

**A treatise on removable and mitigable causes of death, their modes of origin and means of prevention ; including a sketch of vital statistics and the leading principles of public hygiene in Europe and India. v. 1.**

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### **Publication/Creation**

Calcutta : Bishop's College Press, 1852.

### **Persistent URL**

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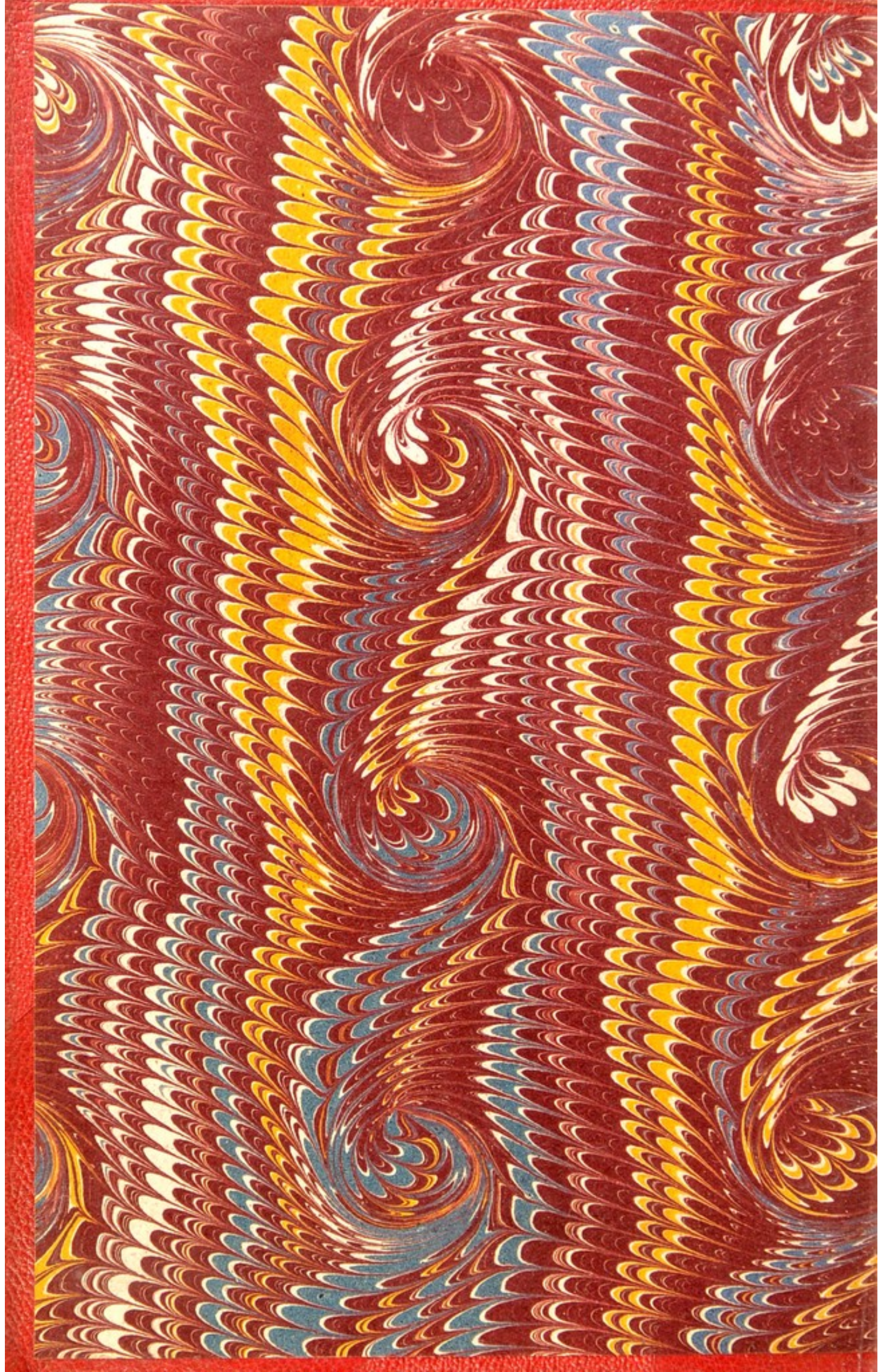


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Augustus J. Bellasis, Esq. C.S.  
with  
the Author's kindest regards.







A TREATISE  
ON  
REMOVABLE AND MITIGABLE  
CAUSES OF DEATH,  
THEIR MODES OF ORIGIN AND MEANS OF PREVENTION;  
INCLUDING A SKETCH OF  
VITAL STATISTICS  
AND THE  
LEADING PRINCIPLES OF PUBLIC HYGIENE  
IN EUROPE AND INDIA.

BY  
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VOL. I.

PRINTED FOR THE AUTHOR.

**Calcutta:**  
BISHOP'S COLLEGE PRESS.  
MDCCCLII.



Hygeia !——

—— Whatever shapes of death,  
Shook from the hideous chambers of the globe,  
Swarm through the shuddering air ; whatever plagues  
Or meagre famine breeds, or with slow wings,  
Rise from the putrid wat'ry element,  
The damp waste forest, motionless and rank,  
That smothers earth, and all the breathless winds,  
Or the vile carnage of th' inhuman field ;  
Whatever baneful breathes the rotten South ;  
Whatever ills th' extremes or sudden change,  
Of cold and hot, or moist or dry produce ;  
They fly thy pure effulgence ; they and all  
The secret poisons of avenging Heaven,  
And all the pale tribes halting in the van  
Of vice and heedless pleasure.——

—— But for thee  
Nature would sicken, Nature soon would die.

JOHN ARMSTRONG, M.D.

Can he be wise who knows not how to live ?

FRANCIS QUARLES.



TO  
SAMUEL BROWNE, Esq., R. N.,

SURGEON TO THE GENERAL HOSPITAL, AND TO THE OPHTHALMIC DISPENSARY,

BELFAST,

AS A FAITHFUL AND ABLE REPRESENTATIVE

OF THAT HONORABLE AND MUNIFICENT ORDER,

*THE UNPAID PHYSICIANS OF THE POOR,*

THESE PAGES ON THE CONSERVANCY OF THE HEALTH OF

THE INDIGENT CLASSES

ARE DEDICATED,

BY HIS AFFECTIONATE FRIEND,

THE AUTHOR.







## INTRODUCTION TO VOLUME THE FIRST.

UNDER the most favorable circumstances, the highest degree of success attainable by any writer in essaying to give form to a subject which is still in its infancy, and which is daily receiving consistency and development in all its details, must result from blending together its leading and established principles into a tolerably distinct outline which shall allow full scope for future additions and alterations.

The author does not venture to hope that this measure of success has attended the present attempt to supply a popular sketch of the most vitally interesting scientific subject of the day—PUBLIC HYGIENE. An active member of a Sanitary Commission would be the person best fitted to undertake so important a task ; and unrestrained powers of locomotion, with free access to national libraries, and to the great repositories of public documents should be his constantly-available aids in working it out. With the exception of the substance of a few articles, published some years since in a London medical review, the whole of the materials of this Treatise have been collected at Chittagong, during the unfrequent intervals of leisure allowed by extensive medical duties. This is, assuredly, no valid excuse for the enunciation of defective principles ; still, some allowance may be claimed for the scantiness of Statistics gathered at a remote Indian out-station—under the disadvantage of a slow and limited supply of books, and without the aid of a single correspondent ;—as well as for admitted narrowness in the views on Political Economy entertained by a writer who merely lays claim to a knowledge of medicine ; and who presumes to anticipate no more allowance from his



readers than a concession of the principle—"Quisquis suâ arte credendum est." Nevertheless, the following pages contain details the collection of which it is trusted will save the reader a good deal of tedious and laborious reference; while, in the aggregate, they may furnish a sufficient introduction to the subject for those who are desirous to join in the great work of spreading the benefits of Sanitary Reform at Home and in the Colonies.

Further, the author ventures to believe that, in the correlation of these facts, and in the deductions gathered from them, a first approach has been made to the desideratum of blending the principles of the English Sanitary System into the form of an Independent Science—Hence these chapters are submitted to the Public and to the Profession.

It is but rarely that a medical man can, with due regard to the etiquette of his order, address the public at large on professional subjects; but, in discussing the principles upon which sanitary laws must be established, the Divine, the Statesman, and the Physician meet on common ground—in a fair and equal consultation upon the means best calculated to promote the religious, social, and physical welfare of the human race. Formerly, the Physician merely had a voice in the management of his patients, and in the ordering of his hospital;—now, he is called upon to speak freely with regard to the best means of improving the salubrity of cities and of preserving the lives of communities; and, for the most part, his suggestions are appreciated and followed. In one department only of this great subject, the medical sanitary reformer will do well to maintain a strict reserve. It unfortunately happens that, as with all measures which involve place, patronage, and private and class interests, the beneficial operations of Sanitary Reform are materially hindered by political contests. Under these circumstances, the Physician finds his vantage-ground in a position of calm neutrality. When the Sanitary Commissioner addresses the chair-



man of the Parish Board with a—"Fair cousin you have long ruled the affairs of ——— unwisely; in future, I will assist you in ruling them better :"—and the menaced functionary, discarding the formulary of—"If it so pleaseth you, it pleaseth me"—plants himself sturdily in front of his ancestral manure-heaps, and, in effect, hurls back the anti-Atridean defiance—

Τῶν—ἃ μοι ἐστὶ—

Τῶν οὐκ ἂν τὶ φέροις ἂν ἐλὼν, ἀέκοντος ἐμεῖο.

Εἰ δ' ἄγε μὴν, πειρήσαι, ἵνα γνῶωσι καὶ οἶδε—

—with a jargon in which the expressions—"Centralization," "Vested-rights," "Monopoly," and "Local Self-Government," are abundantly misapplied;—here, the Physician may, without error, reserve his opinion, knowing that—the beneficial end having been placed clearly in view—the means of achieving it will, doubtless, be settled in due process of time; and being convinced that our Government has now entered with so much serious purpose upon the right track, that they will be equally unwilling either to interfere unfairly and unwisely in the municipal affairs of any place, or to permit local administration—so far as regards the public health—to be, in any instance, entrusted to men who are ignorantly or dishonestly hostile to the advance of real improvement.

It is trusted that this work will occasionally find its way into the hands of Magistrates, Clergymen, and Medical Men; and that it will be consulted by others engaged in the great responsibility of thinking and legislating for those large classes of the human race who have an equally scanty supply of consideration and means of action of their own;—who

—"for their humble sphere by nature fit,  
Have little understanding and no wit."—



The author, however, speaks candidly in expressing a wish that in a year or two, or perhaps even in a few months, his volumes may have to make way for a fuller and more adequate introduction to the principles of Sanitary Reform in England and India.\*

The subject of Public Health has now, deservedly and almost by necessity, become a matter of great popular interest. When it is announced to the Public as demonstrable, on statistical data, that the *inevitable* mortality of the inhabitants of the United Kingdom is probably not greater than the proportion of ten to a thousand of the population per annum ;†—but that—in one of our principal cities‡—from 29 to 35 in every thousand perish annually ;—and that there are even conditions under which the annual mortality among *adults* ranges from 22 to 69 per 1,000 :§ when it is seen that—far from our attaining the honors of grey hairs in the majority of instances—the average duration of our existence

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\* This volume was nearly ready for the press when the author first had an opportunity of perusing a little work, entitled "*Sanitary Economy—Its Principles and Practice*," which was published by the Messrs. Chambers of Edinburgh, in 1850. It is necessary to allude to this fact, as the plan adopted in the following pages bears a few accidental resemblances to that upon which the work in question is constructed. From that source, however, a few illustrative facts only have been borrowed—in addition to a large debt which the author owes to many others of the Messrs. Chambers's deservedly popular writings. The perusal of that little treatise is strongly recommended. It is especially praiseworthy for its sensible and moderate tone, and for the information which it contains regarding many of the pecuniary questions involved in the practical working of Sanitary Reform,—a very important branch of the subject which has merely received casual notice here. The author feels disappointed in not having been able to obtain a sight of several recent works on Public Health, of approved merit, especially M. Becquerel's "*Traité Élémentaire d' Hygiène Privée et Publique*—Paris, 1851 ;" and Professor Oesterlen's *Handbuch der Hygieine für den Einzelnen wie für eine Bevölkerung* : Tübingen, 1851."

† Mr. Lee.

‡ Liverpool 1842—1850-51.

§ English Hulks—1850.



does not extend to middle-age ; and that there is, even now, a part of our great Metropolis in which the duration of human life averages no more than *ten years* of suffering and decay ;\*—it is not surprising that the People at large should enter with interest into this vitally important question ; that the work of Sanitary Reform should be daily extending throughout the whole of Europe ; that it is gaining a footing in the East ; and that, in America, the subject of Public Health has become a staple item in the system of national education. In April, 1851, the State of Massachusetts passed an Act in which it is provided that—"Physiology and Hygiene shall hereafter be taught in all the public schools of the commonwealth, in all cases in which the school committee shall deem it expedient :"—and that,—“All school teachers shall hereafter be examined in their knowledge of the elementary principles of Physiology and Hygiene, and their ability to give instructions in the same.” This measure may probably be regarded as somewhat in advance of the necessities of the times :—still it is to be trusted that the example thus afforded will, at least, be so far acted upon in Europe as to lead to the establishment of a rule that a systematic acquaintance with the laws of Public Health shall constitute an essential part in the qualification of every person entering upon the duties of a Medical Practitioner.

CHITTAGONG : *October 31st, 1852.*

\* The “Potteries ;” Kensington—*Mr. Grainger’s Report.*



The first thing to be noticed is that there is a great deal of confusion in the minds of the people of this country. They are not clear as to what is the true state of affairs, and they are not clear as to what is the true nature of the government. They are not clear as to what is the true nature of the law, and they are not clear as to what is the true nature of the constitution. They are not clear as to what is the true nature of the people, and they are not clear as to what is the true nature of the nation. They are not clear as to what is the true nature of the world, and they are not clear as to what is the true nature of the universe. They are not clear as to what is the true nature of the human mind, and they are not clear as to what is the true nature of the human soul. They are not clear as to what is the true nature of the human body, and they are not clear as to what is the true nature of the human spirit. They are not clear as to what is the true nature of the human life, and they are not clear as to what is the true nature of the human death. They are not clear as to what is the true nature of the human existence, and they are not clear as to what is the true nature of the human destiny. They are not clear as to what is the true nature of the human future, and they are not clear as to what is the true nature of the human past. They are not clear as to what is the true nature of the human present, and they are not clear as to what is the true nature of the human future. They are not clear as to what is the true nature of the human life, and they are not clear as to what is the true nature of the human death. They are not clear as to what is the true nature of the human existence, and they are not clear as to what is the true nature of the human destiny. They are not clear as to what is the true nature of the human future, and they are not clear as to what is the true nature of the human past. They are not clear as to what is the true nature of the human present, and they are not clear as to what is the true nature of the human future.

THE END



## SECTION I.

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### THE CHARACTERS AND MODES OF ORIGIN OF REMOVABLE AND MITIGABLE CAUSES OF DEATH.

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“The Human Frame was not created imperfect;—we have made it so.”

HEAD.

“A wise man desires rather to avoid diseases than to take physic, and to be freed from pain rather than to find ease by remedies.”

SIR THOMAS MORE.

“If one ten-thousandth part of the money, time, and energy were employed in putting into practice the most simple and evident truths, which are now squandered in useless vagaries, the comfort, health, wealth, and happiness of all classes throughout Europe, would be more advanced in two years than in the last two hundred years. What is wanted is not a crusade to preach new opinions, but to get every body to act up to those he already has.”

CHAMBERS.



# SECTION I

THE FIRST PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1625

THE SECOND PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1626

THE THIRD PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1627

THE FOURTH PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1628

THE FIFTH PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1629

THE SIXTH PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1630

THE SEVENTH PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1631

THE EIGHTH PART OF THE HISTORY

OF THE REIGN OF CHARLES THE FIRST

IN THE YEAR 1632



## REMOVABLE AND MITIGABLE CAUSES OF DEATH.

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THEIR MODES OF ORIGIN AND THEIR MEANS OF PREVENTION,  
ETC., ETC., ETC.

DURING the past century, statistical research has developed two extremely important facts in the physical history of mankind,—namely, that the mean duration of human life is generally less than half that of the three score and ten years commonly assigned as the term of man's existence;—but that, on the other hand, communities have it, to a certain degree, in their power to diminish and restrain the causes by which the lives of their members are thus abridged: and it has become evident that, in consequence of the judicious employment of this power, the average duration of life amongst us has been, for many years, slowly, but progressively, upon the increase.

Foremost among the duties of the Physician and of the Legislator stands the obligation of investigating and remedying the causes which have led to the present deterioration of human life. While mankind in civilised countries continue to fall under the self-imposed curse of dying, in the generality of instances, before the expiration of their prime, ere the natural and irresistible advances of age have commenced their inroads; all learning, art, and science, must yield in importance to the great object of improving the PUBLIC HEALTH of communities.

There must be something morally, as well as physically, degraded in a people who have sacrificed the power of attaining old age. If it be true, as it assuredly is, that to live worthily and to live long are the two chief desiderata of Man's condition, any horde of robust savages are to be regarded as our masters in the art of obtaining the second object of human existence.

The resources of the Physician may do much in anticipating and in relieving disease in detail; but the power of the Law-Giver, if well directed, may do infinitely more in adopting salutary measures which, when properly carried into effect, must materially check the development of large classes



of the most destructive maladies. It is demonstrably a fact that, to mankind generally, has been given the power of maintaining their own existence for a given period—say seventy years; but the accumulated ills and errors of centuries have, in a great measure, prevented this power from being exercised by the individual:—thus, no care or moderation on his own part can enable the sickly and half-starved offspring of an ill-fed, vicious, and diseased race, inhabiting a dark and squalid hovel in a badly-drained and pestilential district, to avoid altogether the assaults of the sickness by which he appears to be doomed to an early death;—but the Legislature possesses, to a certain extent, the means of averting from him this evil, and of almost freeing his descendants from the injurious influences under which he suffers. He has not the power of removing from the over-populated neighbourhood in which he lives, where the excessive accumulation of human beings, and the consequent impossibility of their receiving proper support, renders a high rate of mortality among them a necessary and merciful dispensation;—but new and productive lands are open to him—the Government may enable him to emigrate. He cannot avoid the pestilential exhalations of the unhealthy quarter in which his dwelling is situated,—but the municipal authorities may correct this evil. He must either work for an undue number of hours, at an unwholesome trade, in a badly-ventilated manufactory, or resolve to meet death by starvation,—but the Law may compel his employers to place upon him no kind or amount of labour beyond that which he is able to bear, and to provide for the proper ventilation and cleansing of the work-rooms in which he toils. He cannot, it is true, throw off the faults of constitution which have descended to him from his poorly nourished and intemperate forefathers;—but the Legislature (in providing that his remuneration shall be sufficient to procure wholesome food and proper shelter for himself and his family, and in removing from him to a considerable extent the temptation to the destructive use of spirituous liquors,) may succeed in prolonging his life, and in rendering his progeny a comparatively healthy race.

In the year 1845, the mean age of death in England was calculated to be 29 years. The mean expectation of life 40 or 41 years.\*

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\* Fifth and Sixth Report of the Registrar General.



The fact that the value of human life has progressively increased amongst us during the last two hundred years, is considered to be susceptible of demonstration:\* and the

\* The calculations upon which this, as well as a large proportion of the other numerical data connected with Public Health, rests are, unfortunately, far from being absolutely conclusive. Canning's remark that "nothing is so false as figures—except facts" has long been present to every one engaged in sifting statistical evidence. There are no witnesses more pliable than figures. Many of the old Life Tables, and not a few of the new, are demonstrably wrong. Upon the whole, there appears to be reason to believe that the average duration of human life is slowly, but steadily, increasing throughout the United Kingdom; but the discrepancies in the evidence bearing upon this point are sufficiently numerous to shew that the subject requires that careful revision of which its importance renders it highly worthy.

It is principally from a comparison of the progressive rates of mortality prevailing in London that any available evidence on this point can be derived:—and, owing to the impossibility of comparing the precise ratio of population with the recorded number of deaths—(no accurate census having been taken previous to 1801)—our deductions with regard to the earlier periods, can be merely approximative to the truth.

It is stated that the annual proportion of deaths out of 1000 living among the inhabitants of London has been as follows:—

1629 to 1635 .. .. 50	1831 to 1835 { (One Cholera year) } 32
1660 „ 1679 { (Two Plague years) } 80	1840 „ 1842 .. .. 25
1728 „ 1757 .. .. 52	1849 „ 1850 { (One Cholera year) } 30
1771 „ 1780 .. .. 29	1850 „ 1851 .. .. 22.92

With regard to the mortality in England and Wales generally, the following proportion of deaths to every 1,000 births has been adduced.—(*Dr. Twiss' 'Certain Tests of a Thriving Population,'* pp. 50—51.)

1068 between 1720 and 1730	857 between 1770 and 1780
1043 .. „ .. 1730 .. „ .. 1740	787 .. „ .. 1780 .. „ .. 1790
924 .. „ .. 1740 { (Two years of great mortality) } 1750	747 .. „ .. 1790 .. „ .. 1800
858 .. „ .. 1750 .. „ .. 1760	699 .. „ .. 1800 .. „ .. 1805
840 .. „ .. 1760 .. „ .. 1770	659 .. „ .. 1805 .. „ .. 1810
	612 .. „ .. 1810 .. „ .. 1815
	623 .. „ .. 1814 .. „ .. 1820

During the whole of the present century there have been (according to the Registrar General's Report for 1844) more than three births in England to every two deaths; but it is now generally understood that a large proportion of births is not always to be taken as an evidence of improving national health;—it may be, and is, at present, in England, counterbalanced by the vast mortality among infants. Especially in the large manufacturing towns, "Population," says Mr. Porter, "does not so much increase because many are born, as because few die."

The best data on this subject that we can at present command are, of course, derivable from the tables of Life Assurance, and the general validity of those calculations, as bearing upon the progressive improvement in the value of human life, is most forcibly shewn by the commercial fact that the premia and rates of assurance upon healthy lives have been greatly reduced during the last seventy years. The discovery of defects in the earlier calculations, increased competition, and the adoption of more extended views, may



evidences that, under favourable circumstances, the mean duration of existence rises much above the general average, have been clearly adduced.\*

have tended, in some measure, to create these changes;—still, there can be little doubt that a positive increase in the value of human life—especially since the introduction of vaccination,—has been the principal cause of the improved rates.

The different tables, however, upon which these data rest, do not very satisfactorily determine the point at issue. Thus we find the Million Tontine Table of 1695 giving the expectation of life at the age of 1 year, for males, as 38·49 years; and, for females, as 43·85 years. According to Dr. Price's Northampton Table, however, the expectation of life (Cir. 1770-80) at the same age was only 33·29 years. We find, on the other hand, that at the age of five, the Tontine Table gives the expectation of males as only 39·03, and of females as 42·44, while, at the same period of life, the Northampton Table gives an expectation of 40·78 years. Still, this discrepancy is the more remarkable, seeing that we possess evidence of considerable increment in the value of infant life from the commencement of the eighteenth century. It would certainly appear that the rates of the Tontine Table were altogether too high. The Parish Registers 1813-30 give the expectation at the age of 1 year as 47·78 for males and 50·14 for females. In 1841 and 1844 the Registrar General gave the average mean age at death, in England, as 29 years. This, as including all deaths from the time of birth, will leave the comparison as follows. Million Tontine 37·61; Parish Registers 41·58 (mean of males and females); Registrar General's calculation 29;—these calculations being all founded upon the mean age at death.

The following shews the expectation of adult life, as calculated in several of the principal Life Tables:

Age.	Million Tontine. <i>Mean.</i> 1695.	Northamp- ton. 1735-80.	Government Tables. <i>Mean.</i> Cir. 1729-1829.	London Equitable. 1762-1829.	Parish Regis- ters. <i>Mean.</i> 1813-30
20	31·71	.. 33·19 ..	.. 41·19 ..	.. 41·67 ..	.. 40·16

It appears to be very certain that no substantial advance in this respect has occurred during the last thirty years. We learn from Mr. Rickman that the annual mortality in 1780, as near as could be ascertained, was 1 in 34 or 35 of the population of England. That in 1820 it was 1 in 49. On the other hand, the same authority informs us that the mortality of the inhabitants of England sunk to its minimum in the decade preceding the population abstract of 1821; and that since that time it seems to have risen as fast as it descended after the year 1800. The census of 1841 gives 1 death annually for every 44·5 persons. In 1845 the Registrar General gives the deaths as 1 in 46.

\* A multitude of details confirm this fact. It will be sufficient to select the following illustrations:

*In different Countries.*—The Registrar General's Report for 1844 gives the following as the number of living to 1 death in the principal countries of Europe, between the years 1838 and 1842. England 45; France 42; Sweden 41; Prussia 38; Austria 33; Russia 28. The average duration of life in this last country being less than 27 years.



We have abundant evidence of the fact that the infliction of *Disease* formed no portion of the Almighty's original design in the Creation of Man. Revelation declares that Physical Death was introduced as the punishment of the First Sin; and it appears that we are at liberty to believe that, in its primeval type, the now fragile and perishable body of

A contribution to the *London Medical Gazette*, in 1847, gave the following rates of mortality as prevailing in the several countries undermentioned :

Dalmatia 1 death in	46.09	one hundred years and upwards 1 in	408
England and Wales,	45.97	.. .. .	3178
Moravia, .. ..	37.89	.. .. .	1786
Lombardy, .. ..	31.03	.. .. .	3910
Gallicia, .. ..	30.64	.. .. .	1283
Bohemia, .. ..	29.81	.. .. .	1093
Venetian Territory, ..	28.45	.. .. .	19049
Upper and Lower Austria,	17.88	.. .. .	4089

The reporter of these numbers remarks that Dalmatia is a mountainous, rocky, and thinly-peopled district, its inhabitants living much in the open air. It has no large river to render it unhealthy, and the waters collected from the hills run rapidly to the sea by the Kerka and Cettina. The Venetian territory lies low—is damp and marshy,—is intersected by numerous rivers; and its vicissitudes of temperature are extremely great. The irreconcilable discrepancy between this writer's statement, with regard to the rate of mortality in Austria, and that of the Registrar General, will not pass unnoticed.

*In Town and Country.*—The following data were elicited by the Health of Towns Commission. Population to the square mile—Country 199; Town 5,100. Annual deaths in 1,000,000—Country 19,300; Town 27,073. Annual excess in Town Districts 7,773. Rate of mortality,—Country 1 in 52; Town 1 in 37.

Mr. Twiss deduces, from the Registrar General's Fifth Report, that in 1844, the probable duration of life in Surrey was 53 years; in the metropolis 40; in Liverpool 7 or 8 years. In the same Report it is stated that the mean age at death in Surrey is 34 years; in the metropolis 29 years—the same as the mean age at death in all England—whilst, from a table in the First Report of the Health of Towns Commission, it appears that 17 was, at about that period, the mean age of death in Liverpool.

In 1850, the extreme rates of mortality (within the Registrar General's survey) were 14 per 1000 (a district of Northumberland); and 33.5 per 1000 in Liverpool. This is nearly the number given, in a recent Report (1851) of the Liverpool Health Committee, for the poorer classes in that town exclusively. The Committee gives 1 death in 36 as the average for the whole of Liverpool.

*In different Towns of the same Country.*—The evidence given before the Health of Towns Commission gives the following as the then existing rates of mortality in our principal manufacturing Towns:—London 1 death in 39; Leeds and Birmingham 1 in 37; Sheffield 1 in 33; Bristol 1 in 32; Manchester (Union) 1 in 30; Liverpool (Parish) 1 in 29. Again,—Liverpool, deaths per 1000,—35; Manchester 32; Bath, Coventry, Derby, Dudley, Shrewsbury and Sunderland, 26; Carlisle and Norwich 25; Tynemouth 23; Halifax and Kildminster 21.

*In different Country Districts.*—The following facts are deduced from the same source as the above:—Anglesea 1 in 62; Isle of Wight 1 in 58; South Western District of England, including Cornwall, Devon, Somerset, Dorset and Wilts, 1 in 52; North Western, including Cheshire and Lan-



Man was endowed with all the essentials of immortality. The mighty limbs which could, for nearly ten centuries, strain under the load of sin-imposed labour; and the vigorous heart, which the penances and griefs of nine hundred years of God's displeasure failed to quell, might well have continued to endure in inexhaustible power, through countless

cashire, 1 in 37. This last high rate of mortality is evidently due to the inclusion of the extremely unhealthy towns of Lancashire and Cheshire.

*In the Towns of different Countries.*—In 1848 the annual deaths in London were in the proportion of 1 in 37; Paris, Lyons, Strasburg, 1 in 32; In Berlin 1 in 34; Leghorn 1 in 35; Nice 1 in 31; Madrid 1 in 29; Naples 1 in 28.

*In different Districts of the same Town.*—In 1844 there was one district in Leeds where the annual deaths were 1 in 28; while, in another, they were only 1 in 57. The First Report of the Registrar General shewed, for the year 1838, a variation of the annual mortality in different districts of the metropolis amounting to 100 per cent. Subsequently to this, however, the same authority has stated that the metropolis is divisible into three groups of ten districts each, under the titles of the healthiest, the medium, and the most unhealthy districts. The result was as follows:—the healthiest, with an allowance of 202 square yards to each person, have a mortality of 1 in 49; the medium, with an allowance of 102 square yards to each person, have a mortality of 1 in 41; the unhealthiest, with an allowance of 32 square yards to each person, 1 in 36.

*Among Persons of different conditions inhabiting the same Town or Nation.*—In Ashton-under-Lyne the mean average duration of human life was stated, in 1844 to be, among the operative classes, 16 years; among the upper classes, 30 years.

In 1847, Dr. Guy calculated that, in Leeds, the gentry live 44 years; the tradesmen 27; the operatives 19.

In Preston the average duration of life among these several classes was 47, 32, and 18 years.

In Bolton 34, 23, and 18 years. Manchester 38, 20, and 17 years.

Liverpool 35, 22, and 15. The average for the whole of this town was then only 17 years, which was precisely the average for the operative class alone in the most unhealthy parish in London.

Mr. Chadwick has shewn that, in St. George's, Hanover Square, the average age at which the gentry die is 45 years; labourers 27.

Dr. Guy deduced from the mortuary registers of the metropolis, for the year 1849, that, taking the average of persons dying aged 15 years and upwards, the gentry lived 59 years; the tradesmen 49; and the labouring class 48 years.

