliament that St. Margaret’s church-yard was no longer fit to be used as a burying-ground; yet, the “authorities” have continued to inter bodies there up to the period of this lecture.

Mr. Atkinson’s second case refers to this same grave-yard:—

“On August 23rd, 1845, he was requested to attend the funeral of his patient, Miss —, at St. Margaret’s church-yard, Westminster. During the performance of the burial-service, the situation of the parties was as follows:—The clergyman stood to the windward, or at the head of the grave; the mourners were placed laterally; whilst a mute occupied the foot, and to the leeward side of the grave. The mute, as the service advanced, staggered, was unable to keep himself erect, and became deadly pale; he was removed to the vestry-room, suffered from pain in the bowels, which ended in diarrhœa; his health was deranged during the two subsequent days; on the night of the funeral, the undertaker was seized with diarrhœa and faintness, and continued in a debilitated state for some days after; one of the mourners on his return home was affected with the same symptoms, and rendered unable to follow his employment for an entire week; and it may be as well to observe here, as a remarkable coincidence, that the wife of one of the mourners, was, late on the night of the funeral, or early next morning, attacked with apoplexy, and expired in two or three days.”

In many cases the effects of incautious exposure to putrid exhalations have been much more severe and widely extended than those just related.

* Parliamentary Report, p. 128.

Dr. Maret tells us that a mild catarrhal fever prevailed at Saulieu, in Burgundy; the body of a very fat man was buried in the parish church of St. Saturnin; twenty-three days afterwards a grave was opened by the side of the former to bury a woman, who had died of the same disease. A very fetid odour immediately filled the church, and affected all those who entered. In letting down the body a rope slipped, by which the coffin was shaken; a discharge of sanies followed, the odour of which greatly annoyed the assistants; of one hundred and seventy persons who entered the church, from the opening of the grave until the interment, one hundred and forty-nine were attacked with a malignant putrid fever, which had some resemblance to the reigning catarrhal fever, but the nature and intensity of the symptoms, and the peculiar eruption which accompanied the disease, left no doubt that the malignity was owing to the infection of the cathedral. As the persons who were affected principally dwelt near the church, and the cause was known, a stop was happily put to the contagion, but not before it had carried off thirty, among whom were the Curé and the vicar.*

In the Cyclopædia of Practical Medicine (vol. iii. p. 356), we find a well authenticated case where the effects produced were very similar to those of plague. One of the crew of an American ship near Canton died of dysentery. He was taken on shore to be buried by four comrades, two of whom began to dig his grave. While thus employed, they came on the coffin of a man who had been buried two or three months previously, and the spade went through the lid of the coffin, from which instantly arose an effluvium as intolerable as it was deadly. The two men were struck to the earth nearly lifeless, and such was the overpowering and disgusting odour, that it was with the greatest difficulty their messmates could approach near enough to drag them from the spot. On recovering from the immediate effects of the poison, they were removed on board their vessel. The succeeding morning they presented every symptom of malignant fever, so nearly resembling plague, that it was impossible to doubt its identity; they had, in fact, the "tokens" of De Foe, the "petechiæ" of Hodges, and the pestilential bubo. Both men died, one on the fourth and the other on the fifth day after the exposure. The two other men were attacked by a middle form of the same disease, and recovered.

M. Pariset has recorded an occurrence which bears some analogy to the one I have just related. In the year 1823, the Viceroy of Egypt gave orders for the construction of a large cotton manufactory in the village of Kelioub, four leagues to the north of Cairo. The foundation of the building was unfortunately laid in a burial-ground. One of the masons, while employed at work, suddenly complained of head-ache, was carried home, and died in a few hours. On the same day, eight individuals, comprising his family, were attacked by plague and cut off.

* Gatherings from Grave-yards, p. 97.

The disease rapidly spread through the village, destroying 2,000 out of its 5,000 inhabitants, and thence to Cairo, where the mortality was most appalling. The locality of the village of Kelibub had been perfectly healthy up to the time of disturbing the bodies in the burial-ground.*

The relation of cause and effect are clearly traceable in the striking examples which I have now related; if we require anything more convincing, it may be found in the fact that even animals are sometimes destroyed by the same miasm which has, as I have already proved to you, the power of producing instant death, and of slow poisoning.

In the year 1796, M. Vaidy, a surgeon in the French army, was directed to superintend the burial of about 400 soldiers and 200 horses slain in battle near the town of Nuremberg. The surgeon remained on horseback during the time of the interment, which occupied the greater part of the day. He suffered the whole time from nausea and violent colic; and the horse which he rode, a young and powerful animal, gave signs every now and then of severe distress. On returning to the camp, the horse lay down in the stable, and died almost immediately from spasm of the intestines. In the evening, the surgeon was attacked by dysentery, which continued for several days. Four orderlies who attended him were also attacked by the same disease.†