Dr. Carpenter calculates that, in France, the number of deaths per annum among the poor is more than twice as great in proportion to the whole number among those in easy circumstances. M. Villermé shews that, in the three districts of Paris in which the mortality is the least, the inhabitants are the wealthiest; and, in the three districts in which the inhabitants are the poorest, the mortality is the greatest; the difference being no less than 1 in 24 and 1 in 45, on an average of 5 years.

*Between the Sexes.*—Wherever statistical research has been carried out, it has been observed that the average amount of natural mortality is higher in the male than in the female sex.

In the three years ending 30th June 1840, Dr. G. Gregory found that the total number of deaths among males, throughout England and Wales, was 518,006; while the deaths among females were only 499,058, giving an excess of male deaths, within that period, of 18,048.



ages, had the gates of Paradise never opened upon the scene of man's retribution.

Between the 1st July 1839 and the 30th June 1840, there died in England and Wales 5247 females aged 85 and upwards; whereas there died only 3954 men of the same age—leaving an excess of 1293 in favor of the females. Among the females who died, 71 had passed the age of 100; but only 40 males. There appear to be only three diseases, common to the sexes, which carry off more females than males: they are phthisis, malignant disease, and dropsy.

According to McCulloch, the mortality of males in London is 27; of females 23 in 1,000. So that out of equal numbers living of the two sexes, 5 males die to 4 females.

The Registrar General's Report shews that, during 1843, the deaths from old age of *males* in the metropolitan districts (population 878,767) amounted to 1368, of whom 64 were 90 years old and upwards; whereas the *females* (population 996,726) enumerated in the same category were 2173; 123 individuals being 90 and upwards. The same peculiarity occurred in the Kent district, where the total males, out of a male population of 232,228, amounted to 476, of whom 31 had passed their 90th year; but the deaths of females, similarly classified, (population 236,885) were 552; 58 of these being 90 years old and upwards.—(*London Medical Gazette.*)

*Between Persons of various Professions.*—The calculations of different Statisticians, with regard to the influence of profession on mortality, are still so greatly at variance that it is difficult to arrive at any decided conclusion upon the subject. This will be shewn by comparing the following Tables:—

*Casper.**Bellefroid.*

Of 100 Theologians there have attained the age of 70 and upwards, .. .. .	42	Average age at death of individuals reaching their 28th year.	
Agriculturists and Foresters, ..	40	Clergymen, .. .. .	65
Superintendents, .. .. .	35	Farmers, Physicians, Merchants, ..	64
Commercial and Industrious Men, .. .. .	35	Military Officers, .. .. .	64½
Military Men, .. .. .	32	Barristers and Artists, .. .. .	62
Subalterns, .. .. .	32	Professors in Universities, ..	63½
Advocates, .. .. .	29	Poets, .. .. .	61
Artists, .. .. .	28	Monarchs, .. .. .	56½
Teachers, Professors, .. .. .	27		
Physicians, .. .. .	24		

Dr. Guy finds that, among the professions in England, the Clergy rank first, as being the most healthy; next Physicians and Surgeons; and, lastly, Lawyers—but the last two are nearly on a par. These deductions nearly agree with those of the Bellefroid.

An interesting paper, in *Chambers's Edinburgh Journal* for 1846, shews that, taking the ages of 196 Sovereigns who, from the 9th to the 19th century, ruled in Europe and China, it will be found that their average age at death was 50 years; and that, of this number, only 18 reached the age of three score and ten years. Dr. Guy gives the following numbers as the ages at death of all the several classes dying at the age of 31 years and upwards:

Kings of England, .. .. .	59 years.
Members of Royal Houses, not being crowned heads, ..	64 "
Members of the Families of the Peerage and Baronetage, ..	67 "
English Gentry, .. .. .	70 "



We have no evidence that any of those who inhabited the earth previous to the Flood died, from *natural* causes, before the expiration of their six hundredth year. Subsequently to the Deluge, we find the term of natural life declining from about 450 to 110 years.\* Henceforward, the present term of man's existence—(as declared by the Psalmist and as exemplified in his own person)—the three score years and ten has become the boundary across which few of our degenerate race have stepped with a vigorous tread. Still we have sufficient evidence of the fact that, under favorable circumstances, the body of man is, even now, capable of enduring for upwards of a century and a half. Revelation and science alike demonstrate that,—the Divine Judge having placed the penalty of death on man,—man himself has provided that the execution of his sentence shall be early.

The history of the Jewish nation affords us a striking example of a people living under a promise of exemption from disease so long as they should adhere strictly to the Divine Ordinances.† From the period at which the Jews entered the

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Dr. Guy contends that the aristocracy of England are shorter lived than the working-classes. He says that, at 30 years of age, the aristocracy have an expectation of 31 years. The expectation of all England is upwards of 34 years, while that of the agricultural labourer is nearly 41 years. This comparison, however, appears to be scarcely a fair one. To obtain sufficiently numerous data, shewing the average duration of life among the nobility, it is necessary to refer back at least half a century. It is well known that, several years since, there were causes strongly operating to diminish the expectation of life among the wealthier classes, which causes have, of late, greatly diminished;—take one, for instance, the immoderate use of wine, and its almost direct consequences gout and calculous disease. It can, therefore, be only fair to compare the mortality among the nobility of our own day with that which now prevails among the humbler classes: this, however, from the scantiness of the data attainable on the former point, can scarcely be done satisfactorily at present.

Some highly interesting facts have been adduced with regard to the low degree of mortality which prevails among that peaceable, temperate, and generally moral class—the Society of Friends, as compared with the English community at large. Some years since, a statistical enquiry was instituted into the ratio of deaths among the Quakers in several English countries; the results, as compared with the census of 1831, were given in a table which shews that among the people of England and Wales, 1 in 2·898207 died under 5 years of age; while in the Society of Friends, only 1 in 4·558538 died at that period of life. Between the ages of 20 and 30, 1 in 7·061931 died among the population at large, while the Quakers lost only 1 in 9·174392.

\* From Arphaxad to Joshua.

† Deut. vii. 14-15: "And the Lord will take away from thee all sickness, and will put none of the evil diseases of Egypt, which thou knowest, upon thee; but will lay them upon all them that hate thee."

The diseases alluded to are enumerated in Levit. xxvi. and Deut. xxviii. (where the infliction of disease is expressly threatened as the punishment of sin and disobedience),—as "terror; consumption, and the burning ague



promised land, under the above merciful dispensation, Scripture affords us no instance of ordinary spontaneous disease, or of natural death occurring previous to the expiration of the seventieth year, until after the lapse of 495 years, when the idolatry of Jeroboam brought the direct curse of premature death upon the royal House of Judah.\*

It is well known, even to the least instructed, that the causes which naturally lead to the extinction of human life, at the extreme period of senility, can scarcely be regarded as processes of disease. The cessation of man's existence, at the expiration of its full term, has been most accurately compared to the spontaneous fall of the ripened fruit from its wasting stem. Physiology detects the causes of both events in the gradual obliteration of nutritive vessels, and the consequent, almost imperceptibly progressive, deterioration of vital power.

The Physician, in reviewing the history of disease, can discover no form of painful or destructive malady which bears in itself the united characteristics of an *invariable*, *essential*, and *inevitable* portion of the Divine Plan in limiting the term of Human existence.

The various kinds of pestilence which have, in all ages, appeared to be the most direct instruments in carrying out the Omnipotent purpose, wherever a vast or a far-spreading destruction of human life has been judged necessary, have neither been permanent in their specific characters, constant or universal in their operation, nor—(except in those miraculous instances where death has been hurled forth as the direct judgment of Providence)—wholly insusceptible of limitation by human art.

With regard to all other diseases, not one unit of that multitude is found to have been equally prevalent in all ages; or to exist, in the present day, with the same intensity throughout all quarters of the globe; not one of their number can be regarded as essentially unavoidable or as absolutely insusceptible of either relief or remedy:—finally, there is not one among this host of scourges that is not demonstrably dependent, either wholly or in a

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that shall consume the eyes, and cause sorrow of heart; the pestilence; a fever; an inflammation; an extreme burning; the botch of Egypt; the emerods; the scab and the itch; madness and blindness; a sore botch that cannot be healed from the sole of the foot unto the top of the head"—"also every sickness and every plague which is not written in the book of the law."

\* 1 Kings xiv. 1—17.



large degree, upon artificial causes more or less directly resulting from human error or neglect.

Prophylaxis—or the means of anticipating and preventing various diseases in individual cases—has always formed a leading part of the Physician's duty; but the means of searching into the original causes of general diseases, and of preventing their development in the aggregate, constitute a new science, which, though still in its infancy, gives promise of assuming, eventually, a position—as a system of exact and essentially philosophic principles—far more exalted than our present art of treating disease in detail can ever attain.

In this age, sanitary reformers have learned that the only sure mode of obviating large classes of destructive diseases is to attack their causes at their very source. The great causes of pestilence are found to arise, death-laden, from morasses, and fens, and oozy alluvial flats;—to hover in the poisonous exhalations from fetid sewers, reeking slaughter-houses, manure heaps, and grave-yards, in which the dead are packed in bulk;—to spread from the destructive vapours which, issuing from chimneys, gas-works, manufactories, and crowded assemblies of human beings, hang like vast palls between our great cities and the sunlight;—to originate from the over-labour or the hopeless inactivity of large classes of mankind, their wants, their vicissitudes, their excesses, and their moral defects. The Physician of the present day teaches that all these, and many other fertile causes of disease akin to these, must be sought out and dealt with in the same vigorous and energetic spirit with which we may imagine the great Sanitary Reformer of Mythology opening the cleansing waters upon the Stables of Augeas, and exterminating the poison-breathing monster of Lerna's fen.

Unhappily, however, the means of remedying these evils are, at present, more apparent than attainable. We find all the agencies of nature continually working together for the removal of whatever is effete and noisome:—the elements and the lower animal creation at once attack it, and rid the living world of the dead offence—not by its actual destruction, but by converting it with beautiful exactitude, to Nature's uses. Thus do the fallen branch, and the body of man, when the spirit has fled, disappear from the face of the universe.

It is only now that we have begun to learn to imitate Nature in this respect, and to lend the aid of our energies to her endeavours, wherever the results of our own folly or neglect evidently overtax her powers. The knowledge



which must guide us in this ministration is daily accumulating, but the *Means* and the *Will* have yet to be supplied. When the people of any country will afford to lay out their riches upon the streets which they inhabit, and the ground upon which they tread, they may begin to hope that they, or their descendents, will long inhabit the land. When a fair proportion of the wealth, and energy, and labour, which are now devoted to mercantile speculations and to the arts of luxury have become invested in the bank of sanitary improvement, communities will discover that they possess interests of considerably more vital importance than those which are studied in their tables of interest; and will gain a vivid perception of the fact that the acme of mechanical philosophy lies in the perfectibility of the levers and pulleys of those greasy-faced and dirty-handed bodies with which they unceasingly toil for gold. They will then embrace the principle, of which they are unconscious now, that it is a greater and a better work to sustain a fragile constitution in healthy play, against all drawbacks, for three score and ten years, than it would be to discover a new motive power, or to achieve the quadrature of the circle.

It is not necessary to look deeply into medical lore to obtain abundant evidences of the *preventible* character of disease. Such evidences are found everywhere among the elementary facts of our science. Thus we notice that there are some highly-prevalent diseases which, although in themselves of a grave and dangerous nature, are subject to such easy prophylaxis, or to such ready and generally applicable remedies, that their attacks may either be obviated with great facility or be cured *in initio* with nearly absolute certainty. Small-pox and Intermittent Fever are among the most familiar examples of these two characters in disease. Within the last half century, vaccination has, in all civilised countries, almost entirely quelled the terrific power of the one,—the other diminishes yearly wherever the process of reclaiming marsh-lands advances; and its attacks, during the earlier periods of its course, yield readily to those simple vegetable tonics which nature has everywhere placed within the reach of the inhabitants of swampy districts. The Plague, Cholera, and certain other pestilential diseases are still retained as wide-spreading and often inevitable scourges; but even these evince a tendency to yield before the progress of habits of true civilisation. The one, like its terrible predecessor the sweating-sickness, has been virtually extinct in England and the more Northern parts of Europe for upwards of a



century and a half. The other has chiefly been confined to certain tropical districts, and remains within a circle which, providentially, it has overstepped only on two dire occasions since the year 1817; and we may be allowed to trust that, when the vast and fearful design for which it has been evoked shall have been wrought out, it too, at no very distant period, may come to be numbered among the extinct diseases. The development of Typhus and of all other pestilential Fevers is observed to be inseparably associated with impurity of atmosphere. Where there are no poisonous exhalations from marshes, drains, or other foci of animal or vegetable putridity, and where the air is fresh and uncontaminated, the true fevers never arise spontaneously; and, whenever they are introduced, in situations where these elements for their development and support are wanting, their attacks are comparatively light; and they either become neutralized at once or pass rapidly away.

It will require but little reflection or enquiry to enable the reader to place numerous other forms of dire constitutional disease within the category of one or other of the above classes; but sufficient examples have been cited to preface the axiom—that it is within the power of communities, and often of individuals, to adopt measures which, in their immediate effect, would restrain, and, in their eventual result, might wholly extirpate, the larger proportion of constitutional diseases.

Many data of highly suggestive importance, as bearing upon the *Removability* of Disease, are derivable from tracing out the history of the decrease or absolute disappearance of certain maladies which were once the gravest scourges of the human race; and from investigating the origin of others which still exist amongst us in all their original destructiveness. The very nature of that dire “Leprosy” which filled Christendom with Lazar-Houses from the tenth to the middle of the sixteenth century can now scarcely be determined.\* The

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\* According to Howitt, it has been conjectured that there existed in Europe, during the earlier portion of this period, no less than 15,000 houses for the reception of lepers. Whatever may be the truth of this supposition, we have evidence that, in England, there was hardly a large city or capital town near which there was not at least one of these lazarus-houses erected, the site of which is generally fixed, even at the present day, by the words “Spital,” or “Maison-Dieu,” which exist near all the old towns of the North. Owing to the infectious character of their inmates, these houses were never permitted to be within the walls of towns. Perhaps half the Hospitals in England were for lepers, so prevalent was the complaint. At the five gates of Norwich were five houses of this sort. Lepers were so numerous, in the twelfth



characters of the Black Death which, according to Villani, swept away three-fifths of the inhabitants of Europe, in 1346, is now traceable only in antiquarian records, and, perhaps, in the features of the Pali Plague, a pestilence which appeared in the North-West of India within the present century.\* Sweating-sickness appeared last in the British Isles in 1738.† Plague has been withheld from England since the

century, that, by a decree of the Lateran Council in 1179, they were empowered to erect churches for themselves, and to have their own ministers, lepers we may suppose, to officiate in them. So contagious was the leprosy held to be that, in England, where a man was a leper, and would come into the parish church among his neighbours, to talk with them to their annoyance, a writ lay *de leproso amovendo*.—*Fitzherb. Not. Brev.* pp. 520-21. This writ was for those lepers who appeared to the sight of all men that they were lepers, by their voice, and their sores, the putrefaction of their flesh, and the smell of them. And so late as the reign of Edward VI., multitudes of lepers seem to have been in England, for in 1 Edward VI. c. 3, in which directions are given for carrying the poor to the places where they were born, we read the following clause:—"Provided always, that all lepers and bed-ridden persons may, at their liberty, remain and continue in such houses appointed for lepers and bed-ridden people as they now be in." Camden says, "the disease, in the reign of Henry I., ran by infection over all England, and it is believed that it first came into this Island out of Egypt, and more than once had spread itself into Europe, first in the days of Pompey the Great, afterwards under Heraclius, and at other times, as may be seen in history, but never before that time, so far as I have read, did it appear in England." The principal Leper-Houses in London were—that founded by Matilda, Queen of Henry I., at St. Giles's in the Fields, about the year 1117, and the Hospital of St. James which, until the time of Henry VIII., occupied the site of St. James's Palace. This was founded for the reception of "fourteen sisters, maidens that were leprous, living chastely and honestly in divine service." The principal Leper-house in Paris was that attached to the convent of St. Lazarus, in the Rue de Faubourg, St. Denis. Probably, owing to a want of accuracy in discriminating the true characters of disease, many ordinary cutaneous affections were, of old, confounded with "leprosy," but it is evident that this scourge of Europe was a distinct disease of no ordinary severity, which was probably allied to the leprosy of India and to the Coco Bay of the West Indies. A very full and interesting account of the leprosy which is still rife around Damascus has recently been given by Dr. James Bowen Thompson (*Lond. Med. Gaz. May, 1851, p. 943*). M. Dulac has also contributed some particulars respecting this malady as it exists at Morocco (*L'Union Medicale and Lancet*), and Mr. Henderson has described it as fearfully destructive in the South and West of Iceland. In each of these situations the disease is regarded as contagious, but it assuredly does nowhere assume that awfully prevailing character which distinguished the "leprosy" of the middle ages.

\* Webb's *Pathologia Indica*, p. xxiv.

† In the spring of 1849, *La Presse Medicale* mentioned that recently at Mons the epidemics of small-pox and sweating-sickness had expelled the cholera. Some persons had been attacked with the small-pox, others by the sweating-sickness: the latter not being attended with danger, the former often fatal. It was added that, in Poland, the plague had expelled the sweating-sickness and small-pox, which had superseded the cholera. Here the sweating-sickness presented all the horrors by which it was characterised in the North of Europe to the end of the fifteenth century. Still more



year 1679.\* Scurvy is a disease which is scarcely to be met with in our Naval Hospitals.† Intermittent fever is no longer one of the gravest of English diseases. Sporadic cases of Puerperal Fever appear to be decidedly less frequent in the North now than they were in the middle ages.‡ Calculous diseases and Gout are ceasing to be hereditary with our

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recently, the disease is reported to have broken out with great severity in Montpellier and its vicinity, having attacked a large number of persons, many of whom have died in five or six hours.—(*L'Union Medicale*, May, 1851.) Later in the autumn of 1851, the Parisian medical journals reported the prevalence of this malady, epidemically in the Commune of Gramat (Cahors), where it had caused many deaths. The sweating-sickness appears to have occurred rather frequently on the continent during the last century.

\* This was the last year in which any deaths from the Plague were recorded in the Bills of Mortality; and, after the year 1704, all notice of this disease was omitted from the Bills.

† Scurvy appears, formerly, to have been the scourge of Northern Europe almost every winter. So great were its ravages in Denmark that, about two centuries ago, the Medical Faculty of Copenhagen published a "consilium" for the benefit of the poor in that country, giving an account of its causes, prevention, and cure. In Scotland it was prevalent under the name of "black legs." It is described by all the medical writers of the times, and all agree that it prevailed in the latter part of winter and in spring, and that it uniformly disappeared in summer and autumn.—(*Chambers*.)

The first decrease of this malady in the British Isles is by some considered to have been coincident with the introduction of the potato (which is certainly one of the most powerful anti-scorbutics) into general use as an article of diet. It was not, however, until Dr. Blair and Sir Gilbert Blane recommended the systematic introduction of lemon-juice, (the efficacy of which, Herschell observes, had been tested and proved as early as 1600 by Woodal) as an article of seamen's diet in 1795, that this disease found its remedy. The effect of this wise measure, (taken, of course, in conjunction with the general causes of improved health) may be estimated from the following facts. In 1780, the number of cases of scurvy received into Haslan Hospital was 1457—in 1806 *one* only; and, in 1807, *one*!

‡ This disease seems to have been very prevalent, in the early part of the sixteenth century, among ladies of the higher ranks. Elizabeth of York, Queen of Henry VII., died of puerperal fever nine days after the birth of the Princess Catherine, and after only two days' illness. Her death was so unexpected, that the Physician, upon whom the King depended for her restoration to health, was absent at his dwelling-house, beyond Gravesend, and it was in vain that Dr. Hallysworth travelled through the night with guides and torches to his royal patient in the Tower. Lady Boleyn, the mother of Henry the Eighth's Queen, died of this disease.—(*Lives of the Queens of England*.) It is by no means a decided fact that Queen Jane Seymour died from the effects of the Cæsarean section: those historians who declare that she underwent this operation are so palpably incorrect in some parts of their statements, that their authority deserves very little credit. The report of the Privy Council of the birth of Edward VI., still extant, affirms that she was "happily" delivered, and died afterwards of a distemper incidental to women in that condition—probably puerperal fever. An original document respecting the health of the Queen is still extant; it is signed by Thomas Rutland and five other medical men, and dated on the second Wednesday after the birth of the prince. "These shall be to advertise yor lordship of the Quene's estate. Yesterdaie afternonne profluvium naturale erat, by reason where-



aristocracy, under a wiser system of living than that which was prevalent among the rich antecedent to the present century. On the other hand, no perfectly satisfactory evidence can be adduced of the existence of Syphilis previous to a certain epoch in the fifteenth century. The presence of Cholera in India for a very long period antecedent to its outbreak at Jessore in 1817 has been strongly questioned.\* It appears impossible to trace out the existence of Phthisis,† as a generally prevailing disease, earlier than the latter part

of she beganne sumwhat lyghten, and (as it appeared) to amende; and so contynued till towards night. All this night she hath bene very sych, and doth rather appaire than amende. Her confessor hath bene with her Grace this mornyng, and hath done [all] that to his office apperteyneth, and even now is preparing to minister to her Grace the sacrament of unction, at Hampton Court, this Wednesday morning, at viii. of the clock."—(*Cotton MSS. Nero cx*) The Queen died at twelve o'clock that night, as we learn from a manuscript in the Herald's College; this "departyng was the twelf day of the byrthe" of prince.

Queen Catherine Parr died at Sudeley Castle, seven days after the birth of a daughter. It would appear, from the circumstances attending her decease, that she also fell a victim to puerperal fever. The absurd custom of the time, which compelled ladies to remain confined in their chambers for a month previous to their accouchement with a huge fire blazing on the hearth, and every door and window closely hung with heavy folds of arras—a system almost precisely similar to that still adhered to by the Hindoos,—doubtless, in great measure, conduced to render this malady prevalent.

\* The author of an excellent article on the "Origin, Progress, and Mortality of the Cholera Morbus," published in the "*Times*" in the autumn of 1849, states that cholera first made its appearance in 1781 among a body of 5,000 troops stationed at Ganjam on the Madras coast. On the third day more than half the army had either perished or were in the hospital!

† We have sufficient evidence of the existence of Pulmonary Consumption among the inhabitants of ancient Rome, but no proof is discoverable of the prevalence of Phthisis at that epoch.

The numerous existing records of the royal practice of "touching for the evil," from Clovis and Edward the Confessor to Queen Anne and Louis XVI, fully attest the antiquity of external strumous disease in the North.

It would appear that during the sixteenth century certain individuals of high rank fell victims to Phthisis; among others Magdalene of France, the first Queen of James V. of Scotland; and King Edward VI. who, we are told, sank from pulmonary disease a year after having suffered from measles and small-pox, which left a troublesome cough behind. The disease is clearly described by Wiseman, who wrote early in the seventeenth century; but without assurance of its remarkable frequency. It is mentioned, however, that in the reign of James I., foreigners complained of the universal coughing that resounded through every place of concourse, and that they considered Consumption to be a national disease of the English, produced by the wet and dirty streets of their metropolis.—(*Pictorial History of England.*)

It was one of the well-known crotchets of the ingenious Dr. Beddoes that our uncleanly ancestors were protected from Phthisical disease by the nitrogenized exhalations which everywhere surrounded them. One of the first instances of the employment of the expression which is now generally applied to England's greatest scourge is found in the register of burials at St. Giles's Church, Cripplegate, under the date of the 12th of November, 1674, "John Milton, gentleman, *consumcon*, cancell." It is not very pro-



of the sixteenth century. It is asserted that Scarlet Fever originated in Arabia in the sixth century; and that no record of Hooping-cough exists prior to 1510, when it prevailed fatally in Paris.\*

Lodge states that the Gout, then emphatically called "The Enemy," is said to have made its appearance in England with the increase of indolence and luxury in the reign of Elizabeth.† It has not yet been proved that the now so frequent association of cardiac disease with acute rheumatism existed previously to the year 1788.

All history and experience tend to shew that chronic constitutional disease is comparatively rare among people whose habits of life are "natural" or semi-barbarous. Among such cases, the pestilence or the sword have ever been the chief destroyers of life. It is only when "civilisation" and "refinement" with their countless attendant evils have set foot and gained ground that the more complicated forms of disease have become developed.

Highly valuable facts in illustration of the principle that no single species of disease or prevailing cause of death "forms an invariable, inevitable, and essential portion of the Divine Plan in limiting the term of human existence," may be gained from contrasting the more prevailing causes of death, as occurring among the inhabitants of temperate regions, with those which are most operative in tropical countries. The same diseases, for the most part, present themselves in either position; but the most frequent and destructive scourges of the one climate, are generally among the rarest and least fatal maladies of the other. Phthisis and other Pulmonary Affections, Typhus, Diseases of the Circulatory System, Struma in all its varieties, Puerperal Fever, Renal and Hepatic Disease resulting from intemperance, are among the most fatal causes of death in England and throughout the North of Europe. In Bengal, these diseas-

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able, however, that Milton died of true consumption, at an age of sixty-six. The expression was doubtless employed, in this instance, to signify a gradual emaciation and waning of the powers of life.

It is a well established fact that the introduction of English blankets first gave rise to the destructive prevalence of phthisis and of other pulmonary diseases among numerous tribes of the North American Indians.

A thoroughly elaborated history of the origin and progress of all known diseases is a great desideratum in medical literature.

\* Chambers's Papers for the People, vol. 2.

† Steevens quotes a remark by Eliot who, speaking of sack and rhenish, says—"The vintners in London put in lime, and thence proceed infinite maladies, especially the gouttes."



es are known; but they occur only as comparatively rare subjects of clinical observation. On the other hand, the analogues of the destructive and ever-present Endemic Fever, Dysentery, and Cholera of Bengal, must be classed among the minor causes of mortality in Europe. In the North, Epidemic Cholera has appeared but twice, within the knowledge of historians: and then only as a mighty invader from the East, every track of whose footsteps has been distinctly marked in his giant course across the world. Until about the beginning of the present century Dysentery occurred epidemically with considerable severity in England, Ireland, and the other northern countries; but its development appears latterly to have been opposed by the gradual redemption of marsh-lands, and by increased commercial prosperity leading to the cheapening of wholesome provisions.

Essentially, the pathology of all disease may be nearly the same in London as in Calcutta or Port Royal; but there are few things that would more surprise and perplex a really well-educated medical man—a native of India—than observing, upon his first initiation into the practice of our Metropolitan hospitals, how infinitely more prevalent and more complicated severe chronic diseases are in England than he had found them to be in his own country.\*

It is to be feared that Physicians will have a far less prominent and active share in the honorable task of bringing about the saving results of that Sanitary Reform of which they themselves have been the sole originators, than their wishes and their exertions undeniably claim for them. Medical Men are too strictly engaged in the personal and laborious details of their profession, in the hard competition for individual subsistence, and in the application of the laws of medicine to particular cases, rather than to more extended measures for the public good, to be enabled to carry forward any very enlarged views for the improvement of national sanitary laws. The Physician's own means of action are so

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\* "Some," says Sir Thomas Browne, "will allow no disease to be new; others think that many old ones are ceased; and that such which are esteemed new will have but their time; however, the mercy of God hath scattered the great heap of diseases, and not loaded any one country with all. Some may be new in one country who have been old in another. New discoveries of the earth discover new diseases; for besides the common swarm there are endemical and local infirmities proper unto certain regions, which in the whole earth make no small number; and if Asia, Africa, and America, should bring in their list, Pandora's box would swell, and there must be a strange pathology."



narrow, and his personal influence with those in power so limited, that he, unaided and alone, can effect but little in the execution of the good work. It has been, and it is still, his task to design all that is now effected and all that may yet be achieved in the great victory of science and true civilization over disease; but the fulfilment of his best intentions rests with others; and he must be prepared to find that when, under his guidance, the difficulties of the task have been surmounted, his part in the work will be viewed rather as that of a shrewd and ingenious artificer or trader than as that of a Christian Philosopher who, in the midst of his own trials, and in direct contravention to his own lower and temporal interests, has employed his dearly-bought knowledge in advancing the welfare of mankind.

Although it is an unquestionable fact that the progressive advance of medical science has, in the course of ages, greatly diminished the severity and prevalence of disease, it appears highly improbable that the cultivation and practice of medicine alone will ever have the power of carrying onward this beneficial influence beyond a certain, and that a very limited, extent. Almost innumerable causes must always concur to restrain the Physician's victory over disease. The influence of localities; of national and individual habits; of acquired constitutions transmitted from remote periods, and with infinite modifications, through various races, combined with a multitude of other circumstances subject to the irresistible law that all flesh must perish, altogether prevent medicine from ever attaining the footing of an exact science; and in the absence of this exactitude, the treatment of every case must necessarily be, in a measure, either empirical or experimental; and, consequently, its result will remain uncertain. The immense scope of the science of medicine, the multiplicity of its facts, the obscurity attendant upon nearly all its details,—giving such an almost unbounded latitude for speculation, which is always open to error,—and the incalculable number and variety of the complications which diseases present, must always, it is to be feared, leave the sagest and most experienced Physician, even at the close of his ministration, in the condition of a mere sifter of principles and seeker of truths.

It is, indeed, not improbable that, since the origin of medicine as a science, the whole of the great leading secrets, both in the nature and treatment of disease, have, from time to time, and in isolated portions, fallen within the possession of medical men at large; but, notwithstanding the voluminous



character of our literature, that knowledge has been so scattered in various ages, and countries, and hands; short-sightedness and oblivion have concealed so much; so many great truths have been known only to a few; so many have died with their discoverers; that the actual advance of the science has been tardy, and, for every single fact gained, it is to be feared that a hundred have been lost. Still, even now, it is probable that, could any man be found with industry, and discrimination, and years sufficient to collect from the mass of our literature all that which is really true and useful with regard to disease, he would at length, in the possession of that knowledge, be capable of at once giving an advance to his science greater than it has received during the last two thousand years. But this can scarcely be:—the knowledge is at hand, is stored in libraries, in museums, and in men's minds; still prejudice, doubt, limited capacity, and, it may be, the will of Providence, oppose an insurmountable barrier to him who essays to grasp it as a whole. The hidden power of mitigating disease appears to rest with man himself, less as a scientific than as a rational and a religious being: and he will find its developement in resources which are perfectly open to him,—in the improvement of the laws of nations and of societies; in the establishment of true religion and morality; in the rebuilding of cities, and in the improvement of lands; and in a careful adherence to those beautiful and easy laws, prescribed by nature for the regulation of mind and body, which still remain within the reach of all. It is undoubtedly with these, and not with the science of Physic, that the key to the Great Arcanum rests. The Physician may do much towards effecting the consummation of the good work; but the Law-giver, the Divine, and the General Philanthropist, aided by the consent of each man's better nature, could do all.

It is by no means impossible that at least within a few generations it might lie within the power of man to prolong human life to its utmost natural limit. Still it is not at present when the initiatory steps towards the attainment of this object have scarcely been made, that we can reasonably calculate how far it may ultimately be carried out, or even how soon its first successes may be achieved. The efforts of a century might well be devoted to the addition of a single year to the present average term of human existence. It may reasonably be a matter of doubt whether, after the progressive deterioration of ages, the lives of the degenerate races of men in civilized countries could ever be again extended, by mere



unaided science, to the original term of seventy years: each generation must be content with the great and telling results which may always be anticipated from well-directed efforts sedulously followed up, with the important end constantly in view.

The writings of English Statisticians are replete with calculations by which it is attempted to shew the precise amount of mortality that occurs annually, within our Registered Districts, from *Removeable Causes of Disease*.\* These statements, however, must not be received as absolute practical

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\* Thus, it was stated, in a Sanitary Report for 1844, that "the annual slaughter in England and Wales from preventible causes of Typhus, which attacks persons in the vigour of life, appears to be *double the amount of what was suffered by the Allied Armies in the Battle of Waterloo*."

Again, it was found, by Dr. Lyon Playfair, at about the same time, that there were, in Manchester every year, 3147 deaths above what ought to occur, if that town were placed under the same circumstances as other localities in which mortality is at the average of the whole nation. Of these 1908 were persons above twenty. Every person in Manchester may thus be said to lose about nineteen years of his life; that is, of the life he would enjoy if residing in a place of average mortality. Reckoning the industry of the 1908 persons at only 10 shillings a week. Dr. Playfair calculates that there is, from their deaths, and from preventible sickness in Manchester an annual loss of £981,189, or nearly a million sterling.

The Report of the Health of London Association shews that, in 1846-7, it was estimated that *under due sanitary regulations* the lives of 10,278 persons in the metropolis might annually be saved, and 287,784 cases of sickness be avoided. These deaths and illnesses were over and above what were due to natural causes; they were unnecessary deaths and unnecessary illnesses. "Verily," exclaim the reporters, "twice the loss of life occurs to the inhabitants of the metropolis annually which occurred to the gallant soldiers who were massacred and perished in the retreat from Cabool; yet, while a cry of lamentation was sent up by the whole country for their disastrous fate, no sound is raised for the victims of a cruel negligence and a disgraceful apathy. One-sixth of the total waste of life and health which takes place in the United Kingdom occurs in the metropolis:—now waste of life includes unnecessary sickness, widowhood, orphanage, [Mr. Chadwick calculated that in 1840 nearly 27,000 cases of premature widowhood and more than 100,000 cases of orphanage within the poor law Unions were ascribable to removeable causes,] funeral expenses, inability to labour, and medical charges; it also includes the cost of the increased relative proportion of births which is found to result from a high rate of mortality, and likewise increase of poor-rates, additional calls on public and private charity for the support of hospitals, dispensaries, and asylums for the sick and infirm. If an estimate is made of the money value of the losses from a neglect of sanitary measures in London; and if a detailed estimate of Dr. L. Playfair, for Manchester, is proceeded upon, it is found that £3,204,531 are wasted every year."

Previous to this Dr. Guy (as quoted by Lord Morpeth) had made the following statement of diseases which occasioned the excessive mortality of large towns in England and Wales. Deaths in 1,000,000 from small-pox, country 500, town above 1000; from measles, country 350, town 900; scarlet fever, country 500, town 1000; typhus, country 1,000, town 1,250; epidemic and contagious disorders together, country 3,400, town 6,000. Waste of life in towns under this head, 2,600 a year. Diseases of



guides:—they are highly important, as giving the sanitary reformer a view of the task which lies before him, they are also of great utility in shewing the comparative prevalence of certain descriptions of preventible disease in various localities; but they generally have the, at first sight, paradoxical fault of at once laying too much and too little stress upon our means of removing or preventing disease:—that is to say, they take too much for granted the perfect removeability of certain diseases, while they appear to overlook entirely the removeable character of certain other causes of death of nearly equal prevalence.

infants,—Teething, Convulsions, Water in the Head, country 1,300, town 3,500. Waste of infant life under this head, 2,200 a year. Scrofulous diseases and consumption, country 3,800, town 4,600. Total excess of deaths, 5,500 in the million. So that there was a waste of 22,000 lives in the 4,000,000 inhabiting large towns of England. The total number of deaths in England and Wales during the year 1841, was 343,847, or somewhat less than 1,000, a day. Now, this is at the rate of one death in 46 inhabitants. But if instead of one death in 46, there had been 1 death in 50 inhabitants, or 2 per cent, no less than 25,407 lives would have been saved.

Dr. Lyon Playfair calculates that, for every unnecessary death, there are 28 cases of unnecessary sickness; consequently in our large towns there occur above 700,000 cases of unnecessary sickness.

The last Return of the Registrar General (to the end of the quarter ending December 31, 1850) contains the remark that "The towns (of England and Wales) to every 4 deaths from what may be called natural causes, lost, in a favorable season, 1 life by the poisons generated in crowded dirty houses, in the churchyards, in slaughter-houses, and in sewers and undrained streets."

As the following pages will be replete with instances practically demonstrative of the preventible and removeable character of many grave forms of disease, it is merely necessary to cite one or two examples here, as shewing respectively, the protective influence of police management, and of extended systems of medical prophylaxis.

It is noticed, in the Registrar General's Return for the quarter ending Sept. 30th, 1851, that no person has died of *Hydrophobia*, in London, in any summer quarter since 1843. The deaths from that cause in the 6 years 1846-51, were 3; in the 6 years 1840-5 they amounted to 15; in the year 1839, to 4; in 1838, to 12. The decrease of this dreadful form of disease, it is suggested, may be fairly ascribed to improved police regulations.

In their report for 1849, the General Board of Health state that Dumfries had suffered more severely from the *Cholera*, on its invasion in 1832, than perhaps, any other town in Great Britain; and as soon as the disease was threatened in 1848, the Board, knowing that little sanitary improvement had been effected in the interval, and consequently, that the inhabitants must be in as great danger as before, directed the attention of the local authorities to the necessity of adopting a preventive system—but in vain. At its commencement, the disease went on committing its former ravages. Within the first twenty-nine days after its outbreak, there occurred 269 deaths out of a population of 10,000. No efforts being made on the part of the local authorities to check this great mortality, the Board sent one of their medical inspectors (Dr. Sutherland) to organise a plan of house-to-house visitation, to open dispensaries for affording medical assistance by night as well as by day; and to provide Houses of Refuge for the temporary reception of persons living in filthy and over-crowded rooms, where the disease



In reviewing the whole catalogue of the morbid and other influences which destroy human life, there will be found scarcely one that is not, in a greater or less degree, Removeable, Preventable, or Avoidable. A mere introduction to the subject like the present can only admit of the discussion of a few of the more prevalent of these fatal agencies.

Taking it, however, as a broad principle that all diseases are, to a certain extent, susceptible of being Removed, Prevented, and Avoided—it is necessary, for practical purposes, to draw a somewhat wide and arbitrary distinction between Removeable or Preventible—and Avoidable causes of disease or death. Applying the former terms to those destructive influences which the united endeavours of communities can alone effectually obviate, by extensive systems of sanitary reform and improvement: and employing the latter expression in designating those influences injurious to life, which, subject as they may be, in a general way, to mitigation or removal by legislative or social rules, are principally avoidable by the adoption of judicious systems of living in individual instances. Thus, Typhus and Intermittent Fevers, Small-pox and Scurvy, hold a foremost place among those diseases which, being liable to occur upon a vastly extended scale, are essentially “Removeable” only by enlarged systems having their origin in the Government of the country in which they are found to prevail. Cleanliness in cities; the extensive drainage of marshy districts; the general diffusion of vaccination, and the proper feeding and clothing of the inhabitants of ships, barracks, poor-houses, and prisons; are matters which a legislature can alone effect. On the other hand, we find that Syphilis, Visceral Disease consequent upon the immoderate use of ardent spirits, Death from Injuries sustained in carrying on extensive traffic, building, &c., and the mortality which arises from any unwholesome trades and occupations—although all of them influences which are, unquestionably, more or less

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was prevailing, and who, though not attacked, were likely to be the next victims. The result of the adoption of these measures was, that, on the second day after they were brought into operation, the attacks fell from 27, 38, and 23 daily, to 11; on the fifth day they diminished to 8; on the ninth day, no new case occurred; and in another week, the disease nearly disappeared. That this remarkable and rapid cessation of the disease was not the consequence of the natural exhaustion and termination of the epidemic, is proved by the fact, that the premonitory diarrhœa did not diminish proportionally with the diminution of cholera; but that, on the contrary, while cholera steadily decreased, diarrhœa went on, and even increased, thus shewing the continued action of the epidemic poison upon the system; while the true cause of the diminution of the cholera was, that the visitors detected it in its diarrhœal stage, and at once arrested its further progress.



under the control of every Government, are, at present, to be regarded as essentially "Avoidable" only by those individuals who have both the will and the power to place themselves beyond the sphere of their operation. In like manner, Phthisis and most other Pulmonary Diseases, Struma, the graver affections of the Circulatory Apparatus, and Epidemic Dysentery and Cholera, although each of them, in a certain degree, subject to the control of judicious legislative measures, are rather avoidable by individuals than by communities. Emigration from the countries in which these diseases are severally most prevalent affords the surest prospect of avoiding their destructive influence; but a measure of this kind must, of course, always be essentially partial in its operation.

The present state of our experience and knowledge of our resources, in reality, justifies us only in regarding the causes of death under which we now suffer as "Mitigable;" but encourage us in striving against them as though we considered them to be altogether Removable or Avoidable. A practical insight into the proportion of the Removable and Avoidable causes of death existing in a town or nation is obtained by comparing the usual amount of mortality in its unhealthiest quarter or province with that prevailing in its most salubrious district. Thus we find that, in 1850, the proportion of deaths out of 1000 of the inhabitants was, in London proper, 21·92. In the healthiest sub-district of the city, the number of deaths might be fairly rated at 13·32 per 1000. At the same time, the extreme rates of mortality throughout the country (under the Survey of the Registrar General), were 14 per 1000 (in a district of Northumberland), and 33·5 per 1000 (in Liverpool).<sup>\*</sup> Facts of this kind are highly valuable, as suggestive of the necessity of carefully observing, and of deducing practical lessons from the favorable condition of certain districts, and of endeavouring to remove the injurious influences under which others suffer:—still they must not lead us into the error of supposing either that the lowest present rate of mortality prevailing in a given district represents the utmost degree of health that might be attained there under the most successful operation of Sanitary Laws; or that the sanitary condition of all the districts of any given country can ever, under the present system of society, be brought to the standard of that in which the lowest amount of mortality even

<sup>\*</sup> Annual Report of Mr. Simon, Medical Officer of the City of London, for 1850.



now prevails. There exist an infinity of almost insuperable physical and moral causes which, at present, render it, humanly speaking, impossible that the mortality of all London should be reduced to the scale of the healthiest district of Northumberland: or that the hard-worked, ill-fed, intemperate and anxious denizens of Bermondsey and Whitechapel should be rendered as free from the influence of removable causes of disease, as are the more favorably (still not *most* favorably) situated wealthier portions of the inhabitants of St. George's, Hanover Square, and St. James's, Westminster.\*

However strenuously and convincingly English writers may have laboured in advocating the great cause of national health, it remains as a deplorable and undeniable fact that the actual progress hitherto made in advancing enlarged systems of Hygienic conservancy throughout the British Isles is exceedingly small, as compared with the national resources. Much that has tended to enhance the health and comfort of nearly the entire population, as well as of particular classes, has been achieved, and more is in daily progress: but it is painful to observe how little of this benefit has accrued from purely philanthropic endeavours for the public good, apart from all consideration of personal or municipal pecuniary gain. It is not less discouraging to notice how stubborn an obstacle any danger of pecuniary loss or outlay still throws in the way of the most vitally important sanitary movements, urgently called for as they may be in times of threatened danger, or even when devastating pestilence is at its direct height. Indeed, it has become a part of the duty of the sanitary legislator to prove first, that the working of his projects will be profitable in a monetary point of view,—and next,—that it will be salutary. Town Councils and other local authorities have, for the most part, learned to rest tranquilly un-

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\* Even in these, which are, upon the whole, nearly the most fortunate districts of the metropolis as regards the total average proportion of deaths to population, the very extremes of squalor and luxury meet. A few years since Mr. Toynbee, referring to a house-to-house visitation by Mr. Weld in the parish of St. George's, Hanover Square, mentioned that there were in the parish 1465 families of the laboring classes, who had for their residence only 2175 rooms, and 2510 beds. It appeared that 929 families had only a single room, and 408 two rooms. With regard to beds, 623 families had only 1 bed per family; 638 had 2 beds; 153 had 3 beds; 21 had 4 beds; 5 had 8 beds; 6 had 9 beds; 7 had 10 beds; 7 dwellings had no bed; and 10 were not ascertained. Where this state of things exists, it is customary to let half or a quarter of a room to a family; each has its corner. Under such circumstances, it is not singular that, here, the average age of the laboring class is only 27 years, while that of the gentry, their neighbours, is 45 years. Even the last number however carries with it a sign of "the knave galling the courtier's kibe."



der any amount of medical argument and popular outcry for sanitary reform as a measure of humanity,—but, whenever it can be announced to a trading body that the burning of their manufactory smoke will entail a saving of fifty per cent in the consumption of coal (leaving the item of pulmonary consumption altogether in the background)—that the abolition of intramural interment in their town will be tantamount to the saving of a million a year—each human life sacrificed under the existing practice, valuing on an average at so many pounds sterling; or that the richest source of Guano lies, not at distant Ichaboe, but in the unflushed sewers which fumigate their own domiciles;—the stolid eyes appear to open, and the arithmetical minds begin to perceive something really valid in schemes which involve economy—not of health but of money: and which, in offering assurance of prolonged life give promise also of the formation of companies with all their delightful associations of capital, dividends, treasurerships, directorships, and public dinners. Fortunately for the advocates of Hygiene, sanitary reform is absolutely identified with financial prosperity; and, since in this respect at least, national enlightenment appears not to have reached its culminating point amongst us, it must be considered sufficient if the municipal corporations of England will consent to cultivate the public health upon the broad principle which leads men to be honest for the sake of good policy, and religious on the score of respectability.

A brief sketch of the antecedents of that fearful epidemic Cholera which devastated the British Isles in 1849 will best shew how far a practical system of sanitary reform has gained ground amongst us.

In the year 1832 there occurred a pestilence, throughout England and Ireland, which attacked 116,602 of the population, and swept away 41,794 lives: of these numbers, there occurred in London alone 11,020 cases and 5,273 deaths.\*

The passing of the “Cholera Prevention Act” was the only national sanitary measure which this terrible warning called forth. That ordinance however was found wanting when next its salutary provisions were most required—it had been allowed to lapse in 1833.

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\* Copland's Dictionary of Pract. Medicine: vol. iii. part 1. Art. ‘Pestilential Cholera.’ 1845. The statement made to the Privy Council gives the number of attacks in London as 14,144, and the deaths as 6,729. In England and Wales the attacks are here stated to have been 71,600 and the deaths 16,437—*Board of Health Return*.



In the summer of 1846 it became publicly known, as a matter of certainty, that the Asiatic Cholera was again slowly, but steadily, advancing from the east towards Europe, in a path not very far removed from that which it had taken in 1830-31. Let us pause for a moment to enquire in what manner London,—that great rallying point of European Science,—stood prepared to meet the coming trial at this period,—how far the national proverb “forewarned forearmed” served its masters here.

Theoretically, the subject of sanitary reform has never been more thoroughly understood than it was in the year 1846. The investigations of Southwood Smith, Watt, Playfair, Guy, Chadwick, and of many other scientific men, (forming the principal portion of the evidence elicited by the Sanitary Commission of 1843), had clearly demonstrated the nature of the causes which tend to the developement and propagation of contagious and pestilential diseases in towns, and had accurately defined the means by which those causes may be lessened in activity or be entirely removed. The Reports of the Registrar General had rendered distinctly visible every step which destructive disease had taken amongst us within the preceding six years. The habitats of epidemic and sporadic maladies were absolutely defined:—it could be ascertained, with almost mathematical certainty, in what districts of any given town malignant fevers would first make their appearance, in which directions their subsequent ravages would be most severe, and consequently, the proportionate rates of mortality to be anticipated in this situation or in that. It had been shewn that, wherever deficient or imperfect drainage, collections of filth and offal, dense smoke, and other poisonous exhalations, a deficient or impure supply of water, and ill-ventilation prevailed, pestilential disease was ever liable to arise spontaneously, or, being introduced from without, to gather new virulence and to spread with the most destructive malignity. With a map of London or Liverpool opened before him, any well-informed medical man, tolerably acquainted with the localities, would then have been able to trace out, with nearly unfailing accuracy, the spots at which the known accumulation of these evils would determine the outbreak or add to the destructiveness of endemic or imported disease. Glancing over the same outline, the Physician found it equally easy to suggest the remedies for these evils. The draining of certain extensive and populous suburbs still furnished only with gutters or open ditches; the demolition and rebuilding of numerous districts



where fever was never absent;\* and where the houses, the air, and the inhabitants alike rotted together; the removal of huge cattle-markets and innumerable slaughter-houses from the very centres of the most thickly-inhabited quarters of the town—and generally, the prevention of intramural interments, the abundant supply of wholesome water, the consumption of the smoke, at least, that of all manufactories and public buildings—were among the most evidently indispensable measures required in a successful attempt to avert the menaced scourge. With these evils and their remedies thus in view, it would be difficult to suppress the exclamation—Oh for one year of the mighty Empire! Such causes of death would have disappeared before the well-directed labours of a single Roman Legion, as poisonous mists vanish before the uprising day. This, however, was not to be; the Government were not unwilling to act, but there existed no law in the land which could at once compel the public to sacrifice their present interests—or pecuniary profits rather—for the ultimate preservation of their lives; and thus it came to pass that the Londoners continued, as heretofore, to breathe their native composite atmosphere, to inter annually their sixty thousand dead within the precincts of their town, and by no means beyond the reach of their senses, and to illustrate, on a vast scale, the engineering blunder which a man commits when he leads his house-drain into his draw-well.

It was in this state of scientific enlightenment and philosophic indifference that the people of our doomed city awaited the coming of the pestilence. Some few efforts in the right direction were, however, made on the part of Government and private individuals. Early in 1846, the Health of Towns Bill was brought before Parliament. In June of that year, however, it was announced that the alterations proposed were so numerous that it would be necessary to withdraw the Bill and to substitute an entirely new one. Still in this year, an Act† was passed for the extension of sanitary measures, and the removal of nuisances. This measure acted tolerably well in detail; it led to the discovery and extirpation of many local sources of Malaria; but it achieved nothing towards the abatement of the general causes of disease which every where pervaded the metropolis.

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\* Report of the Health of London Association on the Sanitary Condition of the Metropolis, 1847.

† Contagious Diseases' Prevention Act. 9-10. Vict. chap. 96.



The Registrar General's Return for the week ending August the 8th 1846, presenting 37 cases of death from Cholera and 195 from Diarrhæa within the bills of mortality, occasioned considerable sensation and apprehension of the return of the pestilence of 1832:—but it was shewn that a certain proportion of cases of this kind had occurred annually in London during the past fourteen years;\* and, as the mortality from this cause speedily diminished, the stern warning, which the incident and its explanation alike conveyed, passed by unheeded, except by a body of gentlemen, principally members of the clerical and medical professions, who, in September of this year, formed themselves into the London Sanitary Committee, purposing to watch over the health of the metropolis with a view to protect it from *Cholera*, Typhus, &c., by a series of periodical reports, in the hope that Government and the local authorities might be directed to the necessity of adopting better sanitary regulations; it being the opinion of the medical members of the committee that one half of the diseases which then afflicted the metropolis resulted from bad drainage and sewerage, the filthy state in which the thoroughfares were allowed to remain, bad ventilation, and the defective supply of wholesome water. It does not appear, however, that this excellent intention led to any practical effect beyond the institution of an enquiry, and the eliciting of numerous facts fraught with stern and terrible warning.

In the session of 1845, a resolution had been carried in the House of Commons against strong ministerial opposition, to the effect “that the practice of interment within the precincts of the metropolis and of all large towns is injurious to the health of the population, and demands the serious attention of Parliament.” In 1846, therefore, Mr. Mackinnon, proceeding upon the data adduced by Walker, Chadwick, and other authorities, introduced a bill based upon this resolution. The measure, however, was withdrawn, at the request of the Secretary of State, with a promise that the subject should receive the attention of Government during the next session. Three years afterwards, when the Pestilence had accomplished its work of devastation throughout the length and breadth of the three kingdoms, this measure still hung in abeyance. Indeed, up to the present moment,

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\* In like manner it had been observed that, between the great plague of 1625 and the still greater pestilence of 1665-66, there occurred only three separate years in which the plague was altogether absent from London.



its provisions have not been carried into effect. Such was the position of affairs when it was announced that the Asiatic Cholera had entered Tartary and Persia, and the public were emphatically reminded that the Pestilence had occupied nearly these positions in the autumn of 1830; and that it appeared in England in the autumn of the following year.\* It was not a warning like this that could arouse the torpid energies of the Londoners, as in times of old when,—upon the first heralding of danger,—“with one cry, and with one roar the Royal city woke,”—the tidings fell almost unheeded upon the popular ear; they called into action none but the Physicians and the quacks.

The peril, however, was more remote than had been anticipated; and the interval of more than two years, which was mercifully allowed for preparation, was suffered to elapse, marked only by one solitary national defensive effort, and even this did not receive the fiat of Parliament until the long menaced storm was just about to burst.

In April 1847, the Health of Towns Bill was introduced to the House of Commons by Lord Morpeth. This measure was based upon the evidence of the scientific witnesses examined by the Sanitary Commission of 1843, and upon the published opinions of Dr. Southwood Smith, Dr. Guy, the Registrar General, and other statisticians; but it afforded no provision that members of the medical profession should be engaged in carrying its details into execution. In introducing this Bill his Lordship made the following strikingly seasonable remark. “Notwithstanding the improvements effected when cholera was last epidemic, the foul untrapped sewers, and the ground areas of the best streets, emit noisome smells and volatile poisons which are as fatal as arsenic to a certain number of persons. London is surrounded, too, by stagnant, putrid ditches, as some cities are by walls. It would be well not to wait carelessly until Cholera reaches the country, but to ‘look before,’ remove these nuisances, and purify the reeking atmosphere which gives the disease breath, life, and being. These remarks apply with tenfold force to Liverpool, Sheffield, and the towns of the north, where the epidemics in the last quarter were more fatal than they have ever been before, and diseases were, in proportion to the population, at least one third part more numerous than in London.”

In September, a Commission to enquire into the special means requisite for the sanitary improvements of the metro-

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\* *Times, Medical Gazette*, November 6th 1846.



polis, was issued, consisting originally of five members, only two of whom could be regarded as men practically acquainted even with the rudimentary principles of sanitary reform. This was essentially a deliberative body, it possessed no direct executive authority whatever. In the first week of February in the following year, the Health of Towns Bill, having undergone considerable modification, was again brought under discussion in the House, *the Sanitary Reform of the City of London being still reserved to be provided for in a separate Bill*. The measure now met with strong opposition, chiefly upon the ground of the "embarrassment likely to result from the creation of new offices, additional Government patronage, and a large increase of local expenses, without a corresponding amount of local regulation or controul." One opponent of the Bill even carried his adherence to that motto of antique conservatism "*quieta non movere*" so far as to declare that he "would keep to the old ways of the constitution, physical as well as political." The whole difficulty appeared to turn upon the question "will the rates be increased?" The cry was not—away with the pestilence which must sweep us from existence!—but—down with the measure that will tax our gains!—\*

It was not until the month of August 1848, at a time when Cholera was known to be raging with the most destructive intensity in Sweden, Finland, and Lapland, and when it was reported to have made its appearance in Berlin, that the 'Health of Towns' Bill passed the Lords and was submitted for the Royal assent. Early in the preceding June, an Order in Council had been issued instituting Quarantine measures with a view to prevent the introduction of Cholera into England.

Late in September, the General or Central Board of Health was organized, consisting of three of the members of the "Sanitary Commission," with a president, and two additional medical members. The Board held its first sitting

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\* In February the Metropolitan Sanitary Commission issued an excellent report displaying the perils likely to arise from the marshy and undrained state of large tracts of suburban land;— mentioning, among other details, that, in the Surrey district of sewers alone, there were nearly *seventy miles* of uncovered ditches and open watercourse complained of as being stagnant, as receiving house-drainage, and as giving off much offensive moisture. (As cited in the London Medical Gazette, March 3, 1848). The Commission published their first report in 1847; it contained many important facts illustrative of the Means which should be taken for the prevention of Cholera. They published two other important reports in 1848.



on the 27th of the month, after Cholera had made its appearance with more or less fatality, in nearly every part of the continent; and at the time when intelligence of the occurrence of a fatal case of the true Asiatic type in the Hotel Dieu at Paris, became known in London; when, indeed, it was rumoured that two men had died of the disease at Greenock on board a vessel lately arrived from Cronstadt. On the following day an Order in Council was issued, enjoining the immediate enforcement, throughout the whole of Great Britain, of the "Contagious Diseases' Prevention Act," which had been renewed and amended in the previous session of Parliament.

The disease presented itself in the Metropolis early in October. A few days only before the alarm of this event was given, the Central Board issued a code of instructions to the public, relative to the Treatment of Cholera. The administration of the Board occasionally met with rather severe criticism, but it is unquestionable that the gentlemen who composed it employed the extremely limited means which they had at their command with unsurpassable industry and with great talent;\* it will be observed, however, that, unless undue weight be attached to the influence of the previous counsels of the Sanitary Commission, the Board cannot be considered as having been organized with a view to *avert* the disease—they were called into the field simultaneously with it; and their after-acts can be regarded merely as unsuccessful efforts to stay an irresistible evil.

It was only upon the appearance of five cases of the disease in Edinburgh (at this time), that the College of Surgeons recommended the formation of a Local Board of Health—a

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\* It was decidedly an unhappy feature in the administration of the Board that they allowed their proceedings to be, in a great measure, influenced by the theory that cholera is not a contagious malady. Whether this doctrine be true or not, it is certain that the greatest error which Physicians have committed in modern times, has been that of obstinately ranging themselves under the two bitterly opposed factions of Contagionists and Non-contagionists. Speculation is open to all; but, while it can even be conjectured that every form of epidemic, endemic, and sporadic fever is,—or may, under certain circumstances, modifying and concentrating its virus, become,—essentially contagious—it would surely be right, that the man who argues most strongly, in his writings, against the contagiousness of a given malady, should vie with the most rabid contagionists in his precautionary measures, when he finds that the disease has actually gone forth to the slaughter. Medicine, in the hands of many, is still little more than a system of prejudices; not a few otherwise active intellects still sit down for life with their regards obstinately fixed upon the silver or the golden side of the bipartite shield, never dreaming of the enlightenment which they might gain by a single step to the right hand or to the left.



step which was adopted, about a week afterwards, under the superintendence of a member deputed by the London Board of Health.\*

Nearly consentaneously with the appearance of the disease in London, instructions were forwarded from the Board of Health to the Customs authorities at Southampton and other ports, to impose a quarantine of six days upon all steamers arriving from ports where Cholera prevailed. During this momentous week, the Common Council brought in a proposition for the appointment of an Officer of Health in the City of London. This measure was adopted in a liberal spirit, but not without an attempt, on the part of one of the members, to maintain that it was not essential that the Officer thus appointed should be a medical man! On the 18th of October a very able surgeon—Mr. Simon—was elected to this office.

On the 12th of October the College of Physicians appointed a Standing Committee, "for the purpose of inviting communications on the subject of Cholera, and, if necessary, of suggesting such measures and precautions as might appear expedient to insure the confidence and safety of the public."

Until January 1849, the disease advanced but slowly in London, and still more gradually in the Provinces. Up to the week ending January 7th, 756 cases and 240 deaths had occurred in the Metropolis, and only 511 cases, 247 of which had terminated fatally, throughout the rest of England.

From this period the disease gradually declined in London, until the months of April and May, when the number of deaths from Cholera was so small that the disease was considered "to have disappeared, at least for the present." In March 1849, the City Officer of Health recommended that no more burials should take place in one of the graveyards within his jurisdiction, seeing that the ground was now so full as, in his judgment, to prove injurious to the health of the neighbourhood. Previous to this, a meeting had been convened, by Mr. Mackinnon, with a view to urge upon Govern-

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\* It is mentioned in Chambers' "Sanitary Economy," that when the second cholera epidemic visited Edinburgh—"though there had been long warning, such was the insufficiency of the sanitary machinery, that not a sensible particle of the filth which festers in masses, or runs in thick disgusting streams through the city, had been removed. Indeed, it was generally observed, probably because people's eyes and noses were more acutely sensitive on that occasion, that when the cholera arrived, the Old Town was more deeply steeped than it had usually been in leathsome filth."



ment the speedy fulfilment of their promise to legislate for the closure of all graveyards in cities and towns. This, however, was not to be; the matter of burial fees presented an insuperable obstacle. The city Golgothas had increased in *height*, but not in breadth since the time of the great Plague;—still modern ingenuity could achieve much, and the modern system of packing the dead rendered the barbarous and unprofitable resort to plague-pits altogether unnecessary, however high the mortality should rise.

From the beginning of June, the number of deaths from Cholera began to increase in London. On the 11th of that month, the Board of Health issued an important notification, shewing that there was reason to expect a return of the disease, and enjoining cleanliness and caution. At the end of this month, it was announced that in the preceding week 124 fatal cases had been registered in London. It was remarked that “these cases chiefly occurred in the South and East of London, in low, crowded, and damp situations, where the sewerage is notoriously defective.” It was also suggested that the Cholera was pursuing the course which it followed in 1831-32:—in re-appearing during the summer season.\*

Up to the 5th of August, the disease increased in London with appalling rapidity; it had now reached its greatest height, the mortality of one week being no less than 2026! It was at about this crisis that we find the Commissioners of Sewers sending a notice to medical officers of the City Districts, enquiring whether the process of flushing the sewers had appeared to be attended with any marked aggravation of the disease in their neighbourhood. It seems that the sewers had not been properly cleansed previously to this, and it was suggested that to leave their contents alone would probably now be the safest course.