Some months since, being on a visit in the locality, I occasionally made an inspection of the grave-yards in Hull. Passing down one of its chief thoroughfares, my attention was directed to an ancient church, the chimes of which were playing facetiously enough, "Life let us cherish." Immediately opposite at a druggists, were two large notice boards, eulogising the properties of an anti-cholera mixture, which was highly recommended as "a certain cure for all complaints of the bowels." "Life let us cherish," pealed out the chimes, "cherish whilst the taper glows," whilst vaults, church, and grave-yard, were pouring out invisible but deadly miasms that were slowly poisoning the blood of the living. The cholera manufactory on a large scale (for there must be many thousands of dead bodies in that old grave-yard‡ and in those vaults) was just opposite the anti-choleric shop, which solicited the patronage of the living, whilst the grave-yard,—a place which merits the following description, noted down on the spot,—I was assured by the grave-digger, has yet plenty of room for more dead customers:—

The surface of the soil is in a most filthy, neglected, and disgusting state. Here the end of a mutilated coffin peeps out; there the foundation of a brick vault is exposed to view, and only prevented from falling by being shored up

* Annales d'Hygiene. M. Pariset on Plague, tom. vi. p. 243.

† Dict. des Sci. Med. Art. Dys., tom. x.

‡ The ground is supposed to have been first dedicated as a burial-place about the year 1801. It is described in the will of John Schayl, in 1303, as "The cemetery of Holy Trinity, of Kingston-upon-Hull."—See Cemetery Burial.

with a strong pole. Almost every bone of the human body may be seen scattered around; even while noting down the unchristian state of the burial-ground, one of the dirty urchins playing with the bones of the dead, cast at me the jaw-bone of an adult, and then turned round to its fellows to continue the shocking and revolting scene of throwing human bones at each other. Bones, ashes, and coffin-wood covered the surface where I stood. Not a single blade of grass was visible.

Within a few feet of the spot was a recently erected upright grave-stone, on which, as if in bitter irony, had been chiseled the following inscription:—

In Memory
OF
ELIZA JANE JONES,
Snowshall,
Who died October 16, 1844,
AGED 3 MONTHS.

“ Oh! snatched away in beauty's bloom,
On thee shall press no pond'rous tomb,
But on thy turf shall roses rear
Their leaves, the earliest of the year,
And the wild cypress waive in tender bloom.”

Within a few feet of this grave I noticed a large and expensive brick tomb. Between it and the church a furnace has been constructed for heating the interior. The tomb, whose foundation has been shaken, is shored up by a strong pole placed between it and the church.

In the year 1830, Mr. William Freeman was buried in this ground; in 1836, his daughter; in 1844, his wife. Yet when I visited the place on the 12th of September, 1846, I found the slab which had been erected to commemorate the deaths of these individuals mutilated, displaced, and converted into the pavement leading from the north door of the church into the vaults.

The entire aspect of this wretched locality hints most unmistakably to survivors the folly of making expensive erections to perpetuate memories in town grave-yards. Many bodies were disturbed during the making of the vaults in 1845, which are an evidence of mistaken economy and worse judgment. The steps and landings leading to these vaults are composed of whole and mutilated grave-stones.

Under the aisle, in the vaults which run from east to west, is situated a pump, from which issues a most offensive “dead man's” smell. It is employed in getting rid of the water which has percolated through the grave-yard, and which lies in puddles on the floor of the vaults. This most offensive material, containing dissolved portions of dead bodies, as I have said, is pumped up into the common sewer, and must pass off with the general contents through the gully-holes into the atmosphere.

The walls and roof of the vaults are damp and offensive. Several compartments containing bodies, or remains of bodies, are covered in, some with slight brick-work, others by old and broken grave-stones, which have evidently served as mementoes of the dead in the church-yard.

No language that I could employ would convey to your minds an impression of the effect that the circumstances I have briefly detailed to you made upon me. I conversed with the grave-digger, as he called himself. He was a youth, but had acquired more than the usual cunning of his craft. I asked him his opinion of the water in the pump, which he declared was excellent. To prove his sincerity, I invited him to give a practical test of its goodness by drinking a pint; although, had he attempted it, I should have prevented his doing so. I offered him various sums, placing, finally, some pieces of gold on the tomb-stone on which he sat, which I told him, in presence of a lady and gentleman who were with me, should be his if he would give me in his own person the proof required. This he declined.

A few days previously, I conversed with a workman who had been employed in repairing the church. He told me that he had suffered dreadfully in health whilst so engaged. I took down the following statement from a poor fellow, another victim to a system which has sacrificed too many. The narrator, whose name I suppress, because his surviving family might be exposed to official oppression, informed me that having been employed in removing bodies in the church and church-yard, he struck with a spade a coffin containing a body, from which issued a most intolerable effluvium. He was instantly affected with vomiting; had shivering, and loss of power; says, he got such a "bad smell," that he could not get rid of it for very many weeks. He used to smoke his pipe in order to get rid of the odour with which his body seemed to be charged. For months afterwards he constantly complained of chilliness and cold feet. Frequently shook violently on going to bed, and had bottles of hot water applied to restore the warmth of his body. Constantly felt weary and powerless. Was never ill before this exposure, excepting from an occasional attack of quinsey.