From this time, the number of deaths gradually declined week by week, until early in December, when the pestilence ceased in London.

Even then we find the “Society for the Abolition of Burials in Towns” still actively at work in “presenting a scheme for extramural burial as regards the Metropolis.” It appears certain that during the calamitous month of August 1849, nearly 5,000 Cholera subjects, or, including deaths from all causes, about 2,500 bodies weekly must have been—not buried,—but concealed beneath the soil of the Metropolitan graveyards.

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\* Medical Gazette, July 6, 1849.



When the Survivors began the reckoning of their dead, it was found that, out of a population of 2,206,076, about 30,000 persons had suffered from Cholera in the Metropolis:—and, of these, 14,601 had died. That in the Epidemic of 1832-33, one person died in every 250 of the inhabitants; whereas in 1848-9, one person died in every 151 of the inhabitants:—that, in fact, the mortality in 1832-33 was about two-fifths less than in 1849, which is the same as to say that, in proportion to the population, about 5,800 more persons perished in the latter Epidemic than in the former.\*

It was now very striking to remark that the chief virulence of the disease had been concentrated in the South and Eastern parts of the Metropolis, where the proportion of removeable disease is at all times excessive,—in those low, filthy, and uncared-for districts, upon whose wretched inhabitants it had been perceived, from the first, that the chief force of the pestilence would be expended. Thus we find it reported that while 1 in  $37\frac{1}{2}$  of the inhabitants of Bermondsey fell victims to the scourge, 1 in 263 died in the city proper; while only 1 in  $592\frac{1}{2}$  and 1 in  $643\frac{1}{2}$  died in the districts of Marylebone and St. James's Westminster, respectively.

Little more needs be added to this disheartening history of calamity tardily and ineffectually resisted, beyond the facts that the City of London have evinced their sense of the past evil by retaining their very able Officer of Health; and that in nine months after the disappearance of the pestilence, the citizens of Worcester had so far recovered from the shock as to decline, *on the plea of expense*, to appoint a medical officer under the Public Health Act.

Hereafter,—when men shall have learned the necessity of acting liberally, as well as scientifically, promptly, as well as energetically, in opposing the advances of preventible disease,—it may be perceived that, throughout this painful series of events, the people of England acted upon the type of rustics slumbering in heedless security at the brink of a swelling torrent, until the waters gradually rose upon them, when they awoke only to an attempt to bar the irresistible wave with hastily gathered clods and fragile sticks.

Although dealing here with principles, rather than details, it will be worth while to digress for a moment to observe how two of our large English towns have profited;—one by the warning given by the pestilence of 1832;—the other by

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\* Board of Health Return.



the sufferings of its miserable inhabitants during the visitation of 1849.

In 1832, *Nottingham* contained a population of 53,000; the situation in which this city stands is not particularly favorable; and it would appear that, at this period, its sanitary condition had scarcely received a thought. The whole area of the town was smaller, in proportion to the number of its inhabitants, than that of perhaps any other place in the kingdom. Its drainage was very defective; a number of thickly-populated streets were then unpaved and without sewers, and exhibited along their whole course pools of filthy water, or moist, extended, dung-heaps. The condition of the back-to-back dwellings of its poor was generally sordid in the extreme. In 1832 the Cholera made its appearance among the inhabitants of its noisome courts, attacked 1100 persons and destroyed 289; being 1 attack in 48, and one death in 183 of the population. Since this calamitous epoch, the town authorities have been sedulously occupied in improving the sanitary condition of Nottingham. The efforts of the Sanitary Committee, however, appear to have been chiefly instrumental in obtaining the following requirements for the town, during the three years prior to 1849,—a constant and plentiful supply of water (at the rate of 18 or 20 gallons per head daily); clean, dry, and well-drained streets and courts; an abatement of nuisances from various manufactures; and extramural interment to a considerable extent. The admirable consequences of this activity, together with the good effects of an energetic foresight on the part of the authorities, the influence of favorable public opinion and co-operation, and of prompt medical aid, were abundantly shewn by the fact that, at the end of September 1849, when Cholera was rapidly disappearing throughout the kingdom—there had occurred only eight cases of Cholera and six deaths from that cause in Nottingham. The three years' total expenses incurred by the Council, in working the Sanitary Committee, was about £150.\*

*Liverpool* has long been known as the unhealthiest town in the kingdom; its contiguity to the sea renders its position somewhat favourable; but the dead level of nearly the whole of its imperfectly-drained surface; the miserable squalor of its dwellings for the poorer classes; their crowding and ill-arrangement; together with the imperfection of its sewage and its water supplies, have combined to render it a

\* Report of the Sanitary Committee of Nottingham, Sept. 29, 1849.



focus of unceasing pestilence. These unfavorable conditions appear to be principally due to the rapid growth of the town;\* a want of inclination on the part of the authorities to adapt it to any other uses than those of trade; and to its liability to be inundated with multitudes of immigrant Irish, suddenly driven from their own country by famine or fever, for whom no accommodation could be afforded beyond that of numerous cellars or excavations in the earth, in which, not unfrequently, the number of inmates was merely regulated by the capacity of these dens to receive human beings in bulk.

In 1846 the population of this town was considerably over 3,00,000. Its average rate of mortality was 1 in 28-29, while that of London, with a population six times as large, was 1 in 37-39. The average age at death was, in Liverpool, 17 years, that in London being 29 years. The average age of its gentry was 35, of its tradesmen 22, and of its operatives 15 years. It was observed that, while the deaths under 5 years were 32 per cent in London, they were no less than 49 per cent in Liverpool. On the other hand, double the number arrived at the age of 70 in London that did so in Liverpool.†

About fifteen years since, it was stated that 35,000 of the inhabitants of Liverpool existed in cellars. It was estimated from the census of 1841, that the number of the working classes in this town was 1,60,000 who were distributed as follows:—In 1982 courts, containing 10,692 houses, the inhabitants were, in 6294 cellars, 20,168; in 621 cellars, 2,000. These houses and cellars were generally of the most wretched and filthy description, combining all the disadvantages of ill-ventilation, pestilential exhalations, defective drainage and crowding in an extreme degree. Occasionally, thirty individuals or more would be packed underground in a cellar which,

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\* Dr. W. C. Taylor finds that in 1662 the baptisms in Liverpool were 30, the burials 30; in 1700, baptisms 131, burials 125. (In 1773 Dr. Price gave the population as 34,407, the number of houses then being 6,340 or 5½ inhabitants to a house—a degree of crowding which the Doctor's table shews to have been exceeded only in Manchester and Salford; Bremhill, Wilts; and one of the Parishes of London). In 1800, the baptisms were 3,033, the burials 3,157.

The births registered in 1839, when a close approximation to correctness in the returns took place, were 7,128, deaths 7,437; in 1840, with a population of 2,23,054, the returns shewed 9,990 deaths to 9,925 births.

† Dr. Sutherland's Liverpool Health of Towns Advocate, Sept. 1845 to July 1846.



only containing 2100 cubic feet of air, barely supplied oxygen for the wants of *seven*.\*

During a few years preceding this time, the Commissioners of Sewers had expended above £100,000† in new sewers and paving:—still, a witness, cited by Dr. L. Playfair, declared as follows:—"There are thousands of houses and hundreds of courts in this town without a single drain of any description: I never hail any thing with greater delight than I do a violent tempest or a terrific thunder-storm, accompanied by a heavy rain; for these are the only scavengers that thousands have had to cleanse away the impurities and filth in which they live, or rather exist!"

The Cholera of 1849, of course, wrought a fearful destruction in Liverpool,—1 in 21 of the inhabitants fell victims to the pestilence. Rotherhithe, at once the most neglected and the most severely impested district of London, lost but 1 in 37½ of its inhabitants. The recently published reports of the Health Committee of the Town Council, however, shew that, since this epoch, the scavenger has been busily and profitably at work in Liverpool; we are told nothing of great improvements, it is true; but multitudes of offensive pools have been filled up, and the cleansing of unhealthy dwellings has been systematically pursued. The Sanitary Act contained an injunction for closing a large proportion of the cellars as dwellings, but without providing for the accommodation of the "surplus population" thus ejected; still, in 1849, no less than 1643 of these cellars were found re-occupied, requiring the interference of the police in removing their unfortunate inhabitants.

The results of these certainly very partial and incomplete sanitary measures have been remarkably encouraging. In 1850, the rate of mortality in Liverpool was reduced from 1 in 28 to 1 in 36. The condition of its wealthier inhabitants was nearly the same as of old, shewing merely the reduction from 1 in 41 to 1 in 42; but, in the poorer districts, where the mortality was formerly on an average 1 in 27, and, in some years so high as 1 in 14, it was in 1850, 1 in 30.‡

The favourable experience of a single year, and that year too one of unusual salubrity, immediately succeeding a year of pestilence, must not give rise to very sanguine expectations

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\* Dr. Duncan's Evidence before the Health of Towns' Commission.

† A certain proportion of which, however, appears to have been wasted in Parliamentary Expenses.

‡ Chambers' Edinburgh Journal, March 1851.



for the future; nor should it be forgotten that one death in 30 represents the highest present rate of town mortality in England. Still, such a record as this must be regarded as a strong encouragement to the hopeful employment of active sanitary measures, with a confident trust that wherever Zymotic disease is rife, there will the triumphs of cleanliness be most conspicuous.\*

It may now be trusted that the stern warning given by the last two pestilences have left an indelible and profitable impression upon the popular mind. The Cholera of 1832, certainly, had the effect of awaking the medical profession and conductors of the public press to the necessity of imitating our continental neighbours in their systems of public Hygienic conservancy: now the Government, the Profession, and the Press, appear to have combined in a determination to enlarge the operation of a thorough system of sanitary reform throughout the country.† It is gratifying to notice that an expression of opposition to all taxes "standing in the way of the sanitary improvement of the people" has taken its place among the other political pledges with which aspirants for Parliamentary honors assure their constituents of the enlightenment of their views.‡ In short, the experience of nearly ten centuries of civilization appears, at length, to

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\* As my object has merely been to illustrate the subject by a few selected parts, I have confined my remarks principally to the sanitary condition of two or three English towns. Numberless valuable data, evidencing the benefits derivable from sanitary reform, have been adduced in nearly every town in the United Kingdom. The statisticians of Scotland and Ireland have been in no way behind their English brethren in this respect, although subject to the extreme disadvantage of not having the standard of a Registration System. Still, the publication from time to time, of thoroughly comprehensive reports upon the sanitary condition of these countries from the pens of such investigators as Watt of Glasgow, Browne and Malcolm of Belfast, and Wilde of Dublin, would prove of inestimable value in advancing the good cause.

† The Parliamentary Session of 1851 was distinguished by the establishment, in the form of laws, of several of the fundamental principles of Sanitary Reform. The "Repeal of the Window Tax"; the "Restriction of the Sale of Arsenic"; the passing of the "Smithfield Market Removal Bill"; the sanction of the "Common Lodging Houses Act"; "The Metropolitan Sewers Bill"; the "Battersea Park Bill," and the "General Board of Health Bill," and the introduction of a Bill for the better supply of Water to the Metropolis, "mark this year as one of the most fortunate in our annals." The summer of 1851 also witnessed the first meeting of the "Sanitary Conference" at Paris, where it was announced that France, Great Britain, Austria, Spain, Sardinia, Greece, Russia, Turkey, Tuscany, the Roman States, the two Sicilies, and Portugal, had sent their delegates to unite in extending the great work of Sanitary Reform throughout the civilised world.

‡ Reports of the present Sir Robert Peel's speech subsequent to his election for Tamworth, January 29th, 1851.



have brought into a practical understanding of our proverbial doctrine that "Cleanliness is next to Godliness:" and to have convinced us that,—despite our national scrupulosity in washing our bodies and our garments,—the impure condition of our cities, and our neglect of the power which we possess of extending the benefits of cleanliness to those myriads of our poor, who now regard it as an almost unknown and unattainable luxury,—still leave us open to the imputation of being essentially a dirty people.

The history of all that was proposed and achieved in England, expressly with a view to the preservation of the Public Health, antecedent to the present century, might be comprised within a few sentences.

Jocelyn of Brakelond, the monk of St. Edmundsbury, gives us a singular idea of the sanitary condition of English towns in the twelfth century. He tells us,—“also the cellarer was used freely to take all the dunghills in every street for his own, unless they were before the doors of those who were holding *averland*; for to them only was it allowable to collect dung and to keep it. This custom was not enforced in the time of the Abbot Hugh, up to the period when Dennis and Roger of Hingham became cellarers, who, being desirous of reviving the ancient custom, took the cars of the burgesses laden with dung, and made them unload; but a multitude of the burgesses resisting, and being too strong for them, every one in his own tenement now collects his dung in a heap, and the poor sell theirs when and to whom they choose.” As late as 1648, Howel asserted that “in and about St. Paul’s Church horse-dung is a yard deep.”

In the fourteenth century two strenuous, but unsuccessful, efforts were made by the inhabitants of London to free themselves from the burden of the “Smithfield nuisance:” but even the royal prerogative failed to remove this evil, which was, thenceforward, destined to enjoy an uninterrupted lease of five hundred years.

Previous to the reign of Henry VIII, we find scarcely a record of a single attempt to cleanse any part of London from its reeking impurities, if we except a petition which the monks of Whitefriars made to the King and Parliament, in 1290, complaining that the putrid exhalations arising from the Fleet River were so powerful as to overcome all the Frankincense burnt at their altars, and even occasioned the deaths of many of the brethren. We find that in 1307, this pestiferous ditch was cleansed at the intercession of a powerful noble,—but only upon the ground that the accumu-



lation of its filths caused impediment to "navies and merchandizes." Once only did the "River of Wells" promise a benefit to humanity,—when its poisonous exhalations had nearly saved the venerable Hooper from the agonies of a fiery death.\* This ancient source of pestilence continued—

"With disemboguing streams  
Rolling large tributes of dead dogs to Thames."—

sufficiently long to receive its last evidence of public disgust in the pages of the *Dunciad*.

In 1531 a Commission was appointed "to survey the walls, streams, ditches, banks, gutters, sewers, gates, calties, bridges, trenches, mills, milldams, floodgates, ponds, locks, and hebbing wears" of London. It is stated that under this very Act, two of the seven lately existing Boards of Commissioners continued to exercise their powers.† Shortly afterwards, an Act for paving the principal streets of the Metropolis was brought into operation. There is scarcely another sanitary record of the sixteenth century, with the exception of that which notes the amercement of Shakespeare's father (six years previously to the Poet's birth) in the sum of four pence, for not keeping clean the gutter in front of his dwelling.

Erasmus, who was thoroughly acquainted with the condition of England at the commencement of the sixteenth century, attributes the developement of the plague and sweating sickness to the injudicious constructions and arrangement of the towns and houses, as well as to their filthiness within and without, and to the general marshiness of the country. He thus describes the London dwellings "(conclavium) sola fere strata sunt argillâ, tum scirpis palustribus, qui subinde sic renovantur ut fundamentum maneat aliquoties annos viginti sub se fovens sputa, vomitus, mictum canum et hominum, projectam cerevisiam et piscium reliquias, aliasque sordes non nominandas."‡

The fire of London was the great Sanitary Reform measure of the following century. Davenant tells us what London was previous to that fortunate epoch in its history:—"Sure your ancestors contrived your narrow streets in the days of wheelbarrows, before those greater engine-carts were invented.

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\* "On the one side of which prison (the Fleet) is the sink and filth of the the house, and, on the other side, the town ditch, so that the stench of the house hath infected me with sundry diseases."—Fox.

† Knight's *London*.

‡ Quoted by McCulloch.



Is your climate so hot that, as you walk, you need umbrellas of tiles to intercept the sun? or are your shambles so empty that you are afraid to let in fresh air lest it should sharpen your stomachs? Oh, the goodly landskip of Old Fish Street! which, had it not the ill luck to be crooked, was narrow enough to have been your founder's perspective; and where the garrets (perhaps not for want of architecture, but through abundance of vanity) are so made that opposite neighbours may shake hands without stirring from home."\*

Shortly, however, before the occurrence of the Great Plague, a legislative attempt (13 and 14 Car. II. c. 2) was made to cleanse London of some of its chief impurities.†

At the destruction of this picturesque, but rotten and noisome, city, the magnificent designs of Wren and Evelyn for its reconstruction were frustrated by "the obstinate aver-seness of great part of the citizens to alter their old properties, and to recede from building their houses again on the old ground and foundations; as also the distrust of many, and unwillingness to give up their properties, though for a time only, into the hands of Public Trustees or Commissioners till they might be dispensed to them again with more advantage to themselves than otherwise was possible to be effected." Hence, "the opportunity, in a great degree, was lost of making the new city the most magnificent as well as commodious for *health* and *trade*, of any upon earth.‡" Then, as now, it required a spirit akin to Wren's to place *health* before *trade* in a catalogue of national benefits.

In 1670, the public dunghills of London were at Mile-end, Dowgate Dock, Puddle Dock, and Whitefriars. The con-

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\* One of Ben. Johnson's plays represents lovers whispering gently to each other from their casements on opposite sides of the streets. The bazaars of Constantinople and Cairo, in the present day, shew that this style of architecture was of Saracenic origin, although it is as inappropriate to an Eastern as to a Northern climate.

† The preamble of this Act mentions that the highways of London and Westminster, "by reason of the multitude of houses lately built, and through the stopping and filling up the ditches and sewers; and neglect of timely reparations, are at present, and for some years past have been, so miry and foul, as is not only very noisome, dangerous, and inconvenient to the inhabitants thereabouts, but to all the King's liege people riding and travelling to and from the said cities." The measure, however, merely extended to the paving of some streets at the west end of the town, and to the widening of a few inconsiderable city thoroughfares. One of the clauses of this Act notices that, "great quantities of sea-coal ashes, dust, dirt, and other filth, of late times have been, and daily are, thrown into the streets, lanes, and alleys" of the Metropolis; and directs the inhabitants to sweep the streets in front of their houses twice a week, under a penalty of 3s. 4d. for every omission.

‡ Parentalia.



sequences were that disease and pestilence marked the city as their own.\* "One time with another," says Sir W. Petty, writing towards the close of the 17th century, "a plague happeneth in London every twenty years."<sup>†</sup>

The seventeenth century had the hitherto new distinction of producing two sanitary reformers,—or rather two advocates of sanitary reform,—unfortunately these appellations have never yet been altogether synonymous—in Sir William Petty and Charles Davenant: but, unhappily, the benefits offered to their age by these enlightened men are only to be discovered in their writings. Thirty-five years after the death of Davenant, the shrewd Satirizer of London's noisomeness, we find that (in 1750) the only avenue to the Houses of Parliament was in so miserable a state that fagots were thrown into the ruts whenever the King went to Parliament, to render the passage of the State coach more easy. It was in this year that the poisonous effluvia, issuing from the narrow, and for years uncleansed, Bail Dock and filthy dungeons of Newgate, destroyed the lives of about forty persons who were attending the trials at the old Bailey, not excepting the Lord Mayor, two of the Judges and an Alderman—a practical lesson to the authorities, which might have established an immediate confidence in the preservative virtues of pure air and fair water. A similar calamity had occurred at Oxford in 1577, when three hundred persons, who had attended the Assize Court, together with the Judge and Sherrieff, died from malignant fever propagated from the filthy cells of the prison. It is not necessary to take these facts as a standard in guessing at the then condition of the myriad of smaller courts and alleys of the Metropolis. An examination of the wretched purlieus of London, in the present day, will satisfy the enquirer what degree of squalor and noisomeness is compatible with a short and evil existence.<sup>‡</sup>

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\* Knight's *London*.

† This was certainly the case from the year 1593 to 1679. The bills of mortality shew that, in the first of these years, 11,503 persons died in London of the Plague. In 1603—30,061 fell victims to the pestilence. From 1604 to 1611 the annual deaths from this cause ranged from 444 to 4,240. From this time to the year 1647, the mortality from Plague was very great, rising in 1625 to 35,417; and in 1636-37, to 13,482. The 70,594 deaths which occurred in 1665-66 nearly closed the destructive history of this scourge in England; but a few deaths from Plague occur in the bills every year until 1679.

‡ Deplorably imperfect as the practice of sanitary measures was in ancient times, we have abundant evidence that the leading principles of our present Hygienic system were strongly inculcated by Physicians and other learned writers from a very early period. The letter from Erasmus to Dr. Francis,



It will not, we trust, be considered that the above literally "musty" records of old-world barbarism have been called up without a motive. The principal object of these pages is to suggest the necessity for an active sanitary reform throughout the whole of our possessions in the East: and, at present, it is only by knowing what has already been done, and what has yet to be achieved at home, that we can adapt

already cited, contains within a single page, the fullest and most luminous exposition that could be given of the influence of an injudicious style of building, imperfect ventilation, household and street filthiness, a poor fish diet, and a generally undrained condition of the country, in propagating the sweating sickness. In like manner, we have the nearly equally wise instructions of John Cay (1552) in his "Booke on Counsell" against the same pestilence. After recommending a wholesome and nutritious diet, this author adds, "I will advise and counsel how to keep the same" (the atmosphere) "pure for so much as may be, or less infected, and correct the same corrupt. The first is done in taking away the cause of infection; the second by doing in all points the contrary thereto. Take away the causes, we may, in damming ditches, avoiding carions, letting in open air, shunning such evil mists as before I spake of, not opening or stirring evil-breathing places, landing muddy and rotten grounds, burying dead bodies, keeping canals clean, sinks, &c., sweet, removing dunghills, box and evil savouring things," [The Rev. Thomas Vincent alludes to this erroneous notion in describing the Great Plague, "now roses and other sweet flowers within in the gardens, are disregarded in the markets, and people dare not offer them to their noses, lest, with their sweet savour, that which is infectious should be attracted."] "inhabiting high and open places close towards the 'south'" [For some centuries, a strong fear was entertained of

"Whatever baneful breathes the rotten South"]

"shut towards the wind, as reason will."

In 1602 a royal proclamation declared "that such great multitudes being brought to inhabit in such small rooms, whereof a great part being very poor, and being heaped up together, and in a sort smothered with many families of children and servants in one house, or small tenement, it must needs follow that, if any plague or other universal sickness should, by God's permission, enter among these multitudes, the same would spread itself."

The character of the sanitary measures which were adopted in London upon the outbreak of the Great Plague of 1665, affords abundant evidence that it was indolence, rather than absolute ignorance, which maintained the noisomeness of the Metropolis in those days. In 1663-64 Holland was severely visited by the Plague, and more than 24,000 persons are said to have fallen victims to its ravages in Amsterdam. In November 1663, all ships coming thence and from Hamburgh, where the Plague had also appeared, were enjoined, by an order of Council, to perform a "Quarantine" of thirty days in Hole Haven. In the following year, the Government prohibited the importation of merchandise from Holland, "on account of the Plague having been introduced into that country."—It appears that, in 1664 the number of deaths from Plague within the bills of mortality was six; one of these occurred in the month of December. Another instance was registered in February 1665, and two more at the end of April. From the second week in May the deaths continued to increase with fearful rapidity, until, in the third week of September, they amounted to 7,165. On the 13th May, a Committee of the Lords was formed by the Privy Council, for "Prevention of spreading of the Infection;" and by their order, certainly by no means valid, "Directions as well for the cure of the Plague, as for prevent-



our measures to the mighty task before us. India is, at this moment, decidedly behind England of the fifteenth century, in respect to the sanitary condition of its towns and villages; and is, of course, in natural advantages of climate, very many degrees less favorably situated, as regards the probable success of Hygienic laws. Still, it has become the principle of this age to seek out difficulties for the glory of overcoming

ing the Infection," drawn up by the College of Physicians, were issued in the form of a pamphlet. It appears that early in the visitation, Sir John Lawrence, the Lord Mayor, appointed Physicians and Surgeons for the relief of the diseased poor, and many medical men of the highest eminence volunteered their services. In June, (the weekly deaths having risen to 570), the Lord Mayor issued a proclamation, ordering the appointment of Examiners and Searchers, the strict closing and watching of infected houses, the "airing, with fire," and perfuming all such dwellings, with their bedding, hangings, &c.; regulating the depth of graves, the enforcing daily cleansing of the streets, the clearing away of filth from the houses, the removal of Laystalls "as far as may be out of the city," and prohibiting the sale of stinking fish, unwholesome flesh, and musty corn. It was also ordered that "no hogs, dogs, or cats, or tame pigeons, or conies, be suffered to be kept within any part of the city;" and very stringent restraints were placed upon wandering beggars, plays and public games, and feastings, as well as upon tippling houses and other places of idle resort. It was not until the 5th September, that recourse was had to the expedient of keeping large sea-coal fires constantly burning for three days and nights throughout the City and its suburbs. This was done at the recommendation of the Duke of Albemarle, but contrary to the advice of the Physicians; and, it would appear, with an awfully disastrous result—on the third night, rain fell and extinguished the fires, and, according to Dr. Hodges, more than four thousand persons perished before the morning. Upon the decline of the Pestilence, a variety of plans were had recourse to, with a view to "purge the houses and goods where the Plague had been." Large sums were laid out in the purchase of perfumes, resins, and other preparations, and the poorer people set open their windows night and day, burning brimstone, pitch, and gunpowder in their rooms. A few years subsequently to these events, Wren and Evelyn strongly protested against intramural and church burials, and insisted upon the benefits likely to result from the establishment of suburban cemeteries. Early in the eighteenth century, the writings of Mead fully demonstrated the influence of removeable local causes in occasioning the development of pestilential disease. Armstrong's celebrated poem on "The Art of Preserving Health," (published in 1744), enforced the leading principles of Hygiene, with a clearness and eloquence which left little but the task of amplification to those who have since written upon public health. Few years later, Mr. Dale Ingram published some remarks on contagion, in which the following opinion is given:—"The poor in all nations are first afflicted; for unwholesome meats, drinks, tainted flesh, stinking garbage, and uncleanliness, do not a little contribute to the propagation of pestilential distempers; for wherever there is a distemperature in the air, the human body is, by these causes, predisposed to receive the infection." We have here a plain enunciation of the most important principle in the control of pestilential disease by sanitary measures. Finally, between 1777 and 1789, the philanthropy and genius of Howard demonstrated the applicability of sanitary laws to the construction and ordering of Prisons and Lazarettos:—thus giving a practical commencement to the present system of arrangement in Barracks, Jails, Hospitals, and other buildings, in which large numbers of individuals are thronged together.



them :—and the field which lies open to English scientific enterprise in the sanitary improvement of this noble country, may well engage the energies of the best intellects during the remaining half century. It may never come within the power of man to remove those infinite sources of pestilence which lie in the vast jungles and marshy plains of Bengal. Still, it may be some encouragement to modern enterprise to remember that, in our own country, two hundred years ago, Intermittent Fevers and their allied disorders were as prevalent as they now are in Lower India, and scarcely less destructive in their ravages. In 1652 the casements of Windsor and Whitehall admitted, from the reeking flats of Eton and Lambeth, marsh vapours as poisonous as those which now arise on every side around the Anglo-Asiatic palaces of Garden Reach. If the narrow and neglected streets of old London could bring the seeds of the Great Plague into full developement, at a season when the fresh autumnal breezes were rushing down upon the city, laden with the scents of gardens, and harvest fields, and pleasant waters, much more will Cholera and Dysentery rise paramount out of the feter and decomposition which every where prevail in Indian Bazaars, during the intermission of the rains, when the sun scorches like a furnace, and the air is as still as the death which is impending. The records of the past direct us unmistakeably in the course which leads to the attainment of that most precious of the Divine Gifts—Long Life ;—and energy and liberality are alone required to secure that blessing,—if not for ourselves—assuredly for the fruition of those who surround us, and of those who are to follow us.

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## SECTION II.

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### THE MODES OF ENCOUNTERING REMOVABLE CAUSES OF DEATH.

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“Just notions will into good actions grow.”

“Et quoniam variant morbi, variabimus artes.  
Mille mali species, mille salutis erant.”

“Cuncta prius tentanda, sed immedicabile vulnus  
Ense recidendum est, ne pars sincera trahetur.”



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## REMOVABLE CAUSES OF DEATH.

### THE MODES OF ENCOUNTERING.

WE have seen that a large proportion of the deadliest and most prevailing diseases are the results of circumstances, which it is in the power of humanity to control, and, perhaps, eventually to remove altogether; that, although the universal gift of old age can be looked for only among the blessings of the promised millennium,\* the power of considerably extending the term of his existence lies tangibly within the grasp of man: and that this faculty of moderating the great causes of death rests with the Law-giver, rather than with the Physician.

We have now to consider some of the legislative measures and social rules which are obviously necessary for the diminution of the most prevalent causes of disease, and for the general prolongation of human life. The following appear to be the most requisite.

The encouragement of Emigration from over-populated districts to healthy and productive Colonies.

The embankment of Rivers, and the Draining and Cultivation of Marsh and Waste Lands.

The infliction of heavy penalties upon all persons found guilty of adulterating any Medical Drug, or any Article of Sustenance, or of vending the Flesh or Milk of ill-fed or diseased Animals.

Restriction in the Sale of Ardent Spirits and of other Intoxicating Drinks.

The proper Building, Ventilation, Lighting, and Drainage, of Houses,—particularly those of the Labouring Population.

The abundant Supply of Pure Water to Towns.

The proper Cleansing of all Streets and Thoroughfares.

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\* "There shall be no more thence an infant of days, nor an old man that hath not filled his days; for the child shall die an hundred years old."

"And they shall build houses, and inhabit them, and they shall plant vineyards and eat the fruit of them."

"They shall not build, and another inhabit; they shall not plant and another eat; for as the days of a tree are the days of my people, and mine elect shall long enjoy the work of their hands."—*Isaiah* lxiv. 20-22.

"But it shall not be well with the wicked, neither shall he prolong his days, which are as a shadow; because he feared not before God."—*Ecclesiastes* viii. 12.



The clearing, regardless of opposition or expense, of all confined and notoriously unhealthy districts of cities, and the partition of the spaces of ground, thus obtained, as the sites of appropriate dwellings for the poor.

Prohibition of the Intramural Burial of the dead.

The removal of all Cattle-Markets, Slaughter-Houses, Piggeries, Tan-yards, Gas-Works, &c., beyond the confines of Towns.

The general adoption of means for consuming the Smoke of Towns.

The erection of all extensive Manufactories at the distance of, at least, two miles from the confines of large towns : with the provision of their being constructed in healthy situations, with proper regard to security, ventilation, warming, &c.

Prevention of the Retail Sale of Poisons.

The suppression of all those Trades which, while they produce no substantial benefit to the community at large, entail almost certain destruction of life or health on those who practise them ; and the careful modification of all those useful trades or occupations which are attended with danger to health, or risk of life.

The due Remuneration of the Working Classes (especially in the manufacturing districts) ; and the Proper Limitation of their Hours of Labour.

The opening of Baths, Wash-houses, and Places of Exercise, for the use of the Working Classes in the vicinity of crowded cities, and in manufacturing districts.

The establishment, upon an extensive scale, throughout the country, of Houses of Temporary Refuge for the Destitute, where Medical Aid may be received, as well as Assistance in obtaining proper Employment.

The introduction of better and more liberal Rules, than are at present in operation, for the Medical Relief of the Destitute Sick ; and for the Support of Incurable Patients.

The establishment of judicious systems for the reduction of the mortality in Lunatic Asylums, Jails, and Workhouses.

The adoption of measures encouraging the Poor to bring their Children to be Vaccinated.

The employment of means tending to reduce the mortality among the Children of the Poor.

The maintenance of a strict Hygienic System among Sailors and Soldiers, at home and abroad.

The enforcement of a well-conducted System of Quarantine, whenever the introduction of Pestilential Disease is to be apprehended.



The strict prohibition of the Practice of Medicine and Surgery, as well as of the Sale and Compounding of Drugs, by unqualified Persons.

The gradual introduction of Regulations calculated to improve the *morale* of populous districts; and to diffuse religious and useful instructions among all classes of the people.—

Some of these provisions have long been in active, though partial, operation; and their beneficial effects are daily becoming more and more strikingly apparent; others are just beginning to work, and will have to be much extended in their application before they can produce their intended and destined good; the remainder, it is to be regretted, have yet to be introduced; but the time is not distant at which the absolute necessity for their adoption must become evident to all.

Each of these Requirements deserves a separate consideration.

#### I. *The Encouragement of Emigration from Over-Populated Districts to Healthy and Productive Colonies.*

That, in an over-peopled country, whose numbers are rapidly on the increase, where poverty is the rule and competence the exception, *Famine*,—in its greater or its less degrees,—with its invariable concomitant Pestilence,\*—or *Steady Emigration*, stand in the relation of natural and inevitable alternatives, is a proposition which is nearly as self-evident as the truism that five cannot subsist upon the food of two.

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\* In taking into review the circumstances that preceded or accompanied the most remarkable epidemic fevers which have occurred in Ireland during the last hundred years, Dr. Corrigan finds that, "however all other circumstances—as time, season, climate, might have varied, this one condition—famine—was never absent. No matter how climate altered, or seasons revolved; so surely as want appeared, so certainly did pestilence follow. The two have also kept pace with one another; as the degree of want, so has been the extent of fever." Dr. Corrigan is "fully convinced that it is far less immediately to the influence of climate, or season, absence of cleanliness, and crowded apartments, intemperance, or contagion, that the origin and spread of fever in Ireland are to be attributed, than to the baneful effects of famine." (*On Famine and Fever, as cause and effect, in Ireland: with Observations on Hospital Location and Out-Door Relief of Food and Medicine*, 1846.) The correctness of these views has been questioned, but not disproved, by Dr. Henry Kennedy. It is very certain that epidemic and endemic fevers of the most severe character may arise, in Ireland and elsewhere, quite independently of the existence of local or general scarcity of food: still, it appears to be undeniable that the depression of the mental and physical energies, the squalor, neglect, and exposure, which necessarily attend the prevalence of famine, are among the most influential causes of pestilence. The histories of all countries—and that of India most especially—afford abundant evidences of this fact.



The first census of 1801, shewed that the population of Great Britain amounted to about eleven millions. In 1851 the inhabitants had increased to 20,919,513. The census of this year, as compared with that of 1841, shewed that the population had augmented 2,263,550 within the decennial period, without taking into account the numbers lost by emigration. The total number of paupers of all classes relieved in the sixth week of the quarter ending at Lady Day, 1851, in England and Wales alone, was 8,70,034, exclusive of vagrants. In a country thus circumstanced, where, moreover, a very serious depression of the agricultural interest has placed the improvement of lands nearly at a standstill, it is difficult to regard the national prospects otherwise than in a Malthusian point of view, and to decide that, here, either rapid emigration, or an increased rate of mortality, appears to be absolutely unavoidable. Still, it is a fact well established by our political economists that, in a country possessing the inward resources of which England can still boast, it is at once unnecessary and impossible, that the amount of emigration should, by any means, equal the increase in the population. In such a case, emigration can only be expected to act as a safety-valve, by means of which the pressure of over-population may be moderately reduced. It appears, from an article published in Blackwood's Magazine in 1851, and from recent Parliamentary Report, that the total number of persons who left the United Kingdom as emigrants, from 1825 to 1850 inclusive, was 2,566,033, by no means a large deduction, even when compared with the increase of population in Great Britain during the last decade. Still, it will be observed that, by a wise management of her internal resources, Great Britain has, with her increase of population, acquired almost proportionably increased means of supporting her inhabitants. Thus we find that, at the commencement of this century, the poor-rates of England and Wales averaged £5,348,205 annually, from a population of less than nine millions; while, in 1849, when the population had risen to nearly eighteen millions, these rates amounted only to £5,792,963. Again, it has been shewn, that the total Government Revenue for the year 1822, was £54,135,743, while the Revenue for 1850 amounted only to £52,810,680:—that in 1822, the value of the Imports into the United Kingdom, calculated at the official rates of valuation, was £30,530,663, and that of Exports £53,464,123; while in 1849 the value of the Imports was £105,874,907; and that of the Exports £190,101,394. Further, between 1816 and 1846,



the United Kingdom has been relieved of taxes to the amount of £39,550,000 a year (*Edinburgh Review*, April, 1851). Still, a tolerably active emigration has certainly conduced greatly to the establishment of whatever is favorable in the present financial condition of Great Britain; and it cannot, for an instant, be questioned that an increased outflow towards the colonies must still be reckoned among the most urgent wants of the nation. It is, of course, a self-evident principle that, where famine comes upon a country, which owes its wealth mainly to a system of rigid economy in the levying and expenditure of public funds, the evil will fall, with extreme severity, upon the dependent classes of its inhabitants. In 1800, five bad harvests brought the price of wheat up to £5. 15s. 11d. per quarter, and, although, as we have seen, the proportionate amount of the poor's rate was far greater then than it is at present—wants, public dissatisfaction, and dangerous riots immediately ensued. In 1850, the average price of wheat was 40s. 2d. per quarter; but any extra press of want at that time could only have been met at the outset, by the contingent aid of voluntary public charity;—a species of assistance which must of course never be reckoned upon beforehand, when forming a practical estimate of the resources of any country.

On the other hand, Ireland has recently presented us with the probably unexampled instance of a country, ill furnished with available resources for the support of its poor, receiving an addition of upwards of 35 per cent. to its population within a space of thirty years: and then losing 20 per cent. of its inhabitants, by pestilence, want, and emigration, in the immediately ensuing decade. In 1811, Ireland numbered 5,937,856 inhabitants: in 1841, its population had increased to 8,175,124, while the census of 1851 returned only 6,515,794, shewing a decrease, within the ten years, of no less than 1,659,330 souls.\* The unfortunate want of a

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\* With nearly all the statistical data which have been adduced upon the subject spread before us, it becomes a matter of almost hopeless difficulty to decide what real amount of pauperism has existed in Ireland during the past ten years. Thus we have, first, the statement of the Poor-Law Commissioners, made previously to the establishment of the present system in 1838, that 2,800,000 of the inhabitants of Ireland were in a state of utter destitution. In like manner, it was asserted in 1845, that 2,300,000 of the people of Ireland were "in a state of destitution, or painfully supported by legal relief." (*Blackwood's Magazine*, No. 355.) "These statements were met in 1846 by the declaration that "not more than 68,000 could, in any one year, since the establishment of the Poor-Law, be induced to accept the relief which Parliament provided for them." (*Idem*. May, 1846.) In June 1850, however, we are told that 2,64,048 in-door, and 1,41,077 out-door, paupers



registration system in Ireland, as well as the uncertainty regarding the number of Irish who have emigrated from English ports, leave it doubtful how far this depopulation of the country has been the result of migration, and how far it has been due to destructive influences. Unquestionably, a very large proportion of this loss may be laid to the account of emigration. It has been stated, in a Parliamentary Return, that in 1849-50, 1,21,330 persons emigrated from the ports of Ireland alone, not taking into account those who embarked in England and Scotland; and it has been computed, approximatively, (*Thom's Almanac*) that, during the last three years, the total amount of Irish emigration has averaged 2,00,482 per annum. Still, we know that pestilence and want have committed fearful ravages in Ireland within the period in question; and most providentially has it come to pass that myriads of the population "out of the nettle danger have plucked the flower safety," by emigration to colonies, where their spirit and enterprise will find broad fields for exertion.

Recently, Mr. William F. Robinson, M.A., delivered a lecture at Clinton, N. Y., in which he shewed that in 1850, out of a gross population of 23,000,000, the United States contained no less than 7,500,000 Irish by birth or blood. On the other hand, a stream of energetic capitalists and able agriculturists is steadily passing from England and Scotland into Ireland, affording a fair promise of new resources evoking new energies in the breasts of that unhappy, but noble, race.

The main desiderata, in a properly-conducted system of emigration, appear to be,—

That its entire management should be absolutely under the control and watchful supervision of Government.\*

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were relieved from the Irish poor's rates (Third Annual Report p. 7.). Further, that "on the 3rd July 1847 (a time of famine) no less than 3,020,712 persons were fed by the public in Ireland." On the other hand, the following details appeared in the "Household Words" for June 1851—"a consequence of the extent of Irish emigration is apparent in the decrease of pauperism. The diminution in the number of paupers receiving relief is perceptible in almost every union in Ireland; and in some to a very remarkable extent. In Sligo, the decrease within the year is nearly to the extent of one half. The number in the house, on the 17th June of this year, being 1,975; while, on the same day of last year, it was 3,322." More consistent statements than these might be expected from "the very best authorities;" still, however difficult it may be to adduce a satisfactory account of her embarrassments, it is to be feared that we cannot regard Ireland otherwise than as a country in which "poverty is the rule, and competence the exception."

\* "There ought to be constant communication between the Home and Colonial authorities, as to the state of the colony, the field for employment, and the demand for labour. The intelligence supplied ought instant-



That it should be clearly ascertained, from time to time,—by that intelligence which a Government can alone obtain relative to the present condition of any foreign country,—whether the various localities to which the tide of emigration tends are capable of receiving and of affording adequate means of subsistence for the influx of new settlers.

That the transport of emigrants on ship-board, and that the first reception of the healthy and the sick at their destinations, should be carefully regulated.

In part, these advantages are now offered by the British Government to their own emigrants. That very useful publication, the "Colonization Circular," issued early in every year by the Colonial Land and Emigration Commissioners, supplies intelligent persons with nearly all the information they can desire, relative to the condition of the various fields for enterprize which are open to them in our colonies, and the regulations enforced by the New Passenger Act\* should go far to protect the poorer emigrants against those horrors of over-crowding, ill-dieting, filthiness, neglect, and pestilence, on ship-board, which, four or five years since, rendered the 'tween-deck of an emigrant vessel, nearly at all times, as deadly a position as that of a disabled man-of-war reeling and shattering under the devastation of an enemy's raking fire.†

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ly to be disseminated through the districts to which intending emigrants belong; and steps taken to contract or to extend the supply of labour, according to circumstances."—*Illustrated London News*, January 21st, 1843.

\* 12 and 13 Vict. c. 33.

† Dr. Stratton, of Montreal, gives a melancholy picture of the causes which led to the development of fever among the emigrants to Canada in 1847. After describing the disgusting neglect of all cleanliness among many of the emigrants themselves, he adds,—“sometimes they would not allow the Captain or crew to come down among them, afraid of being forced to wash, and go on deck; in others, again, *they were smoked out*, and so forced to go on deck; and, however well intended this may have been, it cannot be forgotten that some, and perhaps many, may have been too weak either to move, or even to be moved. Considering all these things, instead of wondering that the mortality was so great, we may feel surprised that it was not greater.” Fearful, indeed, were the ravages of the typhus, malignant ‘ship fever,’ and dysentery, which attacked the Quebec emigrants during the season of 1847. In six months, the number of deaths on the passage, in vessels during detention in quarantine at Grosse Isle, and at the marine hospital, amounted to 9,634. Out of 476 passengers, who left Liverpool in the ship *Virginus*, for Grosse Isle, no less than 158 died on the passage of fever, and 186 were ill on landing.—Indeed, the disease rapidly gained ground in Quebec, and extended along the route to the upper province usually followed by emigrants. This calamitous train of events was certainly not aided by any remissness on the part of the Canadian authorities. Dr. Stratton informs us that the expense of the quarantine establishment, and of the emigrant hospital, in various parts of the province, in that year, amounted to upwards of £1,31,000 sterling, which was



Still, it is evident that the protecting power of Government is further required in taking the entire executive control of Emigration under their own administration,—by placing the whole management in the hands of their own Emigration Agents, or of other authorities still more largely empowered to regulate the victualling and arrangement of the emigrant ships, to limit the number of persons embarked in each vessel, and to extend a strict supervision to their crews, medical attendants, and other officers,\* and, above all, as far as possible, to

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more than one pound sterling for each emigrant who left Britain for Canada; besides the above outlay by Government, there were the expenses of private subscriptions for maintaining widows and orphans. Dr. Stratton suggested that, by an improved scale of diet, and by every ship carrying a Surgeon, nearly all the above sickness, mortality, and expense, might be avoided, and this at a cost which would be perhaps a tenth, or at most a fifth, of the expenditure caused by the emigrant sickness in 1847.

Without the date, the above record of calamity might well be imagined to belong to a period contemporary with that in which worthy John Coad described the misery endured on ship-board by himself and a party of other unfortunates, who were condemned by Judge Jefferies, at the Bloody Assizes, to be sold as slaves in Jamaica. He says—"The master of the ship shut 99 of us under deck in a very small room where we could not lay ourselves down without lying one upon another. The hatchway being guarded with a continual watch with blunderbusses and hangers, we were not suffered to go above deck for air or easement—by which means the ship was soon infected with grievous and contagious diseases, as the small pox, fever, calenture, and the plague, with frightful botches. Of each of these diseases several died, for we lost of our company 22 men, and of the sailors and free passengers I know not how many, besides the master's mate and Esquire Linch,"—"We had enough in the day to behold the miserable sight of botches, pox, others devoured with lice till they were almost at death's dore. In the night, fearful cries and groaning of sick and distracted persons, which could not rest, but lay tumbling over the rest, and distracting the whole company, which added much to our trouble."

\* It was recently observed in the *Edinburgh Review* (July 1851) that "a great change was produced in the health of emigrants by bargaining with the medical superintendents of the vessels for so much per head, not according to the number embarked, but the number landed. It has been said," continues the reviewer, "that the health and vitality of the exiles which followed this arrangement represented merely the mercenary motive. We hope, however, that it is not a refinement to think it partly owing to a more precise declaration, and a better adjustment of the obligations contracted for. In the one case, the surgeon might conceive his duty to be satisfied by attending to the passengers when they were ill, and prescribing medicines for them; in the other, the proviso which made it his interest, must also have shewn him it was his duty, to keep them alive, if possible, and, for this end, to keep them in health." It is unquestionable that many worthy and learned men have sailed in the medical charge of emigrants. Still, the credit of selecting persons well-fitted for the duty can scarcely be accorded to those who have hitherto provided "experienced surgeons" for emigrant vessels. In fatigue, anxiety, wear of mind, and disappointment, one fatal case falls more heavily upon the medical man than do twenty of favorable issue. The neglect or brutality of a few ill-educated and unprincipled individuals must not be allowed to stand to the discredit of an honorable class. Whenever Naval Surgeons, or gentlemen carefully chosen, examined,



divert the tide of emigration from those countries which may not appear to afford sufficient prospect of independent subsistence for the settlers. Facts are continually being brought to light, which prove that none of the by-gone evils of crimping, impressment, or man-stealing for the colonies, ever excelled in atrocity the villanies which are still daily practised by a certain proportion of the self-constituted emigration agents, who lurk for prey at several of our chief ports. The present, it is true, is a time at which the rage—or, more probably, the necessity—for emigration appears to have reached its climax; still, it is most disheartening to find that, almost up to the present moment, the public press teems with examples of crowds of emigrants turned adrift to perish from removable causes of disease in the hospitals and sheds of the over-stocked countries to which their ill-directed and delusive hopes have unhappily led them.\*

The mere fact, that there are so many unoccupied and available acres of land in this colony or in that, has been a too prevalent incitement to injudicious emigration. However ample the field may be, destructive crowding must occur, unless the in-comers of one year be allowed to settle down before the admission of the immigrants of the next. It is a

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and organized for the duty shall be employed and liberally paid as the medical officers of emigrant ships, it is to be trusted that the present system of "no cure, no pay" will be discontinued, in consideration for the character and feelings of a class of men, whom their worst foes cannot presume to charge with callousness or inhumanity.

\* "There is another mournful feature of New York before breakfast, which will arrest the attention of the early riser. We mean the groups of houseless emigrants, male and female, in the park. The steps of the City Hill are dotted with them. Some are seated on the chains, others squatted around the doors of the emigrant and alms-house commissioners' offices, and, in fact, there are few coigns of vantage which do not present their groups. The women—many of them with babes at their backs—in all their varieties of attitudes, have only one expression—that of hopelessness; and an artist in search of a model for a figure of Despair would find no difficulty in selecting one from among them. The men wander listlessly about, with their eyes fixed upon the ground, as if looking for some convenient place to lie down and die. We saw more than a hundred of these poor creatures, a little after day-light one morning last week, gathered about the public offices, waiting until the dispensers of the city's charity should come to business. There certainly must be ways, in a country like this, of so employing these people as to render their labour a source of self-subsistence. Would it not be worth while to offer a prize for the best practical suggestion upon the subject?"—*New York Sunday Times*.

It is stated that in May 1851, 477 vessels arrived in New York with an aggregate of 38,346 emigrants. Of these vessels, 79 were under the British flag.

Recently, it has been reported that some important regulations have been instituted at New York for the protection of emigrants on their arrival thither.



hard thing to die of want, or to fall by the pestilence at home: but it is, indeed, far harder to undertake bitter sacrifices, and to pass through toils and dangers, merely to achieve the same calamitous fate. For too many of those who leave the British Isles, full of expectations of winning independence in wider and more hospitable lands, there still wails forth the prophecy, "Weep ye not for the Dead, neither bemoan him: but weep sore for him that goeth away—for he shall return no more, nor see his native country: but he shall die in the place whither they have led him—and shall see his land no more!" The fate of the emigrant should everywhere be under the protection of a wise and upright Government; and we may trust that the more extended working of the present system will, in a few years, dissipate those influences which now substitute death from preventible causes abroad for the increased mortality which might be anticipated from over-population at home.\*

The present is, assuredly, not a time at which success can be anticipated from new agricultural experiments of a very extended kind in the United Kingdom; still, it is singular that the admirable, and now long-tried, working of the pauper Colonies, Fredericksoord and Willemsoord, in the Netherlands, has not proved an inducement to the extensive introduction of a similar system at home and abroad. These colonies were established nearly 26 years ago, during a period of great scarcity. A "Society of Beneficence" was formed with a view to employing a number of destitute men in

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\* In August 1851, it was announced that the chief Commissioners of Emigration and the Secretary to the Board "were about to proceed on an official tour, in the course of which they would visit the several out-ports, with a view of ascertaining how far it may be practicable to carry out the recommendations of Mr. Sidney Herbert's Committee, and to remedy prevailing abuses in the American emigration trade. For this purpose, their attention would be specially directed to Liverpool, where it was expected regulations of a salutary character would be established, with a view to the protection of emigrants from fraud, and to their domestic comfort in 'Homes' or lodging-houses." In that year, an "Emigrant's Home" was opened in Liverpool: not without riotous demonstrations on the part of some ill-disposed persons, supposed to be in the pay of the emigration agents. It was, however, mentioned that, at about the same time, nearly 4,000 persons, 25 per cent of whom were described as paupers and beggars, had arrived in Liverpool from Ireland, in the course of a single week.

The revelations made by Mr. Vere Foster, with regard to the ill-treatment and deficient victualling of emigrants on board the *Washington*, an American ship bound for New York from Liverpool, have recently excited great attention. Mr. Foster embarked in this ship for the express purpose of ascertaining, from his own practical experience, the manner in which emigrants are treated. His evidence has been published in a return to the House of Commons ordered in February, 1851.



converting to arable land a waste, on which even a sprig of heather was scarcely to be met with. This spot is now described as a little oasis which displays every mark of prosperity, in its neat cottages, its luxuriant crops, and its gardens rich with flowers and vegetables. The quantity of land attached to each house is about seven acres imperial. The colonists are all supplied with implements on entering on the plat, besides a cow and a pig. The food of the colonists is, for the most part, potatoes and ryebread with milk, little or no flesh being used. The small farmers pay £3. 15s. a year for their plat: but the whole produce of the colonists' land is taken into the General Magazine. There is a regular creditor and debtor account kept with them from their first entering the colony. Every thing they receive is marked down against them, and whenever they are able to pay off their debts by economy of living, they are allowed to rent their plats. Some have succeeded in this, but the instances are rare. The scheme is not to be looked upon in the light of a speculation, for such it was never intended; but it has sufficiently succeeded in the object for which it was designed, namely, the relieving of the destitute, besides the evident social advantages consequent upon the system. Attached to the colony are schools for the gratuitous education of the children, and also work-shops in which they are taught weaving, shoe-making, and other useful trades. There are also colonies of a penal character, to which unruly members are sent, and which are subjected to more rigorous laws than are necessary in the free colonies.\* Unfortunately, however, the author of the *Latter-Day pamphlets*, one of the most honestly intentioned, but least practical, of our social regenerators, is nearly the only remaining advocate of systems akin to this, for improving the condition of the poor in the United Kingdom.† When the organization of labour plan, freed from

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\* From "Sketches of Belgian, German, and Dutch Husbandry," in the *Quarterly Journ. of Agriculture* for 1846; quoted in *Chambers' Journal*. An interesting account of a visit to Fredericsoord has since appeared in the last-mentioned serial (March 15th, 1851). The Society now employs 2,600 colonists upon 1,300 acres of reclaimed land. The Society is not yet self-supporting; it depends upon an annual grant from Government; but, as the traveller justly remarks, considering that the mendicancy of the country is kept at honest work in the Strof colonies, it is but fair that the state should bear a portion of the charge of maintenance.

† This writer, addressing a concourse of the destitute—as a ruler about to despatch them to the new scene of their toils and rewards—exclaims, "My indigent, misguided friends, I should think some work might be discoverable for you. Enlist, stand drill, become from a nomadic banditti of idleness, soldiers of industry! I will lead you to the Irish bogs, to the vacant deso-



some of the unfair prejudices, which at present hold it back, shall have been judiciously adapted to the wants of the people, with a due regard to their habits and opinions, a system not very dissimilar to that described above, (although very unlike that shadowed forth by Carlyle) would, in all likelihood, answer admirably, not only at home, but in many of the colonies, either under the administration of Government, or subject to the control of benevolent capitalists. The number of destitute poor who *will* not work is certainly smaller than is generally believed; at all events, there are, in every civilized society, thousands of half-starved creatures, who would rejoicingly undertake to win subsistence by energetic toil, without requiring to be stimulated by that dread of the whipping-post and the fusillade, which the author of the *Latter-Day Pamphlets* would hold constantly before their gaze.

## II. *The Embankment of Rivers, and the Draining and Cultivation of Marsh Lands.*

Little needs be said with regard to systems, the absolute necessity for which has been practically recognised and acted upon by every civilised people, from the earliest period of their emergence from a state of barbarism. It is not necessary that we should pause to enquire whether the immediate prompting of those who have instituted the generality of such improvements has been the greed of gain, or solicitude for the public health:—whatever the motive, the result has been equally fortunate. Intermittent Fevers and their allied disorders,—the natural scourges of all unre-

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lations of Connaught, now falling into cannibalism; to mis-titled Connaught, to ditto Munster, Leinster, Ulster, I will lead you: to the English fox-covers, furze-grown commons, New Forests, Salisbury Plains: likewise to the Scotch hill-sides and bare rushy slopes, which as yet feed only sheep; moist uplands, thousands of square miles in extent, which are destined yet to grow green crops, and fresh butter, and milk, and beef, without limit (wherein "no foreigner can compete with us"); were the Glasgow sewers once opened on them, and you with your colonels carried thither. In the three kingdoms, or in the forty colonies, depend upon it, you shall be led to your work! To each of you I will then say, here is work for you; strike into it with manlike, soldierlike obedience and heartiness, according to the methods here prescribed—wages follow for you without difficulty; all manner of just remuneration, and, at length, emancipation itself follows. Refuse to strike into it, shirk the heavy labour, disobey the rules—I will admonish and endeavour to incite you; if in vain—I will flog you; if still in vain—I will at last shoot you, and make God's earth, and the forlorn-hope in God's battle, free of you. Understand it I advise you." (*"Latter-Day Pamphlets"*—*The present Time*:—p. 54.)



claimed and uncultivated countries,—have vanished everywhere before the advance of agricultural improvement.\*

Up to a comparatively recent period, Malarious Disease was, if not the severest, certainly the most persistent of the causes of death in England. The household books of our early kings and nobles are full of records of charges for ague-medicines and anti-dysenteries, and the histories of these exalted personages shew that few, if any of them, found the narrow, tapestried chambers of their ill-ventilated and comfortless dwellings, proof against visitations of the deadly marish vapours which rendered their boasted defences of encircling moats and swamps more insidiously offensive to life, in

All the infections that the Sun sucks up  
From bogs, fens, flats,—

than any open force with which the violence of their foes could assail them. London was, and indeed is, still very unfortunately situated in this respect. An examination of the various extant maps of our ancient Metropolis and its environs, will leave little doubt that the tract now occupied by the southern suburbs was formerly almost entirely covered with water; and that even in comparatively recent times, the environs of the City were absolute marshes. In the reign of Elizabeth several of the suburbs were still unreclaimed; their original states are shewn by several names still extant, as *Fensbury Fenchurch*, and *Fennie-about-Ward*, *Moorfields*, &c. On the south side of the Thames, a marsh extended from Lambeth to Southwark; and at no very distant period, this tract was intersected with ditches; its name is still preserved in the crowded district of "Lambeth Marsh." Southwark itself was more elevated; but,

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\* The following sensible remarks upon this subject are from Chambers' *Information for the People*—Article 'Popular Statistics.' "The efforts which have been made to render land which was not productive, or productive of little, more fertile, have indirectly contributed to promote the public health. The draining of the fen countries on the east coast of England has banished a class of diseases which were most destructive in these districts. The fevers of Essex used to be inferior in virulence, but scarcely inferior in frequency, to those of the Pontine Marshes. With the drainage of the Marshes of that country, these fevers have disappeared. 'The intermittents,' says Mr. Rickman, 'which heretofore, under the name of ague, infested the country very extensively (especially the fen districts), are no longer spoken of.' (Scarcely this.) 'In the time of Richardson the novelist, as we learn from his published correspondence, the scourge visited periodically even those families who were in easy circumstances. The change for the better is, of course, most manifest in the most unhealthy districts, but it is experienced in the diminution of chronic rheumatism, wherever surface and under-ground drainage have extended.'"



towards Bermondsey, the ground became low; and even now, this suburb is partially drained by open ditches. Pimlico and a large portion of Westminster stand on reclaimed ground. On the East and South, the suburbs of London are bounded by marshes in which the work of improvement has still to be undertaken. We know that, in the time of Sydenham, Intermittent Fever destroyed from one to two thousand persons in London every year:\* the ordinary form of this malady has nearly disappeared as the process of draining has advanced. Still, the types of various diseases affecting the inhabitants of the town and its environs prove that the remains of Marsh Malaria yet exist in London.†

Unhappily, agricultural enterprize is nearly at a standstill among the masters of the English soil. Still, it is cheering to observe the progress of such undertakings as the drainage of Whittlesea Mere, in Huntingdonshire, once the most spacious fresh-water lake in the southern parts of Great Britain; the works for reclaiming a large portion of the Wash of Lincoln, now proceeding under the auspices of the Norfolk Estuary Company:‡ as well as the, perhaps still more important, undertakings of the Irish Waste Land Improvement Society, established in 1836, and of the Irish Amelioration Society, whose operations

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"A remarkable instance of the effect of marshes upon health is cited by M. Villermé. Formerly, the district of Vareggio, in Tuscany, was in this condition; and its few miserable inhabitants were every year visited by severe agues. In 1741, flood-gates were erected to keep out the sea, the marsh was dried up, and ague appeared no more. Vareggio subsequently became a populous and healthy district. The Isle of Ely is a marshy district in the east of England, and it was ascertained that of 10,000 deaths, which occurred in it between the years 1813 and 1830, no fewer than 4,732 were of children under ten years of age; the proportion of deaths of children under ten in all the other agricultural districts of England being only 3,505, or as about 3 to 4 of the former number. Of 10,000 deaths between ten years and extreme old age in the same period, there were, of persons between ten and forty, 3,712 in the Isle of Ely, and only 3,142 in drier districts."

\* Mr. R. Martin cites a statement by Dr. Caius to the effect that, "the mortality from ague in London, in 1588, was such that the living could hardly bury the dead." There must however be an error in this date, as Caius died in 1573.

† See Mr. Hicks' remarks on Malaria as existing on the Surrey side of the Thames.—*Lond. Med. Gazette*: January 15th, 1847.