Such are the rough outlines of this melancholy case. A man in the very prime of life two years previously, of strong frame, in full health, was allured by the prospect of pay to his own destruction.

Although "dead men tell no tales," they furnish, to those who will read them, instructive histories; and, as I have proved, although passive in their resistance, they are fearful resenters of insults. Thus, in the present example, they dragged their victim by the "slow staggering race" of CONSUMPTION through "the valley of the shadow of death."

I should mention to you that there were other cases of various kinds resulting from the same desecration, but my informants, although able and willing to put

me on their track, dare not. They were poor men, and feared their employers and superiors.

One of them told me that the horses employed in carting away the material from this burial-place lost their appetite, and gave signs of great suffering; that a horse, valued by him at £25, had never since been well, and that he should be happy to receive £5 for him.

Another contractor lost his horse, a valuable animal, which died shortly after being employed in carting away the human "rubbish."

So much, then, for the vaults, church, and church-yard of the Holy Trinity. It is a foul profanation to mix up such abominations with such a name.

I have thus explained to you, in a manner which I trust has contributed to make a difficult subject intelligible, the various effects produced on the body by the gaseous products of human decomposition. But one part of my question has remained untouched; it is the influence exercised on health by exhalations from grave-yards. This portion, however, involves considerations of such extreme importance, that I must ask permission to make it the subject of a separate Lecture.

THE END OF LECTURE III.

APPENDIX.

THE following statements, which I have received from Mr. George Milner, of Hull, since my Lecture was delivered, fully corroborate those given in the text:—

“ HOLY TRINITY.

“So early as the year 1301, in a pastoral letter of Archbishop Corbridge, mention is made of the dedication of a cemetery to the chapel of the town of Kyngestone, within the limit of the parish of Hepell. This burying-ground is afterwards described in the will of John Schayl, in 1303, as the cemetery of Holy Trinity of Kyngston-upon-Hull; and in 1320, King Edward II. granted a vacant piece of ground, called Le Hailles, which lay at the west end of the church, for the enlargement of the church-yard. This plot of ground, which, including the site of the church, only contains about 5,040 square yards, has ever since (say for between 400 and 500 years) been used as a place of interment for the parish; it is crowded every where with bones and coffins—the latter in many instances *within a foot of the surface*. The ground, as may readily be imagined, is one mass of decomposed flesh and blood; it is raised two or three feet above the level of the streets adjoining, notwithstanding those streets have frequently been raised by repaving, &c. Holy Trinity Church is situated in the market-place, and entirely surrounded by dwellings; at the west end a row of houses is built on, and overlooks the ground, and in summer months offensive smells are frequently complained of. An Act of Parliament was obtained, and a new ground opened for this parish, containing three acres (say about 14,520 square yards). This ground has long since been filled, and no interment can now take place without disturbing human remains. The ground has also been raised, by interments, several feet above the level of the streets adjoining.

“Let us now turn to the other parish in the old town:—

“ ST. MARY’S CHURCH, LOWGATE,

Was founded about 1327 or 1333; or, at all events, it was either built or enlarged about this time, as it is described in a license, granted by Archbishop Melton to the Prior and Brethren of North Ferriby, sanctioning the performance of divine offices in the chapel, and the rites of sepulture in the ground. The present church-yard contains an area of about 750 square yards; it is frightfully crowded,

and the ground raised four or five feet above the street level, and, in some parts, is even with the bottom of the windows. The church itself is now considerably below the street level, and you descend by steps into the interior; graves cannot now be opened without mangling and displacing the remains of others. A new ground was obtained for this parish in 1774; it contains about 2,772 square yards, but is now very much crowded—so much so, that it is necessary to prick with an iron rod whenever a new grave is to be made.

“Such is the present state of things in the parishes of Holy Trinity and St. Mary’s, containing a population, according to the last census, of 41,130. Let us now look at the table of mortality of these two parishes. According to the returns published by authority of the Registrar-General from the years 1838 to 1846, inclusive, there have been no fewer than 10,601 deaths recorded in these parishes. How, then, is it possible, under existing arrangements, that the violation of the grave can be avoided? No interment can take place without desecration—the bones of the older tenant *must* be disturbed to make room for the mortal remains of another, which, in too many cases, are again dug up, long before the fulfilment of the text, ‘Dust thou art, and unto dust shalt thou return.’

“Few towns in the kingdom are in greater need of legislative interference than this; and without such interference the abuses can never be effectually remedied: besides, vested interests can only in this way be protected. In reforms of this kind the public can afford and *ought to pay* for such improvements as are for the benefit of the community at large.

“The population of the whole town, according to the last census, was 62,491; it is now upwards of 70,000, and the old church at Sculcoates, and the old ground at Drypool, with the other churches and chapels, are altogether inadequate to the wants of our growing population, setting aside the iniquity and folly of burying the dead in the midst of the living.”

METROPOLITAN SOCIETY
FOR THE
ABOLITION OF BURIALS IN TOWNS,
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