‡ It is probable that these works were suggested by the still greater enterprize of draining the Harlemmer Meer, which must now be nearly completed. It appears that the Dutch propose no less a task than that of reclaiming the land which is now washed by the Zuyder Zee,—(a tract about 80 miles in length, and from 20 to 40 wide)—by constructing a dike with buttresses and flood-gates across the narrowest part of the Zee, from Medenblik or Enkhuizen, on the insulated portion of N. Holland, to Stavoren in Friesland. This, however, scarcely comes within the scope of sanitary improvement.



were commenced about eight years since, at the Bog of Allen, near Robertstown in Kildare, under the direction of Mr. Rogers, C. E. This latter Society acts under the provision of a charter for "the conversion of peat-fuel into charcoal for sanitary and other purposes, as also for the reclamation of the bogs of Ireland." It appears that, hitherto, the working of this plan has been such as to afford reasonable promise of the three great desiderata in the object of reclaiming marsh lands,—the improvement of the sanitary condition of the districts, the employment of large numbers of the neighbouring poor, and the acquisition of reasonable pecuniary profits. Of late years, it has been clearly proved that very much has yet to be achieved in reclaiming our British wastes. It is shewn that, out of the seventy-eight millions of acres, which constitute the surface of Great Britain and Ireland, there are about twenty-six millions of acres under cultivation,—a great proportion of which land is far from having attained the maximum of modern culture; twenty-one millions in pastures, capable of being either cultivated or greatly improved as pasturage; fifteen millions of wilds declared capable of improvement according to the general understanding upon this head; and the remainder, amounting to fifteen or seventeen millions, considered as "incapable of improvement," though, in reality, susceptible of profitable amelioration. Thus, it may be safely asserted that less than one-third of the entire country is under proper cultivation; and that the remaining two-thirds form a mine of incalculable wealth, if the means suggested by modern science for its attainment were only adopted.\*

The day must be far distant, but it will probably arrive, in which the working out of this beneficial change will become one of the most potent means of enhancing life among the inhabitants of Great Britain and Ireland.

III. *The Infliction of Heavy Penalties upon all Persons found guilty of Adulterating any Medicinal Drug, or any Article of Sustenance, or of vending the Flesh or Milk of Ill-Fed or Diseased Animals.*

We should, doubtless, be considered far behind the humane and enlightened spirit of the age, did we venture to argue in favor of Thomaso Anello's justice and practical common sense in consigning a fraudulent baker to his own oven; or if we attempted to enlarge upon the wisdom of the Turkish

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\* *Chambers' Journal*: vol. I. New Series.



Government, in summarily nailing the ears of those found guilty of like villanies to their shop door-posts, as warnings to similar miscreants. Still, it is difficult to conceive another atrocity at once so cowardly and so inhuman as that species of fraud which, for the sake of gain, adulterates the only articles of food whence thousands of sickly infants derive a bare subsistence; abstracts the nutriment of the scanty and hardly obtained meats upon which the extremely poor maintain a protracted starvation; and deteriorates those medicines which Divine Providence has mercifully granted to man for his relief in the hour of his mortal anguish.

In 1848, a law was introduced, imposing heavy fines upon those found guilty of importing diseased cattle, and of exposing for sale diseased or otherwise unwholesome meat.\* Still, a vast amount of unpunished and almost unrecognised fraud attends the manufacture and sale of nearly every description of food for human consumption, within the British Dominions. When the *Lancet's* "Analytical Commission," a short time since, obtained specimens of Coffee from most of the London dealers, only 5 samples in 56 were discovered to be free from adulteration. In like manner, of 35 samples of black tea, as imported, 12 were adulterated; of 24 samples purchased of tea-dealers, 4 were adulterated; of 30 specimens of green tea, as imported from China, all were adulterated,—two specimens of Assam tea were genuine; out of 26 samples of Milk, 11 were adulterated, and out of 36 samples of arrow-root, 18 were either adulterated or spurious. This is, doubtless, merely the opening of a series of dis-

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\* The object of this Act was to prevent the importation of diseased sheep and other cattle, and also to prevent, until the 1st September, 1850, the spreading of contagious or infectious disorders among sheep, cattle, and other animals. By this statute, infected sheep exposed for sale might be seized and destroyed, together with pens, hurdles, &c. Power was given to impose a fine, not exceeding £20, on parties exposing cattle, knowing them to be diseased; a like penalty on persons exposing meat unfit for human food, with power to seize and destroy the same. The P. Council were empowered to make regulations as to the removal of sheep, &c., and as to the purifying of yards, stables, &c.

The following useful Hygienic provision is introduced into the 11th and 12th Victoria; chap. 107. section 3. "And whereas it is expedient to make more effectual provisions for preventing the exposure for sale of any meat unfit for human food; be it enacted, that if any meat unfit for human food be exposed or offered for sale in any market, fair, or other open or public place, it shall be lawful for such clerks, inspectors, constables, policemen, or other persons, authorized as aforesaid, to seize the same, and to report such seizure to such mayor or justice as aforesaid, and such mayor or justice may either order the same to be destroyed or otherwise disposed of, as aforesaid: and any person publicly exposing or offering such meat for sale shall, upon conviction, forfeit and pay for each and every offence a sum not exceeding £20.



closures tending to exhibit the fact that, although unwillingly, the epicures of London feed scarcely less impurely than do the jackals and vultures of our Indian Maidauns.

What expectation of health and life can be looked for among a people whose bread is whitened and rendered weighty by Alum, Plaster of Paris, and Bone-Dust, and is, moreover, frequently so ropy or ill-fermented as to be absolutely unfit for human consumption?—whose supply of milk, to say nothing of its watery dilution, is liable to be thickened and frothed with flour, starch, anatto, sugar of lead, the brains of sheep, dogs, cows, and horses, and the lungs of calves?—[The two last-mentioned devices were originally Parisian improvements; but they long ago found liberal adoption among the benevolent herdsmen of our Metropolis. The report of the “Analytical Sanitary Commission” shews that, towards the end of 1851, the only adulteration discoverable in London Milk was its more or less dilution with water. It is probable, however, that the publication of Mr. Rugg’s “Observations on London Milk” had already placed a check upon the grosser modes of deteriorating this article of diet.]—whose tea, when it does, in reality, chance to be the genuine

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\* It was stated, some years since, that upwards of 1,00,000 sour quartern loaves were sold daily in London and its environs. Ill-fermented bread is one of the most prevailing causes and aggravations of dyspeptic complaints and of calculous disease. It has been recommended to prevent this condition by adding a small quantity of carbonate of Soda or Magnesia in the baking; but the plan of making unfermented bread, which was introduced a few years ago, is the most certain means of preventing vegetable acidity. The author of a recent work on this subject [Instructions for making Unfermented Bread, by a Physician. London, 1846], recommends the following formula;—Wheat-meal, 3 pounds avoirdupois; bicarbonate of Soda, in powder,  $4\frac{1}{2}$  drachms troy; hydrochloric acid, 5 fluid drachms and 25 minims or drops; water, 30 fluid ounces; and salt,  $\frac{3}{4}$  of an ounce troy. “Bread made in this manner,” says the author, “contains nothing but flour, common salt, and water. It has an agreeable, natural taste, keeps much longer than common bread, is more digestible, and much less disposed to turn acid.”

I can speak from experience of the perfect wholesomeness of bread made nearly upon this plan. When first eaten, it appears somewhat heavy, but this is not, in reality, the case; it is not doughy, but merely denser than common bread; it is certainly not quite so agreeable to the palate as ordinary baker’s bread, but the taste is soon acquired. In India, where sour bread is served up at every English table during the rains, owing to the acetous fermentation of the *taree*, the introduction of unfermented bread would be a real blessing. It is certain that many an attack of Cholera and severe indigestion would be in this way prevented. At present, it is almost impossible to give bread to children and invalids in Bengal during several months of the year.

It must not, however, be overlooked that Liebig recommends yeast in preference to muriatic Acid and carbonate of Soda (Familiar Letters on Chemistry, lxxix). The wholesomeness of really well-fermented bread is unquestionable:—the difficulty is to obtain the food thus successfully prepared.



produce of the tea plant, and does not present the botanical characters of the Plane, Box, Elm, Apple, Willow, Rose, Poplar, or highly-flavored Sloe,—has received a “glazing” of Black Lead, or owes its bloom to Prussian Blue, Turmeric, China-clay, Sulphate of Iron, Rose Pink, or Indigo, if not to Verdigris, Arsenite of Copper, or the Chromates of Potash and Lead?—whose generous wine, when it actually reaches their lips as true Alto Douro, Port, Champagne, or Marsala—and not as a composition of strong cider, brandy, log-wood, and bay leaves; or of rhubarb-stalks, spring nettle-tops, eggs, and sugar, (if that may be termed sugar which is generally composed of “blood, albumen, fragments of the sugar-cane, starch granules, lime, lead, iron, and grit or sand,” with a certain amount of saccharine admixture,)—is made sweet and strong-bodied with elder berries, “sugar,” as aforesaid, and aqua vitæ, and is cleared and de-acidulated with genuine white-lead—their “limed sack” being, of course, handed down to them from age to age as a kind of hereditary loving-cup?—whose Porter owes its headiness and heaviness to *Cocculus Indicus* and Liquorice; has undergone “bobbing” with Salt and Water; and receives its grateful frothing from a copperas admixture?—whose Gin—a strong poison in itself—derives its aroma and astringency from Turpentine and White Vitriol?—whose palates are tickled, in childhood, with comfits, the substantial portion of which is Sulphate of Lime, Red Lead, Mineral Green or Verdigris, and Bitter Almonds; and whose last gasp is devoted to the imbibition of a so-called medicine which, to say the least, has one half of its bulk made up of some utterly inert material? In a nation thus dieted and drugged, what can be anticipated but the prevalence of chronic disease, and of early death?

The results of the investigations of the “Analytical” (or Microscopical) “Sanitary Commission” already referred to,—whose revelations have been appearing in the *Lancet* since January, 1851—have placed in the strongest light the absolute necessity for a Government establishment of scientific men, whose duty it would be to subject to microscopical and chemical examination, samples of every description of article of food on sale in the markets and wholesale and retail shops of the Metropolis. In course of time, similar Commissions might be advantageously established in most of the larger provincial towns. It has been very judiciously suggested that the present “Commission” should be rendered permanent, and endowed with the powers of a public prosecutor. The moral pillorying of a few scores of fraudulent



tradesmen, their imprisonment, the forfeiture of their licenses, and the ignominious publication of their names in Government advertisements, would prove a boon to the entire population of our great cities, by no means second in value to that afforded by the advantages of Free Trade. Some of the speeches which were reported a year since in the public prints,—as having been delivered by certain of the shop-keepers who attended the meetings convened in London, soon after the appearance of the Analytical Commission's earlier revelations,—are alone sufficient to prove that there exists among our traders a class of men who, without having the excuse of grinding poverty or deficient education, are—we will not say *dishonest*—but absolutely incapable of pretending to, or even of comprehending, the bare form and style of honorable dealing. The mere existence of an active and vigilant scientific Commission of the kind alluded to would exercise the same terrifying and restrictive effect upon these vermin, that the vicinity of terriers and ichneumons has over rats and snakes,—“It will never be merry in England, till we have the skins of such.”

With regard to Drugs,—the duty of ascertaining the condition of Medicines vended in the Metropolitan warehouses and retail shops, lies between the College of Physicians and the Society of Apothecaries. How far the necessary surveillance is actually maintained, must be decided rather in the consciences of those respectable bodies than by any information vouchsafed to the public or to the Profession on this subject.\* We long ago suggested† that it would be to the credit of the wholesale druggists throughout Europe, did they enter into combination, with a view to detect and punish the destructive frauds of those who gain a detestable profit by the adulteration of medicinal agents; but we then apprehended, as we still believe, that neither the exertions of individual members of the Profession, nor the imperfect supervision of our corporate bodies, will ever become the means of wholly putting down this ancient and flagrant atrocity;—the establishment of stringent legislative measures can alone be equal to the task; and it is to be trusted that many more sessions will not be allowed to elapse, before the condition of all drugs imported into and sold in the country and the colonies is made

\* It was recently stated, in the *Boston Medical and Surgical Journal*, that Dr. M. J. Bailey, the first Examiner of Drugs for the port of New York, rejected 90,000 pounds of various base drugs, during nine months prior to his removal from office.

† *Lond. Med. Gazette* : Nov. 12, 1847.



a matter of the strictest investigation. Dr. Lewis Beck has opened this enquiry, in a useful popular treatise;\* but the honor of making the first practical onset in this righteous war lies open to the "Analytical Commission."

There are two most serious drawbacks which attend the poor of our large cities in the purchase of their food. First,—nearly every article provided for their consumption—apart from adulteration—is of the worst quality procurable.† Secondly,—the price of nearly every article is increased in an inverse ratio to the quantity bought;—thus, even when false weights are rigorously eschewed, he must be a fortunate purchaser indeed who succeeds in obtaining one-twelfth of an ordinary shilling's worth for his penny. These are, doubtless, all matters in which the Legislature will hereafter judge between the poor and their real oppressors.

#### IV. *Restriction in the Sale of Ardent Spirits, and of other Intoxicating Drinks.*

From the earliest periods of history, Drunkenness has been the characteristic vice of the northern races. The first apostle of temperance arose among the Saxons in the person of St. Dunstan, but the weak device of pegging the was-sail bowl is the only recorded vestige of his restrictive measures.‡ The power of wine appears to have exerted no small influence in the overthrow of the Anglo-Saxon race:—the courtiers reeling in panic-stricken crowds towards Hardicanute's dais at Lambeth—

"Whilst Apoplexy cramm'd Intemperance knocks  
Down to the ground at once, as butcher felleth ox."—

Goodwin carried away paralysed from the Confessor's feast,—and Harold closing Saxon England's last revel, in the wine month§ among the trampled vines of Senlac,—all afforded

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\* *Adulterations of Various Substances used in Medicine and the Arts; with the means of detecting them:* intended as a manual for the Physician, the Apothecary, and the Artisan. New York. 1846.

† There are many large districts of London in which the butchers confess that, owing to the absence of wealthy customers, they are unable to keep meat of the best quality. Nearly all other viands and goods sold in those quarters are of the coarsest and most inferior description.

‡ And even the honor of introducing this sanitary check is claimed for another. "King Edgar, like a king of good fellows,"—says Selden—"or a master of the revels, made a law for drinking. He gave orders that studs or knobs of silver or gold (so Malmesbury tells us) should be fastened to the sides of their cups or drinking-vessels, that when every one should know his mark or boundary, he should, out of modesty, not either himself covet or force another to desire more than his stint."

§ October—the Wyn-monat of the Anglo-Saxons.



vivid signs of the fact that England once fell in its strength by disregarding those laws by which Sparta rose. Mead, Methleghin, and oaten and barley ale, embittered with broom, wormwood, bay-berries and ivy-berries, served to muddle the brains of our commonalty from the times of Hengist and Horsa until the reign of the "bluff king,"\* when the introduction of hops† gave origin to that "Beer" which Raleigh, in his last moments, declared, with triple meaning, to be "a good drink if a man could only stand by it." The Conquest brought French wines into England, and temperance must have been rare in a country where the nobles purchased the ruddy juice of Bordeaux by the hundred pipes,‡ and every knave might quaff half a gallon for a groat.§ According to Camden and Sir John Smythe, the English vice of Spirit-Drinking

\* The extent to which these kinds of ale were drunk at a very early period, may be judged of by a record of the expenditure of the great Abbey of St. Edmondsbury, in the 14th year of Edward I., still extant among the Harleian MSS. This contains an account of the necessities required to support 80 monks, 111 serving-men, 11 chaplains, the nuns of Stretford, and visitors. (To the credit of this holy community, it must be remembered that the number of those 'visitors,' including the poor, was almost infinite.) Every week the brewery received 12½ seams (quarters) of barley malt at 4s. the seam, and 32 seams of oaten malt, at 3s. the seam. The charges for the Abbot's brewery, which was a separate establishment, scarcely fell short of the above.

† Hops were introduced into England in 1524. The parliament of 1528 petitioned against hops, as "a wicked weed." "Beer," says Yarrell, "was licensed for exportation by Henry VII., in 1492; and an excise on Beer existed as early as 1284. Also in the reign of Edward I." It is therefore evident that the wormwood ale of olden times was by no means so contemptible a beverage as that "poor creature small beer;" and that full opportunities for intoxication were open to the commons of England from nearly the earliest periods.

‡ We learn from the household expenses of the Earl of Lancaster, in 1313, that the quantity of French wine consumed in his magnificent household, in one year, was 371 pipes, at 17s. a pipe, which is estimated as equivalent to about £4. 15s. of our money. At any rate, however, this must have been mere vin ordinaire. The records of Coningsborough shew that, in 1321, (14th Edward II.) 4 gallons of wine cost two shillings; 12 gallons of (barley ?) ale 1s. 6d. and 16 gallons of (oaten) ale 16 pence.

§ Lydgate, in his London Lyckpenny (cir. 1430) describes an unfortunate who, being unable to dine on beef or hot sheeps' feet for a penny, expended that sum in despair on a pint of wine, and gat him gone fasting:—

"The taverner took me by the sleeve,  
'Sir,' saith he, 'will you our wine assay?'  
I answered. 'That can not much me grieve,  
'A penny can do no more than it may';  
I drank a pint, and for it did pay,  
And sore a-hungred from thence I yede,  
And wanting money, I could not speed."

In 1578, red and white claret were sold for 5 pence the quart, sack for 6 pence, and muscadell and malmsey for 8 pence.



was acquired among the fogs of the Netherlands, by the troops under Leicester and Sydney. From this time forward, it would be difficult to decide in which succeeding reign the grossness of intoxication was displayed most revoltingly:—whether in King James' orgies at Theobald's; in the untimely revels of Goring; in the second Charles' maudlings at Cranbourne; in the secret, "respectable," thorough-going, intemperance of Queen Anne's time; in the mad quaffing of smuggled spirits which came into vogue as a practical defiance to Walpole's salutary attempts to reform the excise in the confirmed practice of dram-drinking and wine-soaking, which disgraced society throughout the reign of George the Third; or in the modern moral pestilence of the London Gin-Palaces. Fortunately for humanity, the present century may lay claim to the honorable distinction of having introduced, in the *Temperance Movement*, a moral reform greater and better than that which was wrought by the Crusades, and second only in importance to that which developed the Reformation. This system, like every other system of human devising, has its imperfections and its short-comings, and its results cannot be viewed without a certain feeling of disappointment; but it must indeed be a narrow spirit of Christianity which will refuse to afford to the name of Matthew a place in history, not far removed from those of Wickliffe, Luther, and Melancthon. The more recent statistics of intemperance go far to shew that the spirit of moderation is gradually advancing in all classes throughout civilized Europe. In good society, the "three-bottle-man" is now an extinct animal;—and we may presume that it would be difficult to meet with an English *gentleman*, either at home or in the colonies, who could accuse himself of ever having wilfully become intoxicated. The maxim of Sir William Temple—"one glass for health, a second for refreshment, a third for a friend, but he that offers a fourth is an enemy"—now appears to have become a tacitly acknowledged rule in all respectable companies:—still, Drunkenness, gross, flagrant, and habitual, prevails as the great and leading moral and physical pest among the operative and indigent classes of our large cities. Crime and Death, in every form and degree of turpitude and hideousness, daily burst from the jaws of this mighty demon—"noctes atque dies patet atri janua Ditis." The open Gin-shop discharges nine-tenths of that once active life which wastes and corrodes in the cells of our over-grown prisons, and perishes in the wards of the great hospitals. It appears that no attempt has ever been made to demonstrate statisti-



cally the precise amount of mortality which occurs annually in our principal cities, directly and indirectly, as the result of intemperance in the use of beer and spirituous liquors.\*

\* Dr. Carpenter has adduced some useful general statistical data illustrative of the comparative effects of temperance and inebriety on health in his Prize Essay "On the Use and Abuse of Alcoholic Liquors in Health and Disease." He refers to the fact, that the rate of mortality among persons whose lives are insured is considerably less than in general society, and he attributes this circumstance mainly to the fact that policies are granted to none but temperate persons. This however is, probably, merely a part explanation of the matter. Dr. Carpenter shews that at the age of 40 years, the annual rate of mortality, among the whole population of England, is about 13 per 1,000; whilst amongst the lives assured in life offices, it is about 11 per 1,000; and in those insured in friendly Societies, it is about 10 per 1,000. Now, the average mortality for *all ages* between 15 and 70 years is about 20 per 1,000; whereas, in the Temperance Provident Institution, after an experience of eight years, and with several lives above 70 years of age, the average mortality has been only 6 per 1,000, up to the present season (1849!) "in which it has undergone a slight increase from the Cholera Epidemic. It is worthy of remark, however, that although many of the insurers in this office are of the poorer class, whose conditions and employments expose them much more than the middling classes, generally, to the endemic causes of cholera, no more than 8 have died of this disease out of the total of about 3,500 insurers. As a means of further comparison, the following table may be subjoined, in which the mortality of the insurers in the Temperance Provident Institution, for the first five years, is compared with that of the insurers in offices during the corresponding period of their existence.

A.	issued	944 policies and had 14 deaths, being equal to 15 per 1000.
B.	"	1,901 " 27 " 14 "
C.	"	838 " 11 " 13 "
D.	"	2,470 " 65 " 26 "
T. P. I.	"	1,596 " 12 " 7½ "

During the sixth year of its existence, only 2 deaths occurred out of the whole number of insurers in the Temperance P. Institution, by which its annual average mortality was reduced still further."

Dr. Carpenter gives a striking illustration of the effect of stimulants in pre-disposing the body to pestilential and endemic disease. When cholera visited Manchester, the nurses in the hospital were allowed to go home after working six hours. They took the disease, and died of it in such numbers, that fears were entertained of the failure of the supply. It was found that they were much given to alcoholic potations (with the idea, probably, of increasing their power of resisting the malady) during their leisure hours; and they were therefore confined to the hospital and debarred from obtaining more than a small supply of alcoholic drink; *after which, not a single fresh case occurred amongst them.* In Chambers' notice of this work, it is added that, at the visitation of the cholera to London in 1849, it was found, in the establishments where numbers of men were employed, that the victims were chiefly the men addicted to drink.

With regard to the effects of Intemperance in producing Insanity, Dr. Carpenter shews that in returns from 98 Lunatic asylums in England and Wales, it was found that, out of 12,007 cases, no fewer than 1,799, or nearly 15 per cent., were set down to the score of intemperance; besides 551 more attributed to vice and sensuality, 'in which excessive use of alcoholic liquors must have shared.' In pauper lunatic asylums the proportion of those who have become insane from intemperance is usually much larger than it is in asylums for the reception of lunatics from the higher classes, among whom



We can only state from thirteen years' acquaintance with the London Hospitals that the Surgeons and Physicians of those institutions are very rarely able to divest themselves of the opinion that the diseases of their adult patients are more or less attributable to the prevailing vice. Let any stranger traverse the wards of one of these great receptacles of suffering, and glancing at the pasty, bloated, forms of the dropsical wretches who lie panting there in every direction, to say nothing of the many victims of other more insidious diseases who meet his view, he will perceive at once that he stands within the slaughter-house of that mighty destroyer—Strong Drink. At this moment, there slink through the streets of London thousands of broad-shouldered and yet active men, still in the very prime of life whose habits will, with the certainty of an irresistible fate, bring them to their graves before the expiration of another lustre. Some comparatively trivial accident,—a few blows with the fist, a sudden drenching, a scalp-wound received in a drunken broil,—it may be even a cut finger, or the extraction of a tooth, or a scratch with a rusty nail,—will be followed by an outburst of disease, against which every remedial effort will prove absolutely futile. The slow poison, vice, exposure, hard toil, and many vicissitudes, have damaged the structure and embarrassed the actions of every vital organ; and as a spark flies onward upon a train, the slightest disturbing cause will overthrow the balance upon which their small remaining powers of reparation quiver, developing the erysipelas, the delirium tremens, or the inflammatory dropsy, which, in progress of time, spring from habits of intoxication as certainly as the barley-blade arises from the carefully sown barley-grain.\*

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intemperance is less frequent, while causes of a purely moral and intellectual nature operate upon them with greater intensity. One curious particular is worth notice,—that Dr. Hutchinson, of the Glasgow Asylum, found an increase in the proportion of lunacy from drinking during the years 1845 and 1846, in consequence, as he thought, of the excitement in which the community was kept by that universal spirit of gambling which seized on society like an epidemic mania; 'there being a great connection between general excitement and a craving for stimulants.'

\* Some years since, I made a careful examination of the records of Guy's Hospital, with a view to obtain a fuller insight into the causes which occasion death within a few hours or days subsequent to the receipt of injuries (not in themselves of a mortal character), or the performance of surgical operations. I found that within a period of 15 years, 153 of these cases had occurred in the hospital. In 134 of these, death had resulted from inflammation of internal organs or secreting surfaces (excluding the kidneys, liver, and spleen). In the remaining 19, the patients died from other causes, such as tetanus, sloughing, hæmorrhage, suppuration, gangrene, erysipelas, diarrhœa, and total defi-



It is not strange, however, that an evil so ancient and so deeply-rooted as this should defy the strongest and the most workman-like efforts to eradicate it. In all recent times, the legal suppression of intemperance has proved one of the knottiest problems with which well-intentioned ministers and philanthropic national regenerators have to contend. Repeatedly, within the last two hundred years, the attempt to lay on a crushing excise, with a view either to recruit an impoverished exchequer, or to place a check upon the growing evil of intemperance, has awakened a spirit of opposition and fury in the popular mind, which has imminently threatened the safety of the Government. The first experiment of this kind appears to have been the only forcible temperance movement that has ever been crowned with success. In 1574, the Lord Mayor, alarmed by the increase of London ale-houses, called in the aid of the authorities of Southwark and Lambeth, and suppressed about two hundred of these taverns within their jurisdictions. A similar clearance was made in Westminster, and in other places around the Metropolis. This, however, was little more than an exercise of local police authority—a mere blowing off the froth of the evil—at a time, too, when judicial absolutism was least disputed in England. Upon an attempt being made to introduce the Excise Duties, in 1626, the commission was thrown out of Parliament by an unanimous vote to the effect that the scheme was contrary to the English Constitution.\*

In 1641, the Parliament, although hardly pressed for means at an urgent crisis of their struggle with the King, stre-

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ciency of reparative action in the wound. In one only, the precise cause of death could not be discovered. Out of the total number of cures, there was marked disease of the spleen, liver, or kidneys, in 93 cases. In the 134 cases of death from internal inflammations, there was also superadded marked disease of the spleen, liver, or kidneys, or of all those organs combined, in 90. My attention was first drawn to this enquiry by observing that the morbid characters of the changes discovered in the bodies of those who died of acute internal inflammatory attacks, after external injuries, bore a strong resemblance to those which so characteristically distinguish the inflammatory affections of the same parts which are known to result from Bright's disease of the kidney,—an affection which, in a very large majority of cases, results from habitual intemperance.—(*An Enquiry into Certain of the Causes of Death after Injuries and Surgical Operations in London Hospitals. With a view to their Prevention.*—*Guy's Hospital Reports*: 1845.)

\* Prynne's "Declaration and Protestation against the Illegal and Detestable and Oft-Contemned New Tax and Extortion of Excise in general, and for Hops, a native and uncertain commodity, in particular." A conference with the Lords subsequently took place on the subject, in which Sir Edward Coke, on the part of the Commons, described the measure as "monstrum informe ingens"—descanting upon each of these strong terms; yet "blessed be God," he added,—"cui lumen ademptum,"—whose eyes were pulled out by



nuously disclaimed a report which appears to have arisen, to the effect that they were about to levy an excise,—declaring the rumour to be false and scandalous, and menacing its authors with condign punishment. A little later, however, the necessities of the Parliament rendered a resort to this obnoxious measure compulsory. The first fruits of the new tax was a riot in London, during which the populace,—well-affected towards the Parliament in the main, but, doubtless, leavened with a sprinkling of stanch loyalists,—rose in formidable numbers, and burned down the new Excise Office in Smithfield. This spirit of dissatisfaction spread throughout the country; and Fairfax's dragoons were scarcely equal to the task of quelling the "tumults, riots, and unlawful assemblies," which the detested impost evoked in every quarter. The excise duties on intoxicating drinks were lightened at the Restoration, but were gradually increased during the four succeeding reigns. In 1733, an admirable attempt was made by Walpole to remodel the entire system of excise, and to check the extraordinary amount of fraud and smuggling which then filled England with lawlessness and violence. The proposed measure gained a majority in the House; but the minister discovered, in the insane fury with which the public received it, that his system could not be introduced without endangering the safety of the country. He therefore wisely abandoned it. The news of this retraction was received throughout the kingdom in a spirit of frenzy, rather than of rejoicing. A similar trial attended the commencement of Washington's legislative career. Early in the last century, the vice of gin-drinking had risen to its highest pitch in London; the restraint upon distilleries was extremely slight; it was computed that there were not fewer than 20,000 spirit shops within the bills of mortality; and "blue ruin" was at its cheapest;—in the words of the popular announcement, any one might "get drunk for one penny, dead drunk for two pence, and have clean straw for nothing." This evil met with a too violent re-action;—an injudicious attempt was made to place a prohibitory tax of twenty shillings per gallon on Gin and other spirituous liquors, and to restrict the retailing of spirits to dealers who should pay fifty pounds per annum for their

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the Commons, which he hoped their Lordships would second before the monster was fully brought forth to consume and devour the nation. Eventually, the King cancelled the Commission; and, for a time, the matter was dropped.—*Mr. Platt,—in Knight's London.*



licenses. The Gin Act struggled feebly on for about six years, and then sunk, overborne by active opposition and irrepressible fraud. Within our own time, a somewhat similar measure has been similarly evaded.\*

It is evident, therefore, that neither the imposition of what Johnson—launching out in the spirit of Marvell (or rather of Thrall)—designated as “a hateful tax,” in effect prohibitory, upon the sale of intoxicating liquors; nor the employment of forcible coercive measures, can be regarded as the means by which the vice of intemperance can be checked, either in England or in any other country. Still, there are one or two legislative enactments which are obviously called for as restraints upon the excessive sale of intoxicating drinks in the United Kingdom; viz. 1st,—as a means of diminishing the number of spirit and beer shops,—the establishment of a very active surveillance upon all low public-houses and gin-palaces, and the determined withdrawal of licenses from those tavern keepers who should in any way lay themselves open to public censure, by the encouragement of gambling, riotous proceedings, or other offensive attendants or results of debauchery. This law would be merely an extension of the rules upon which magistrates are at present empowered to act; but the publican and the sinner should never be allowed to appear in one flesh; if licensed victuallers and barmen are indispensable evils, they should be rendered the most immaculate of social pests. 2nd,—the vigilant supervision of the *quality* of the liquors sold by all wholesale and retail Wine, Beer, and Spirit dealers. Let it once become the rule that none but genuine liquors should be vended throughout the country, and it would be found that the number of retail shops would become rapidly diminished, and that the ill effects of intemperance would be more than proportionately reduced among large classes of the popula-

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\* After the introduction of Sir Robert Peel's Irish Spirit Duties Bill, by which the duty was considerably raised, a decided stimulus was given to smuggling. From returns laid before Parliament, it appeared that the detections for the quarter ending 5th July, 1842, shewed the enormous increase of 847; while the gaol returns in 1841, shew only 46 prisoners, and in 1842, only 53; in the early part of 1843 they had increased to 225; and at the time the report was made,—when the total number of prisoners in one of the largest gaols in Ireland was 76,—62 of that number were confined for breaches of the revenue laws. The Scotch and Irish distillers are said to manufacture 20,000,000 gallons of spirits out of the whole 26 millions made in the country. The recent confirmation of the rule compelling the distillers of Scotland and Ireland to pay duty on their spirits at the “worm's end,” and to sustain the loss of all leakage and escape while their spirits remain in bond, will, probably, merely lead to further evasion of the excise and custom rules.



tion. The cheapness of Beer and Spirits, and the gross adulteration of those Liquors constitute the head and front of the present evil. The Law may be powerless in directly opposing the sale of Beer and Gin, but it is capable of checking the sale of Beer impregnated with salt and copperas, and of Gin poisoned with turpentine and white vitriol. Let it become a rule that the penny-worth of Beer shall exercise its due power in refreshing and in quenching thirst, and that the three half-penny-worth of Gin shall produce no more diuresis than its own spirit and juniper can effect,—and we may safely declare that half the ills of excessive drinking will disappear at once,—the evil act will be less frequently repeated, and its physical consequences will be rendered infinitely less pernicious. It is remarkable how long the constitutions of habitual tipplers, who possess a critical taste in the quality of their liquors, often hold out before the final shattering comes.\*

Measures of this kind could scarcely become unpopular; indeed, the popular feeling would be readily enlisted in their favor. The closure of every gin-shop in a given district could scarcely fail to occasion an emeute; but the summary emptying of a few hogsheads of adulterated spirit into the sewers would be an event which, occurring every week in every street of the Metropolis, would be viewed and enjoyed by the populace merely as a well-merited act of retributive justice upon a common enemy†.

It is a happy feature in our present condition that, notwithstanding the vast amount of this species of debauch that

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\* The following pertinent remarks appeared in an account of the "Drink Doctor"—a species of reptile which has been generated in the foul quagmire of London vice.—"The flood of life-destroying liquor sold in London daily under the names of 'Cordial Gin,' 'Cream of the Valley,' 'Old Tom,' and a dozen of other popular appellatives, are all so many specious mixtures, having pure unsweetened spirits as a basis, made up to suit the taste of the London Drunkard. Were the spirit retailed to the public in the same condition in which it is consigned by the distiller to the publican, the latter would soon find his customers reduced to less than a tithe of their present number. The mild, though potent, flavour of unmixed spirits has not sufficient zest for the dregs of the London population, who are the principal supporters of the gin-shop: they look for the fiery sting that vitriol imparts, which they relish for its fatal warmth and consider as a proof of the genuineness of the poison they imbibe. Moreover, they require it highly sweetened; and in this they are amply indulged by the 'Doctor,' who knows that their depraved taste is rather excited than satisfied by sweetened spirits."—*Curiosities of Roguery*.—*Chambers' Jour.* April, 1850.

† The recent infliction of a fine of one thousand pounds upon a culprit found guilty, in London, of manufacturing a certain compound in imitation of, and to be used as a substitute for, malt and hops, must be regarded as an important sign of the times.



still prevails amongst us, the vice of intoxication is regarded by most of our statistical authorities as decidedly upon the decrease in England and Wales.\*

\* Dr. Price stated that the use of ardent spirits prevailed most in England and Wales in 1750 and 1751. In 1688-89 the annual average quantity of Excisable Brandy imported into the country was 1,713,974 gallons. In 1767-68, it was 1,612,601 gallons. The annual average of spirituous liquors drawn from malted corn, cyder, molasses, and brewer's-wash in England and Wales, in the following years, was—

			Estimated Population.
1692—1693	.. ..	2,329,487 gallons,	.. 5,134,516
1730—1731	.. ..	6,658,788 „	.. 5,687,993
1750—1751	.. ..	11,326,976 „	.. 6,039,684

In 1849, the quantity of ardent spirits consumed in England is stated by Mr. Porter to have been 9,053,676 imperial gallons.

A writer in the *Edinburgh Review* for April, 1851, adopts a very favorable view of the question. “Mr. McCulloch states the average consumption of wine in the United Kingdom to have fallen, since the close of the last century, from *three* bottles a man to *one and one-third*; and, from the last returns published, we deduce the following figures:—

From 1795 to 1804, we consumed, per head, 0·52 gallons of wine a year.

„ 1821—1824	„ „ „	0·22	„ „ „
„ „ 1842	„ „ „	0·18	„ „ „
„ „ 1849	„ „ „	0·22	„ „ „

“This is a most satisfactory result, but it is not generally known that the official documents relating to the consumption of beer and ardent spirits shew one not less satisfactory with regard to the increased temperance of the poor. For the first quarter of this century, the high duties on British spirits caused such an enormous amount of illicit distillation that no comparison can be instituted with that period. Since 1830, the following table shews the annual consumption per head in the kingdom:—

	1831.	1841.	1849.
British Spirits drank per head,	·90 ..	·77 ..	·84
Colonial, „ „	·15 ..	·09 ..	·11
Foreign, „ „	·05 ..	·04 ..	·08
	1·10	·90	1·03”

The reviewer regards the following table as still more clear and satisfactory, as shewing that there has been a large, and, on the whole, a continuous decrease in the use of ardent spirits in England and Ireland, and that the sole increase has been in Scotland.

Home-made Spirits charged with Duty.	1831.	1836.	1843.	1846.	1849.
	£	£	£	£	£
England, ..	7,732,000	7,875,000	7,720,000	5,634,000	5,318,000
Scotland, ..	6,007,000	6,621,000	5,593,000	9,560,000	10,445,000
Ireland, ..	9,004,000	12,249,000	5,546,000	8,333,000	8,117,000
U. Kingdom,	22,743,000	26,745,000	18,859,000	23,527,000	23,880,000

It is further maintained that the diminution in the consumption of Malt Liquor has kept pace with that in the use of ardent spirits. In 1830, the







the number of the population, we find that the temperance system has retrograded in Ireland during the last ten years.\*

In furtherance of the active exertions of the advocates of the Abstinence and Temperance Systems, the English Legislature has, of late, afforded many indications of a strong wish to restrain the use of intoxicating drinks by wise and moderate regulations. As far back as 1847, it was announced to be the intention of Government to prohibit, for the future, the sale of intoxicating liquors in Canteens; in 1850, it was ordered that a diminished allowance of spirits should be allowed to the Navy; and, at about the same time, the Peninsular and Oriental Company resolved to abolish the use of spirits altogether on board their vessels, except in cases of absolute necessity; providing that the seamen's pay should be raised five shillings per month, by way of compensation; and the experiment of supplying the Indian Army with malt liquor, in lieu of spirits, is now upon the tapis.

Some of the more feasible plans for the restraint of intemperance among the people at large are,—the introduction of

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shop; and that the quantity of spirits drunk in Glasgow was then twice or thrice (?) as much as in any similar population upon the face of the globe. The population of Glasgow was then 2,57,000; of these—Mr. Allison declared—80,000 have hardly any religious or moral education at all. A more recent Scotch authority, writing in 1850 (*Chambers' Journal*; August 17), remarks that drunkenness prevails to a more lamentable extent in and about Glasgow than in almost any other portion of Great Britain: and that the amount of misery and impoverishment caused by such indulgence is sufficiently apparent from the fact that the operative classes of that city squander, in intoxicating drinks, upwards of a million of money per annum. It is said, however, that drunkenness has been on the decrease in Glasgow during the last two or three years. In 1846, it was shewn that the fishing-village of New-Haven, near Edinburgh, had one public-house for every sixty inhabitants; in fact, that it would not be too much to say that every dozen families in the place maintained a public-house out of their earnings (*Ibid.* Nov. 1846). In the following year, the *Peebleshire Advertiser* shewed that, in the county of Peebles, there was one public house to every 42 males between the ages of 15 and 65,—a similar average for the burgh alone, shewed one public-house for every 22 males!—A grievous falling off, indeed, from the ancient Scottish practice celebrated by worthy John Bellenden who describes that “all dronkatis, glutonis, and consumers of vittalis mair nor was necessar to the sustentation of men, war tane, and first commandit to swelly thair fowth of quhat drink thay plesit, and incontinent thairefter was drownit” (duckit?) “in ane fresche rever.”

\* It is stated that in the year 1838, the quantity of spirits distilled in Ireland was 12,296,342 gallons. In the year 1840, after Father Matthew had entered upon his benevolent mission, the number of gallons distilled sunk to 7,401,051: in 1849 the quantity distilled was 6,973,333 gallons; thus far the figures tell favorably;—but it is reported that, in 1850 and 1851 the quantities rose to 7,086,374 and 7,415,297 gallons.



Cheap French Wines, as substitutes for ardent spirits; the supply of reading and lecture rooms, and all the other appliances of mechanics' institutes, in opposition to the beer-shops and gin-palaces;\* and the judicious exchange of good and well-cooked food for unwholesome liquor.†

It is a singular and unfortunate truth, often commented upon by our continental neighbours, that—although blessed with incomparable appetites, and generally supplied with sufficient means of satisfying them—our lower classes

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\* "The Beer-shop and Gin-shop are frequented because they supply, in their degrading sociality, the materials which their frequenters have not within themselves, and too often cannot find in their own families at home."—*Dr. Forbes*.—The following sensible remarks are from a report lately made by the Inspector of Prisons in Scotland, Northumberland, and Durham, in which that authority enlarges upon the serious amount of crime which results from drunkenness throughout the country:—

"The sobriety in many parts of the continent appears to me to be caused by the greater prevalence than with us of physical pleasures, such as music and dancing, the abundance of cheap wine, of so mild a kind that it can scarcely intoxicate, and the prevalence of social and mental pleasures of a sort that can be enjoyed by all classes, such as access to public walks, picture galleries, &c. In this country, some of these innocent and rational pleasures, instead of being encouraged, are discountenanced; and the consequence is, that many persons who would otherwise engage in them fall into the debasing indulgence of drunkenness; or if they resolutely seek the other better pleasures, they are often driven in quest of them to the houses of disreputable persons, instead of enjoying them in the open day, in the presence, and with the approval and sympathy of, respectable friends and neighbours. Among boys and girls in manufacturing towns this want of innocent and rational amusement is a fertile source of crime. The spontaneous delight of the children in dancing and singing, seems to show that music and the dance are natural pleasures, and in themselves perfectly innocent, and that to endeavour to suppress them is to oppose the intentions of an all-wise and benevolent Creator; but the purest gratifications may, by the discountenance of the best educated and most moral classes, be rendered corrupting, by causing them to be indulged in by stealth, and with the idea that they are sinful. Instead of attempting to uproot such pleasures, these classes in society would, in my opinion, do good service to morality by encouraging them, within due bounds, by their presence and support."

† This point is rightly insisted upon in Mr. Robert Wilson's "Social Economics"—"One reason why the temperance movement has been arrested in this country" (Scotland) "is, that while one sensual gratification was withdrawn, another was not provided. The intellectual excitements which were offered as a substitute have not been found to answer the purpose. Our temperance coffee-houses are singularly deficient in gastronomical attraction; and the copious decoctions of coffee and chicory which are there served up, with that nauseous accompaniment—battered toast—are more calculated to create a craving for stimulants than to allay it. The lower classes, in Scotland, are as deficient in knowledge of cookery as the natives of the Sandwich Islands; and if our apostles of temperance would employ a few clever cooks to go through the country, and teach the wives and daughters of the working men to dress meat and vegetables, and make soups, and cheap palatable farinaceous messes, they would do more, in one year, to advance their cause, than in twenty, by means of long-winded moral orations, graced with all the flowers of oratory."



feed worse, and study the leading principles of gastronomics less than any people in the world, except, perhaps, the Esquimaux and the Caribbean anthropophagi.

No one would attempt to question Prior's maxims:—

“—if you would improve your thought  
You must be fed as well as taught.

\* \* \* \* \*  
Observe the various operations  
Of food and drink in several nations.  
Was ever Tartar fierce or cruel  
Upon the strength of water-gruel?  
But who shall stand his rage and force  
If first he rides, then eats his horse?”\*

Unfortunately, however, horse-flesh forms too plentiful a constituent in English diet. Next only to the evil of starvation, is that of feeding ravenously upon coarse, ill-cooked, greasy, doughy, or otherwise indigestible, food. Faulty assimilation giving rise to an anxiety, nay—a necessity—for stimulants. Disorder of the liver and other excretory orders, calculous and rheumatic affections, with a long train of other diseases arising from imperfect and depraved nutrition, are the natural results of the style of diet to which, with comparatively few exceptions, the labourers, the artizans, and even the poor gentlemen of England, are almost hopelessly doomed. The views of Mr. Wilson on this subject are well deserving of attentive thought. Liebig has shewn that total abstainers require much more food than wine-drinkers. The fair compensation of the abstainer assuredly is that his food should be abundant, savory, and well-prepared.

The moral cure of intemperance in civilised countries still appears to be too remote to be successfully dealt with, at present, by practical philanthropists. Indolence, Ignorance, Excessive Toil, Want of Work, an over anxious Contest with the Vicissitudes of Life, Crime, Destitution with undue Exposure to the Elements, and Evil Example, are alike the most prevailing causes of Intemperance and its nearly inevitable consequences, among a thinking people. These are evils which are all so intimately bound up with our social system, that we can only hope for their reduction after the active exertions of many generations of moral and political reformers, aided by the Divine Blessing, have rendered mankind, in the aggregate, capable of feeling and acting as rational and Christian beings.

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\* *Alma* : c. iii.



V. *The proper Building, Ventilation, Lighting, and Draining of Houses:—Particularly those of the Labouring Population.*

One of the first, as it has always been one of the most difficult and thankless, duties of Government is that of thoughtfully consulting the interests and welfare of those who possess neither the inclination nor the power to strive energetically and with success against the evils which beset them;—of those numerous members of the State who are poor, alike in means, in knowledge, and in energy. Here a moderate absolutism, of course, has the advantage over every other kind of legislative control. These self-evident principles no where find stronger illustration than in the numerous objections and impediments which have invariably been thrown in the way of our law-givers, whenever they have attempted to introduce salutary restrictions in the building, ventilation, and drainage of towns. As inevitably as the first application of soap and water elicits a yell of rage and disgust from a radically dirty child, so certainly have all attempts to carry the work of sanitary improvement into the filthy holes and corners of English towns, been met with the ignorant petulance and obstinate resentment of rate-payers, proprietors, contractors, town councillors, and other representatives of parochial self-interest and prejudice. “He,” says the ultra advocate of the rights of man, “is not a free citizen who,—having purchased certain square feet of ground, it matters not where, whether in the line of a noble street, or upon the confines of a palace court, or of a cathedral precinct, near the wall of a crowded hospital, or by the margin of a public garden,—may not proceed to erect upon his freehold a hovel, a manufactory, or a slaughter-house; or to lay out the ground as a tan-yard or a straw-yard, a piggery, a knackery or a tallow factory; or, in short, to use or misuse it in any other manner which his caprice or interest may suggest. He has become ‘spacious in the possession of dirt,’ and he ought to be free to amplify his possession by any practicable device. The earth and the air are absolutely his, ‘up to heaven and down to hell’—as the old charters phrase it;—and has not a man a right to do what he will with his own?” Until recently, such has been the view generally entertained by English citizens; and such, almost literally and universally, has been their practice. Had this not become the time-honored usage, the sanitary reformers



of the present day would find the task before them comparatively light. Latterly, the law has so far checked these "freedoms of the city" as to visit somewhat heavily the culprit who shall endanger the health of others by establishing any egregious nuisance on his premises; but the legislature has not yet fully succeeded in removing that prevalent suicidal or murderous propensity which surrounds itself and its dependents with every attainable drawback to healthy respiration.\* There may still be discovered many favored spots, throughout the length and breadth of the three kingdoms, in which a man might, if he chose, erect any conceivable number of houses, without drains, water-supply, or efficient means of ventilation, and with each of the apartments five feet square, should he so order it; and in these dens he, his tenants, or his workpeople might exist, undisturbed by prying inquisitors, as long as pestilence would allow them. Many of the leading rules

\* In January 1845, a law came into effect, regulating and prescribing the height of houses in proportion to the width of streets; the dimensions of of courts and back-yards of dwelling-houses, so as to insure proper ventilation. It also regulates the size of windows. Dangerous trades or occupations are not to be carried on at a distance of less than forty feet from any house; and offensive or noxious occupations, such as blood, bone, tripe, or soap-boiling, fell-mongering, tallow-melting, slaughtering of animals, must not be kept up within less than fifty feet of any dwelling, or forty feet of any public way. It is added that, in thirty years from the date of the Act, it shall cease to be lawful to continue to carry on such business in such situation. By this Act, the use of cellars, as dwellings, was prohibited, under certain conditions. In 1848, another Act was passed, regulating the construction of vaults, cellars, and drains; and directing that no house shall be built or repaired below the ground floor, without proper covered drains communicating with a sewer, or without ash-pits and privies. This Act also provides for the registering of Lodging-Houses, and for the limitation of the number of their inmates; it prohibits the use, as dwelling-apartments, of all cellars which are less than seven feet high, three feet being above the street, and which are not properly drained, and provided with all essential conveniences. These laws received some amplification in 1849. It will be perceived that these enactments, judicious and valuable as they are, have the, perhaps, unavoidable fault of merely exercising a prospective control upon building operations. At the passing of the first mentioned Act, there were scarcely less than three hundred thousand houses in London alone, each of which may, up to the present time, be rife with all those inconveniences against which the Act is directed. This measure passed twelve months previously to its being carried into effect. It was observed that, during the interim, houses of all the prohibited kinds sprung up in immense numbers upon nearly every available spot of ground in and around the Metropolis.

The Sanitary Act of August 1848 embodied the following important regulation:—*One-tenth of the poor-rate payers in any town may petition for an inspector to visit and report on the state of the locality; or, if, on an average of seven years, the Registrar General finds the deaths to exceed 23 in 1,000, the Central Board of Health may then, on their own responsibility, send down an Inspector, and issue a provisional order according to circumstances.*



of our new sanitary and building Acts have met with so much crafty and underhand opposition and evasion, that it may be fairly doubted whether the mode of constructing houses, in the town districts of England, has been materially improved under the present regulations; and the necessity of securing the proper construction of country dwellings has been, in great measure, practically overlooked. Still, the idea of building systematically, with a view to the health and convenience of all classes of the public, is rapidly gaining strength and consistency. The Government have long been alive to its necessity; it has been rather fully carried out in some of the Colonies, and more than one Society is in active operation for its extension at home.\*

\* The principal of these is the *Metropolitan Association for Improving the Dwellings of the Working Classes*, which was formed in 1844, with a view "to enable the laboring man to procure a comfortable, cleanly, and healthy habitation at a *less expense* than is at present paid for very inferior and unhealthy accommodation, arising from want of ventilation, bad drainage, and the crowded state of the apartments."—"To effect this," the Society proposed "to erect, 1st—dormitories for single men, or large rooms divided into compartments, with a separate bed to each occupier, which could be afforded at as low a rate as is paid at present by each person when 3 or 4 sleep in one bed; 2nd—well-drained and ventilated buildings to be let to families in sets of rooms, with an ample supply of water to each floor." It was recently announced that the Association had "its entire capital in a state of remunerative reproduction." At the Association's sixth annual meeting, Dr. Southwood Smith gave a striking account of the salubrity of the Metropolitan Buildings. During the last year (1850-51,) there were only 7 deaths out of 571 residents, being a rate of mortality of 1·2 per cent., or one-third less than the mortality of Lewisham, the healthiest district of the Metropolis; and one-half less than the mortality of the parish (St. Pancras) in which the establishment is situated. Out of 352 children, there were only 4 deaths, or 1·1 per cent., proving that the children enjoy a degree of health almost unexampled; the general mortality among children in the Metropolis under 15 years of age, on an average of five years, being 3·4 per cent., or more than three times greater than in this establishment. During the late epidemic, there was not a single case of cholera in the establishment; though, at a distance from it of not more than 400 yards, 3 deaths occurred in one house; and, in one spot, within a space of 200 feet in length, there were no fewer than 20 fatal cases. Within the preceding two months, 72 cases of fever had been received into the fever hospital from the courts of Gray's Inn Lane alone; 11 from one house; and 20 cases were stated to have occurred in a single house in Tindall's Buildings. Yet there had not been a single case of fever in the Metropolitan Buildings from their first opening, 3 years ago; nor had a single case occurred in any similar establishment in the Metropolis, including even the lodging-houses for single men. These facts, said Dr. Smith, more than realised the most sanguine expectations of the efficacy of sanitary arrangements in the prevention of disease, and proved that typhus and other forms of fever were more under our control than any one had been prepared to expect. They afford the highest reward for past exertions, and the best encouragement to perseverance.—*Household Words*: June, 1851.

The plan adopted by the Birkenhead Dock Company, in the construction of dwellings for their workmen,—about 300 of which were opened in 1847,



The value of "Sailors' Homes," of that very important establishment "The Governesses' Institution," of the "Home for Distressed Needlewomen," &c. need not be enlarged upon here. It is to be trusted that, year by year, such institutions will increase in number and scope throughout the country. At present, lodging houses for respectable females and for women servants out of place are especially needed in all the larger towns. It is a subject for congratulation to England that the practically benevolent mind of Prince Albert has entered fully into the important measure of procuring wholesome dwellings for the working classes.

—appears to include most of the requirements of healthy residences for the poor in temperate climates. The *Liverpool Mercury* describes these buildings as being erected on the plan of the houses in Scotland, each tenant occupying a "flat;" and, as they are four storeys in height, eight families are accommodated in each house. Of course there is a common staircase for the use of the eight families, but the stairs once ascended, each residence is quite distinct. Most of the cottages consist of three apartments,—a kitchen, and two bed-rooms. The kitchen is fitted up with a grate, oven, &c. There is also a small scullery, containing sink-stone, water-pipe, with the water constantly on, bunker for coals, shelves, &c. Adjoining is the water-closet, through which, to prevent offensive effluvia, all water from the pipe and sink-stone passes; there is a dust-hole in each scullery, into which sweepings, cinders, and all rubbish may be brushed, the occupants having no further trouble with them. The bed-rooms are supplied with iron bedsteads and wash-stands. Each room has a ventilator at the bottom and top, and the windows are so constructed that they can be easily opened for the further admission of air. There is also a cupboard in every cottage, and all the apartments are neatly prepared, painted, and fitted up with shelving, iron hooks for clothes, &c. The buildings are fire-proof, there being no possibility of the fire in one flat extending. The roof of each house is flat, covered with asphalte, and surrounded with a parapet wall. The rent of a cottage on the top storey is 3s. 6d. a week; on the third storey 4s.; on the second 4s. 3d.; and on the first 4s. 6d. There are cottages with two apartments, the rent of which is 2s. 6d., and others of four rooms, which are, of course, a little dearer. A lodging-house for families has recently been erected in New Street, Golden Square. Its cost is reported not to have exceeded £1,120, although the sum contributed towards the design was £1,400. The building is described as having four floors, and two (?) sets of apartments on every floor. Each set comprising three rooms, coal-cellar, a shaft for conveying the dust downwards, a meat-safe, sink, cupboard, and various other conveniences. On the basement floor are 4 wash-houses, each containing a copper for the use of two families; and every care has been taken to promote complete ventilation throughout the building. The rent has been fixed at the rate of 6s. 6d. a week for the first and second floors, and 4s. 4d. for the fourth. Many "fixtures" have been supplied which are not generally found in unfurnished houses. It is proposed to carry out a similar design in the parish of St. George, Hanover Square. A building of this kind, however, is too costly, affords too little accommodation, and has the rentals fixed too high to allow of its being considered as a really useful establishment. Families who can afford to pay six or seven shillings a week for apartments are scarcely fit objects for charity, and will generally be able to lodge themselves decently for that sum. What are most required are clean and well-ventilated buildings, well supplied with water, and affording decent accommodation at the rate of from two to three shillings per week. The



The close of another decade will, probably, find the landlords of the United Kingdom somewhat rigidly restricted in that portion of their boasted freedom which now leaves them at liberty to let, at exorbitant rates, filthy and dilapidated rooms in which fever is constantly laid on instead of water, and where leakages and thorough draughts take the place of ventilation, to unfortunate labourers and artizans whose avocations compel them to reside in particular localities.\*

frightful demoralization and squalor prevailing in the Lodging-Houses for the poor, which have long formed the main foci of crime and disease in the lowest quarters of London and of most of the large provincial towns of the three kingdoms, have given rise to the establishment of a considerable number of "Model Lodging-Houses" for the working classes. It is impossible to enter at length into the details which have been afforded of the beneficial working of this system: it may be sufficient to state that it has been practically shewn that, for the same charge (3d per night), which is usually paid at the filthiest night receptacles for trampers and thieves, the respectable labourer, who does not possess the comfort of a home, may obtain a clean bed in a wholesome, well-ventilated, lighted, and warmed room, together with the means of washing and cooking.

A paper which appeared in *Chambers' Journal* (March 8th, 1851) may be very profitably referred to, as fully detailing the extremely successful working of this system in Edinburgh, and in several other towns in Scotland. In 1850, three of the Edinburgh Model Lodging-Houses gave accommodation to 45,942 men, and 8,471 women,—(not including about 2,000 children, for whom no charge is made) or an average of 1,046 persons weekly. Late in 1851, the "Common Lodging-Houses Act" came into operation. "By the sixth clause of this Act, the local Magistrate may give the keeper of every common lodging-house, within his jurisdiction, notice in writing of this Act, and require him to register his house, under a penalty not to exceed £5 for every lodger he received into his house while not registered. The house to be registered free of charge to owner. It will not be in the power of any person keeping a lodging-house to receive lodgers therein after one month from the service of the notice, unless it has been inspected and duly approved of by an officer appointed for that purpose. The authorities will have the power of making bye-laws for the well ordering of these houses, and the separation of the sexes therein; and also the power of imposing penalties on the offenders against these regulations. When a person is ill of fever or any infectious or contagious disease, in any of these houses, the keeper is bound to give notice of the circumstance before eight and forty hours, under a penalty not exceeding £5. To be liable to a farther penalty not exceeding 40s., for every day during which the offence continues. Free access must be afforded to officers appointed for purpose of inspection, &c. The rooms, passages, stairs, floors, windows, doors, walls, ceilings, privies, cesspools, and drains, must be thoroughly cleansed, and as often as required, or in accordance with any regulation of the authorities. All justices and constables shall have full jurisdiction, powers, authorities, and indemnities, for executing the provisions of the Act."

\* In writing on the Mortality of Brussels, M. Duepetiaux enquires,—“Is our respect for the rights of property to be carried so far as to endanger the public health and security? The rights of the proprietor are necessarily limited by the rights of society. That limit is inscribed upon nearly every page of our law. Why does it not also exist for the speculator who lets his houses to the workman and indigent? We impose rigorous conditions on the sale of commodities; we confiscate, without hesitation, meat of bad qua-



*Ventilation.*—The principle of ventilation is, simply, that a constant stream of pure air should circulate through every inhabited room in sufficient quantity to supply the loss of oxygen, resulting either from respiration or combustion, which is going on within. An inlet for cool, fresh, air from without, and an outlet for the heated, de-oxygenized, and carbonized, air, animalized exhalations, dust, &c.\* from within, are, therefore, the primal essentials in what is termed the “natural ventilation” of an apartment. Hence, also, the principal inventions for “artificial ventilation” consist in the construction of free openings generally placed low, towards the floor, with fires or pumps to draw pure air into otherwise close apartments, together with chimneys, windows, funnels, &c., placed high up, for the escape of the effete air and carbonic acid, the passage of the outward current through these also being, in some cases, assisted by the rarefying power of heat, or by revolving fans, exhausting pumps, &c. Simple and plain, in theory, as are the principles of natural and artificial ventilation, they are often found to be extremely difficult of application, especially in apartments where the maintenance of warmth is no less essential than the free renewal of air. Where a motive power is required in artificial ventilation, it will usually be sufficient that the outward flow of air should be assisted; this will always ensure an abundant indraught where sufficiently free afferent openings have been provided. With a thoroughly conducted system of ventilation, small,

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lity, putrid fish, adulterated liquors, and bread below the legal weight: and we not only confiscate these things, but we punish their owners. By what strange contradiction do the proprietors of these hideous dens, these infectious holes—to inhabit which is at least as dangerous as the use of the most unwholesome food—not only remain unpunished, but continue to enjoy a peculiar protection, and a sort of privilege, inasmuch as they are exempt from the greater part of the conditions imposed upon other proprietors? If we forbid the sale of arsenic, &c., why do we allow a host of wretched beings to perish by slow poison in the unwholesome habitations in which they are necessarily confined?”

\* In a Report on the Air and Water of Towns, read before the British Association, Dr. Angus Smith has shewn that the pollution of air in crowded rooms is really owing to the presence, not merely of carbonic acid, but of organic matter; that this may be collected from the lungs, or breath, and from crowded rooms indifferently; that it is capable of decomposition, and becomes attached to bodies in an apartment, where it decomposes, especially when moisture assists it; that this matter has a strong animal smell, first of perspiration, or, when burnt, of compounds of protein, and that its power of supporting the life of animalcules proves it to contain the usual elements of organized life. Dr. Smith does not agree with those who attribute the unwholesomeness of crowded rooms to carbonic acid. “Experiments with the pure acid have been contradictory to their statements.”



low rooms would, of course, be as healthy, in regard to mere respiration, as wide and lofty apartments; but, here the evil of draughts would be incurred; under all circumstances, therefore, our national attachment to small, snug, cosy, penetralia is a serious practical error.\* To secure an equable atmosphere, whether artificially warmed or otherwise, the room must be wide and lofty; and, however large its space may be, its ventilation must be aided by fire draught, or by some other exhausting force whenever the crowding is great.

Some physiological writers tell us that the quantity of air which passes through the lungs of an adult male in the 24 hours, is about 266 cubic feet, and that the quantity of carbonic acid evolved from his lungs and skin, during the same period, rather exceeds 21 cubic feet.† Others consider that the quantity of air daily required in respiration by a human being is about 57 hogsheads.‡ Again, we are told that thirty-six hogsheads is nearly the proper quantity, and that "to live and to sleep in a space of less than from 400 to 500 cubic feet for each individual is not compatible with safety to life, unless precautions be taken for the renewal of air for ventilation."§ The Inspectors of Prisons allow 1,000 cubic feet of air to every individual; Sir George Ballingall thinks the same quantity a fair allowance in European general hospitals; the new Act for improving the condition of Merchant Seamen demands a space of nine superficial feet, with proper ventilation, for each man. In making practical arrangements for ventilation, however, it will be safest to adhere constantly to the principle that, in respect to its supply of air, every partially closed room should be placed, as nearly as possible, under the circumstances of the respiratory apparatus of an air-breathing animal,—having adequate apertures for the admission of air, sufficient space for its free diffusion

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\* In the celebrated letter already quoted, Erasmus made the following wise remarks on English ventilation. "First of all, they are totally regardless concerning the aspect of their doors and windows to the east, north, &c.; then they build their chambers so that they admit not a thorough air, which yet, in Galen's opinion, is very necessary. They glaze a great part of the sides with small panes, designed to admit the light and exclude the wind; but these windows are full of chinks through which enters a percolated air, which, stagnating in the room, is more noxious than the wind." He adds his conviction that the island would be far more healthy, if the chambers were so built as to let in the air on two or three sides, with such glass windows as might either be thrown wide open, or be kept quite shut, without small crevices to let in the wind.

† Carpenter.

‡ Southwood Smith.

§ Report of the General Board of Health, 1850.



without the concentration of direct currents, or draughts, and free openings for its exit; some natural or artificial motive power being also required within or without the apartment to keep the current in continual flow. Under these circumstances, considerable economy of space is attainable. In the erection of Infirmaries, Barracks, Jails, and other large buildings, this fact appears to be frequently overlooked;—the size of the apartments must always be in an inverse ratio to the architect's success in diffusing a supply of air throughout them.\*

\* Several interesting facts have recently been adduced with regard to the constituents of air and the means of testing its purity. Professor Liebig has discovered a mode of determining the amount of oxygen in the atmosphere, founded upon the remarkable absorbent capacity of pyro-gallic acid. The process is described as follows (*Chemical Gazette*: February 1st, 1851, and *Bengal Hurkaru Medical and Scientific Gazette*: April 19th 1851):—The air in which the amount of oxygen and carbonic acid was to be determined, was measured in graduated tubes over mercury. The tubes would contain about 20 cubic centims. divided into 5 parts; they were filled with the air, and the quantity read off; and now  $\frac{1}{30}$  or  $\frac{1}{40}$  of its volume of solution of potash of 1.4 sp. gravity (1 part dry hydrate of potash to 2 parts water) was introduced by means of the common pipette with a curved point: by quickly moving up and down the tubes in the mercury, the volume of potash is spread over the whole inner surface of the tubes; and, when no further decrease of space is perceptible, the decrease of volume is read off. When the air has been previously dried, by means of chloride of calcium, the decrease in volume accurately furnishes the amount of carbonic acid in the air; but, if it were moist, the determination has an error attached to it, which is owing to the strong action of potash. After the carbonic acid has been determined, a solution of pyro-gallic acid, containing 1 grm. of acid in 5-6 cub. centims. water, is introduced, by means of a second pipette, into the same tube, and amounting to about half the volume of the solution of potash;—the mixed liquors are well shaken over the inner surface of the tube, and, when no further absorption is perceptible, the amount of nitrogen remaining is measured off. By mixing the solution of pyro-gallic acid with the potash, the latter is diluted, and an error arises from the diminution of its tension; but this appears to be so exceedingly small that it is not determinable; at the same time, it may easily be avoided, if, after the absorption of the oxygen, a piece of solid hydrate of potash, corresponding to the amount of water in the solution of pyro-gallic acid, is introduced, and its solution awaited. Gallic acid answers, but its action in absorbing oxygen requires from  $\frac{1}{2}$  to 2 hours, instead of as many minutes. Dr. Stenhouse obtains the acid by sublimation from the dry aqueous extract of the gall-nuts, precisely in the same manner as benzoic acid is prepared from benzoic resin. Above 10 per cent of sublimed acid is procurable from the extract.—*Liebig's Annalen*: Jany., 1851. p. 107.

Upon Faraday's recent demonstration of the facts, that "oxygen is attracted by the poles of magnet, while nitrogen is repelled:"—"that oxygen stands in the same magnetic relation to gaseous bodies generally, as iron to the other metals;"—and "that, whenever it is brought into combination with carbonic acid, and other gases, and phosphorus, it immediately loses its magnetic property:"—it has been ingeniously enquired—"Have we not here a key to the causes of epidemics? Admit that oxygen possesses a protective quality—in virtue of its magnetism—and that it loses this when interfused with



The ill effects of imperfect ventilation have been recognised in all times, although the evidences of such intelligence, as displayed in the generality of ancient and modern buildings, are, unfortunately, of rare occurrence. Of late, the subject has been over-written, and in a great measure practically neglected. The quotation of a few of the multitude of recorded facts, demonstrative of the injurious effects of imperfect ventilation upon animal existence, will be sufficient here.\*

We have already seen that the mortality in the various districts of London, for the most part, increases in proportion as the density of the population is greater. It is noticed that in places where the density of the population is equal, the number of deaths appears to depend mainly upon the degrees of Ventilation and Cleanliness which obtain. Epidemic diseases are observed to be attended with nearly double the fatality in the crowded parts of the Metropolis that attends them in the more airy districts; and diseases of the respiratory system are increased 50 per cent. in close neighbourhoods.†

Mr. Toynbee, in his evidence before the Health of Towns Commission,‡ stated that defective ventilation appeared to be the principal cause of the scrofulous affections which abound to an enormous degree in England. Whenever a scrofulous patient has come before him, he has always been able to trace this as one of the causative agents. He cites the opinion of M. Bandeloque, who states that "the repeated respiration of the same atmosphere is the cause of scrofula;

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miasmatic exhalations from towns or waste lands, would not the supposition assist in accounting for the diseases said to be propagated by atmospheric influence?"

\* A beautiful illustration of the "miraculous" effects of ventilation is given in the history of Adela, countess of Blois, the youngest daughter of William the Conqueror. In 1098, this Princess was attacked with fever, all medical aid failed, and the last hope was placed upon a certain St. Agiles, who was buried at the monastery of Reshac, in La Brie, and whose reputation for wonderful cures had spread far and wide. Hither, therefore, she was conveyed and placed in the chapel, immediately before the tomb of the saint; and, at night, she was permitted neither food nor drink. During these hours of stillness, we are told, "she felt the divine virtue coming upon her, the burning fever heat passed gradually away, and what could not be obtained by the aid of medicine, was obtained through the intercession of the blessed St. Agiles." Or rather, we must consider with Mrs. Green, who narrates this fact, that the countess doubtless felt the advantage of being removed from the confined atmosphere of a crowded room, kept purposely as warm as possible, into the silent and breezy chancel. Fever must have been almost certain death, when it entered a turret chamber in one of Earl Stephen's three hundred and sixty-five castles.

† McCulloch's "London."

‡ Report, vol. 1.



and that if there be perfectly pure air, there may be bad food, bad clothing, and want of personal cleanliness, but that scrofula cannot exist." It is further argued that, "the development of scrofula is constantly preceded by a sojourn, more or less prolonged, in air which is not sufficiently freshened. It is impossible to deny that hereditary disposition, the lymphatic temperament, uncleanness, want of clothing, bad food, cold and humid air, are, of themselves, non-effectual for the production of scrofula. When it is seen, on the other hand, that this disease never attacks persons who pass their lives in the open air, and manifests itself always when they abide in an air which is un-renewed, and this, whatever may be the extent of other causes, it appears evident that the non-renewal of air is a necessary condition in the production of scrofula. Invariably, it will be found, on examination, that a truly scrofulous disease is caused by a vitiated air, and it is not always necessary that there should have been a prolonged stay in such an atmosphere. Often, a few hours each day is sufficient; and it is thus that persons may live in the most healthy country, pass the greater part of the day in the open air, and yet become scrofulous, because of sleeping in a confined space where the air has not been renewed. This is the case with many shepherds. It is usual to attribute scrofula, in their case, to exposure to storms and atmospheric changes, and to humidity. But attention has not been paid to the circumstance that they pass the night in a hut which they transport from place to place, and which protects them from wet; this hut has only a small door, which is closed when they enter, and remains closed also during the day; six or eight hours passed daily in vitiated air, which no draught ever renews, is the real cause of their disease. I have spoken," continues Mr. Toynbee, "of the bad habit of sleeping with the head under the clothes, and the insalubrity of the *classes* where a number of children are assembled together." The following is quoted from Bandeloque.—"The village of Oresmeaux is situated in a vast plain, open on every side, and elevated more than 100 feet above the neighbouring valleys. About sixty years ago, most of the houses were built of clay, and had no windows; they were lighted by one or two panes of glass fixed in the wall; none of the floors, sometimes many feet below the level of the street, were paved. The ceilings were low; the greater part of the inhabitants were engaged in weaving; a few holes in the wall, and which were closed at will by means of a plank, scarcely permitted the air and light to penetrate into the



work-shop. Humidity was thought necessary to keep the threads fresh. Nearly all the inhabitants were seized with scrofula, and many families, continually ravaged by that malady, became extinct; their last members died *rotten with scrofula*. A fire destroyed nearly a third of the village; the houses were rebuilt in a more salubrious manner; and, by degrees, scrofula became less common, and disappeared from that part." Mr. Toynbee further argues that "defective ventilation may be considered one great cause of all the diseases of the joints" (again struma) "which we so frequently meet with; as well as of the diseases of the eye and skin,—shingles, lepra, and *porrigo*, or ringworm. Besides the eye, the ear is injuriously affected by vitiated air, which thus becomes a cause of deafness. It is a fact, that at least two times more of the children of the labouring classes are affected with ear-ache and deafness than of children of the rich and better conditioned classes less exposed to the like influence."\*

The Health of London Association allude, in their report, to Dr. Guy's calculation that of those who annually die of consumption in the Metropolis—2,500 might be saved by proper sanitary measures. One-sixth of that mortality is attributed to deficient ventilation of work-shops; while five-sixths are ascribed to the condition of the dwellings of the of the poor. It may be considered that none of the above views can be received as absolutely conclusive; still, they at least add detailed confirmation to the established principle that impure air is the surest of slow poisons.

\* Similar evidence has been adduced with regard to the developement of Cholera. It is argued in the Report of the General Board of Health for 1849-50, that the disease originates (?) and maintains its virulence chiefly from a want of ventilation. Other circumstances, such as intemperance, cold, deficient diet, and so on, materially contribute to predispose persons to the attack; but the substantial cause of Cholera, in the first instance, is here considered to be the breathing of impure air. In an article on the evils arising from ill-ventilation, the following observations occur—"It is known that when the atmosphere is in a choleraic condition, the over-crowding of human beings under the same roof and in the same apartment is almost invariably followed by

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\* Dr. J. Griscom mentions that 33,000 of the inhabitants of New York live in alleys and cellars, and that, in the latter, "fevers, rheumatism, contagious and inflammatory disorders, affections of the lungs, skin, and eyes, and numerous others, are rife, and too often successfully combat the skill of the physician and the benevolence of strangers."



an outbreak of the disease. A very remarkable instance of this kind occurred at Taunton, in the beginning of June 1849. The terrible rapidity with which the disease developed itself in the work-house of that town, at the period named, must be fresh in the recollection of the public. The girl's school-room was a slated shed 50 feet long, 9 feet 10 inches broad, and 7 feet 9 inches in height to the top of the walls; the roof was sloping. Into this shed, were thrust sixty-seven children. The epidemic influence was abroad:—here was a hot-bed prepared for its developement. The work-house was attacked, and in a week, sixty of the inmates were no more. It was in the girl's school that the mortality prevailed,—why should not the boy's school have equally felt the scourge? Simply, because the boys could not be kept from breaking the windows. To this circumstance, and to the better ventilation which was the result, the chaplain of the work-house attributed their immunity from disease." It is a fact, long and generally observed, that the severest outbreaks of Typhus occur in London during the cold months; evidently in consequence of the attempts made by the poor to secure the warmth of their wretched apartments at the expense of their ventilation. To this cause we may, probably, also attribute the prevalence of some of the extraordinary epidemics which have at various times desolated England. The Plague of 1348 began in *November*; the first two victims of the Great Plague of 1665 are stated to have died in Long Acre or Drury Lane late in *November*, or in the beginning of *December*, 1664. The Cholera of 1831 appeared in England in the *November* of that year; and we again find this scourge breaking out in London in *October*, 1848. It is mentioned in Simpson's Lectures to the working classes of Edinburgh—"that at a Christmas meeting in the Highlands, thirty-six persons danced the whole night in a small room with a low ceiling, keeping the windows and doors shut. The atmosphere of the room was noxious beyond description, and the effect was, that seven of the party were soon after seized with typhus fever, of which two died." This, however, is merely one of an almost interminable roll of instances which might be cited in illustration of the fact, that the poison of Typhus may, at almost any time, be brought into existence by crowding human beings within close unventilated apartments.

Second only in importance to the practice of securing a free ventilation of every inhabited apartment, is the disposition of towns in such a manner that the fresh air may



gain full and ready access to every street, and to the exterior of every house. Hence, all crooked thoroughfares, narrow ways, obscure alleys, back-to-back or clustered tenements, buildings arranged in the form of parallelograms and not freely pierced with windows and with lofty arches on each of the sides, and courts terminating in *culs de sac*, together with all large edifices jutting out from the line of street, or occupying the centre of the roadway, are, with good reason, the special aversions of sanitary reformers. In most of these cases, the only means of avoiding an almost constant liability to pestilential visitations in the districts thus viciously laid out—is, either to intersect them freely by straight ways, open to the currents of air which most prevail in those localities, or, where this appears impracticable or insufficient, to clear and rebuild such spots in toto. Very frequently, it will be found advisable to leave the spaces, which have been thus occupied, permanently open. In ancient towns, it was a common practice to fill spots of ground which appeared to be too wide for streets, and not spacious enough for squares, with dense blocks or edges of lofty, ill-constructed, buildings, which neither received due ventilation themselves, nor would allow the currents of air to pass freely by them. Such spots should, invariably, be cleared and left vacant; as they are well calculated to form reservoirs of air for the supply of the adjacent districts. Wren's Plan for the Rebuilding of London after the Great Fire of 1666,\* affords in this, as in many other respects, an unequalled model for the arrangement of a city.†

*Lighting.*—Modern scientific research has established the fact, that Solar Light is only of less importance than Air among the essentials for the preservation of healthy animal and vegetable existence. It has been demonstrated that

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\* Copies of this may be obtained from every English Printseller.

† In his "Address to the Middle Working Classes," Mr. Strange observes that—"Regard should be had to the direction of the prevailing winds, so that their currents may be more or less parallel with the rows of houses, for as large a portion of the year as possible. In England, it blows either to the West or East, or from the South or North-West, or South or North-East, ten or eleven months out of the twelve; so that a more or less East and West direction of the rows of houses will insure the most perfect access of fresh air." Again, Mr. Butler Williams enjoins that—to secure ventilation, the streets should be straight, and should radiate from a centre. They will then open directly on the surrounding country; and thereby the air will be most readily and continuously changed, and the pure atmosphere of the fields will rush directly through the town, attenuating the noxious gases, and revivifying the used air.



Plants are dependent upon the Sun's Light for their power of decomposing the carbonic acid, whence their foliage absorbs from the atmosphere the main constituent in the colouring matter of their leaves and flowers, and in the dense carbonized material of their woody fibre. Further, we observe that, in the gradation from the lower to the higher organisms, the developing power of this influence is most strikingly displayed. Wherever there is absolute darkness, vegetable and animal life are alike absent. The inner leaves of the unexpanded bud and flower, and the cellar-grown stems of the cress or the potato, are found to be equally wanting in normal development, in colour, and in the essential chemical principles of the plants. The *Proteus Anguinus*, of the sunless abyss of Adelsburg, is colourless, blind, and permanently stamped with a form which is evidently merely rudimental. In like manner, it has been shewn, by Dr. Edward, that if tadpoles be supplied with air and an abundance of fresh water, but deprived of light, the progress of their development into air-breathing animals is arrested, although their increase in size continues,—they remain overgrown tadpoles, breathing by gills. This author has also shewn that persons who live in caves and cellars, or in very dark and narrow streets, are apt to produce deformed children; and that men who work in mines are liable to disease and deformity, beyond what the mere closeness of their atmosphere would be likely to produce. The effects of the imperfect influence of the sunbeams throughout the arctic regions in stunting the growth of man and vegetables, are familiar to every one. The evidence given by Mr. N. B. Ward, upon this subject, before the Health of Towns Commission, is replete with interest. This Surgeon observes,—“During a practice of thirty years, in a densely-populated neighbourhood, my attention has been repeatedly drawn to the influence of Light, not only as a most efficient means of preventing disease, but, likewise as tending materially to render disease milder when it occurs, and more amenable to medicine and other treatment. Dupuytren (I think) relates the case of a lady whose maladies had baffled the skill of several eminent practitioners. This lady resided in a dark room (into which the sun never shone) in one of the narrow streets of Paris. Dupuytren was led to refer her complaints to the absence of light, and recommended her removal to a more cheerful situation. This change was followed by the most beneficial results; all her complaints vanished.\* Sir James Wylie has

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\* This is not by any means a fully demonstrative example.



given a remarkable instance of the influence of Light. He states that the cases of disease on the dark side of an extensive barrack at St. Petersburg have been uniformly, for many years, in the proportion of three to one to those on the side exposed to strong light." Upon these grounds Mr. Ward recommends the opening up of alleys and courts, so as to admit an abundance of light as well as air into the dwellings of the poor, believing that remarkable advantages to the general health of the inhabitants would ensue.

The discoveries of Morichini, Saverio Barlocchi, and Faraday, prove that Light is importantly instrumental in the development of electricity and magnetism. The deflection of polarized light by magnetism; the magnetizing powers of the coloured rays of the spectrum (especially of the extreme violet ray) on steel; the influence of the direct solar rays in increasing the strength of magnets; and the power of the same agency in producing a galvanic circuit;\* afford conclusive demonstration of the importance of the Sun's Light as a vitalizing agent. Imperfect nutrition, stunted-growth, pallor, and the development of strumous and other cachectic diseases—nay, even of the "Pestilence that walketh in darkness"—are the results naturally to be looked for, whenever the cheering and invigorating sunlight is prevented from being shed abundantly upon the bodies of children and men. The Parliamentary Session of 1851 has been distinguished by a wise and just enactment substituting a moderate duty on Houses for the tax hitherto levied on Windows. This measure, conjointly with the late reduction of the Duty on Glass, must now certainly leave the benefits of Ventilation and Lighting fully open to all classes of the community.

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\* Professor Barlocchi fixed the body of a frog, from which the skin and head had been removed, to a glass insulator, the crural nerve and spinal marrow being attached above to a wire connected with a small disk of copper blackened, and the legs being connected with a wire attached to a similar disk placed below: the apparatus was then exposed to the spectrum in such a way that the violet rays fell on the upper disk of copper, and the red rays upon the lower. When connection was made with the copper wires at the back of the apparatus, muscular contractions evidently took place in the body of the frog. The strength of these contractions varied with the vigour of the animal, the degree of light, and the state of humidity of the atmosphere. When the apparatus was removed from the spectrum to a shady place, where there was but little light, no contractions took place, on connecting the wires. Again, on gently warming, by a lamp, one of the disks, or any portion of the two wires which served to unite the nerves and the muscles, there was no change. Hence it would appear that the power which, in this case, stimulated the animal organs, and caused contraction, exists in Solar Light.—(*London Medical Gazette*: November, 1845. From an interesting abstract of the views of Morichini and Barlocchi.)



*Drainage.*—The leading requirements in the building of a town as regards its Drainage are,—

I.—That the site fixed upon shall be near, and very considerably above the level of, a large and rapid river or the sea.

II.—That, previously to building, the whole of the ground destined for the site, as well as its environs, shall be perfectly redeemed by drainage.

III.—That the permanent surface drains shall be small, numerous, well-constructed, and communicating as frequently and directly as possible with the sewers.

IV.—As regards the sewers;—that a branch shall traverse every street, that their diameters shall be as small as the calculated amount of water to be voided will allow; that they shall be constantly traversed by an abundant supply of tolerably pure water; and that they shall terminate, directly or by their mains, in the river or sea.

In principle, these rules apply equally to small villages and to separate dwellings.

I.—It is almost needless to insist upon the rule that no large town can be effectually drained unless it be ascertained, in the first place, that its site has that degree of elevation which will afford its sewers a sufficient descent for the free discharge of their contents.\*

II.—The necessity for the preliminary thorough surface and subsoil drainage of the building-ground of towns, as well as of the envioning district, appears to be an almost self-evident principle; but, practically, it is one which, in all times, and in all countries, has been deplorably neglected; and, even still, the minute sub-division of property, and the want

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\* A very moderate fall is required where the drains and sewers are properly constructed. Indeed, it has been unnecessarily insisted upon that a fall of one-tenth of an inch per mile will produce a motion in rivers. But it is, of course, evident that, to render the current sufficiently rapid and strong to prevent deposit, the descent should be considerable, especially where the channels are wide. It is usually considered that ditches and covered drains require a fall of at least one foot in six hundred. A few years since, it was remarked that "many parts of the Metropolis are under high-water mark or only a few feet above it. A sewer has to be constructed ten or twelve feet under ground," (?) "and is constantly so many feet lower than the Thames at high-water; and the drainage is impeded or altogether stopped, whilst the water in the Thames rises and falls to that extent." In a case like this, where it is neither practicable to build the houses anew upon a higher level, nor to raise the level of the sewers, it is evident that the remedy must lie in placing valves upon the outlets of the sewers and emptying them, whenever the inward pressure becomes great, by steam or other mechanical power. By skilful adaptation, the outward pressure of the river water might, doubtless, be made to assist rather than to retard the emptying of the sewers.



of concentration of interests and of controlling power render the evil one which admits only of gradual and tardy remedy in a very large proportion of our existing towns, and which can be wholly avoided only in newly selected localities. We have already seen that London itself,—one of the most favorably situated capitals in the world,—has been erected upon certain elevated spots, nearly surrounded by marshy ground, formed partly by the imbibition of certain rivulets from the hills which back the city to the North, and principally by the overflow and collection of water upon the alluvial flats which lie upon its river banks to its West, South, and East. Upon none of these oozy spots have the full resources of our system of drainage been expended. More than one of them has been gradually surrounded by buildings; and, at length, has been built upon itself, whilst its soil was still scarcely firmer than that of the marsh grazing lands of Essex and Kent. The remainder, although for the most part very extensively built upon, remain in the condition of partially reclaimed marshes, intersected by open ditches. Every stream which descends upon the landward side of a town is of priceless value, either as a source of pure water for the use of the inhabitants, or as a means of cleansing the streets, and of washing out the sewers:—no portion of water thus afforded will be permitted to soak into the earth in the rearward of a well-managed town.

It is evident that surface drains must always be, to a greater or less extent, the sources of contamination to the air of towns; but we cannot doubt that judicious arrangement and careful management of the superficial water-courses would render the evils, accruing from this cause, of very inconsiderable moment, even in the most crowded cities. It is to be trusted that, twenty years hence, it will be considered ridiculous to inveigh against the drainage of large and densely-populated town districts by open ditches; a good deal, however, may be said upon this subject, by the London sanitary reformers of the present day. The seventy miles of open water-course in the Surrey district of sewers, the open ditches of Wapping, Stepney, Hoxton and Rotherhithe, and the yawning pestilential gulf at the back of Field Lane,—“where from Snow Hill dark steepy torrents run,” and where now, as in Swift’s day,—

————— “prone to Holborn bridge,  
Sweepings from butchers’ stalls, dung, guts, and blood,  
Drown’d puppies, stinking sprats, all drench’d in mud,  
Dead cats, and turnip tops, come tumbling down the flood.”—



still form only a few of the standing evidences of the fact that London is yet scarcely to be regarded as a model city.\*

III.—House-drains and street-gutters can never be dispensed with, but they may be constructed upon Mr. Dyce Guthrie's plan,† in the form of earthenware or iron pipes of very moderate diameter, glazed within to prevent deposit; all unnecessary indirectness in their course to the sewers may be avoided; and the general adoption of simple valvular apparatuses or of effluvia traps at their orifices, as well as at their points of entrance to the sewers, appears to be perfectly attainable.‡

\* The "Report of the Health of London Association on the Sanitary Condition of the Metropolis" (1847) conveys the following deplorable facts:—"There are many open drains and open sewers which constantly emit deleterious gases, from the decomposition of animal and vegetable matter, and are certainly prolific sources of cholera, typhus, and scarlet fever and other diseases. Persons residing in the vicinity of open drains and open sewers often suffer seriously in their health and property. At Greenwich, there are open gutters and open ditches which, at times, give out most offensive effluvia, and in the neighbourhood of which illness of some kind or another, especially fever, is always prevalent. In Westminster, there are several stagnant and open drains from which, in many instances, malignant typhus and puerperal fever have arisen. At Rotherhithe, there is an open ditch which has given rise to typhus fever to a great extent, and there are also uncovered drains which receive the sewage of thickly populated neighbourhoods. At Poplar, the main sewer is partly uncovered and is called the "Black Ditch". It emits a most offensive stench and frequently produces headache, debility, and disorders of the digestive organs. In the district of the Lower Hamlets Commission of Sewers, there were, within the last few months, upwards of 10,000 feet of open sewers, many of which were in the crowded neighbourhoods of Mile-End, New-Town, and Bethnal Green."

† It is mentioned in "Sanitary Economy" that the system of using earthenware pipes for drainage has the authority of high antiquity and experience. Many architects and other men of science have observed the glazed stoneware pipes in the Colosseum, and Vitruvius recommends the use of earthenware pipes as both cheaper and more effective than any other kind (Lib. 7. cap. 7). Some very curious earthenware flue pipes, for the distribution of warm air, were lately discovered by Mr. Roach Smith, in excavating the remains of Lymne, in Kent, the *Portus Lemanis* of the Romans.

‡ There are few subjects more deserving the attention of practical mechanics than the construction of self-acting, air-tight, valves for kitchen and house-drains, and for the outlets of sewers. In 1847, Mr. Walker introduced a patent "Effluvia Trap" which was represented as having the advantages of not being affected by stones or rubbish passing through the grating, of being scarcely liable to be put out of repair, and of remaining free in frosty weather. The Commissioners of Sewers tested this apparatus in various parts of the Metropolis: but I am not aware whether it is still extensively employed. Some time since, it was stated in the *Times* that when a South wind blows into the open mouths of the London sewers at low-water, "the smell arising from the drains is most intolerable, especially if passing into a house which is shut up for the night. A medical man, who has an extensive parochial practice, has said very truly 'how the sewers can benefit the health of the poor living in courts and alleys, I am at a loss to imagine.



IV.—The principle that every street should have its branch sewer is nearly universally acknowledged ; but, at present, it is no where fully acted upon. It was long ago proposed in Parliament that “no houses should be built in future without sufficient drainage, and that the occupants of those already erected should construct drains, where requisite :”—and accordingly the Act of August 1848,—abrogating the regulations by which, in some English towns, all entrance into the sewers by house-drains or drains from water-closets or cess-pools was either “prohibited under a penalty” or “deemed the concession of a privilege,”\*—enjoins that no house is to be built or repaired below the ground floor without proper covered drains communicating with a sewer. This, doubtless has been found practicable enough, so far as it applies to the construction of house-drains, but it has proved a task of in-

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If every tenement is to have a communication with the sewers, you will create a greater nuisance, and the house will be more unhealthy than at present, arising from the smell of the sewer.’”

Dr. Rigby has given evidence that “these noxious effluvia are by no means confined to the dwellings of the working classes, but that they exist also in wealthy districts, and even in some of the newly-built houses in Hyde Park.” Among some useful remarks on this subject, in the “Manual of Public Health and Domestic Economy,” published in 1847 by the “Metropolitan Working Classes Association for Improving the Public Health,” Part I. it is mentioned that—“In Dean Street, Fetter Lane, are 7 gully holes in 55 yards. Instances are numerous where families have always been ailing who live in close proximity to these outlets, from the poison of the sewers ; and butchers and fishmongers complain of their meat becoming tainted.” In this useful tract a diagram is given of an exceedingly well, but simply, constructed valvular trap for street sewers adapted from a design of Mr. Flockton’s by Mr. Bingham of Reading. In 1843, Mr. D. Guthrie stated to the Commission, in his evidence on London sewers, that in narrow streets and densely-crowded districts, sheltered from the wind, “the inhabitants commonly infer a change of the wind from the offensiveness of the drains and sewers. Hence the tenantry of districts newly sewerred and drained, complain that they are worse off after the sewerage than before ; where the sewers are so constructed as to allow of accumulations, and the drains are inadequately supplied with water”. \* \* \* Mr. Guthrie further stated that, in a particular part of the districts in Sidmouth Street, there were three servants in one house who were taken ill with fever, and removed, and five of the family of children were also seized, and one died, as he apprehended, from that cause. In Gray’s Inn road another family had fever, but of a milder form ; that was more remote from this particular concentrated spot ; but, by and by, the same family that had the measles here, removed into the very house where this system of sewerage exists, and three children were immediately seized with scarlatina, and one died. These facts really parallel the adage,—“for the want of a nail the horse-shoe was lost, &c.” In all such cases, a few small and easily adapted metal plates would stand between death and households—nay, whole streets-ful of human beings.

\* First Report of the Health of Towns Commission of June 1844.



finitely more difficulty to proportion the extension of sewers to the growth of streets in the Metropolis.\*

The expense attendant upon the construction and maintenance of an adequate subsoil drainage in cities is exceedingly great—although it has been wonderfully reduced in the Metropolis under the administration of the new Commissioners,—and promises, hereafter, when certain new plans of drainage, presently to be noticed, have been brought fully into operation, to admit of still further abatement.† Deficient as London confessedly is in point of sewage, the progress of improvement in that respect has of late years been tolerably rapid.‡

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\* It was reported, that at the close of the year 1850, the then existing Commissioners of Sewers had decided upon a plan for the general drainage of London; the cost of the proposed works being estimated at £1,080,000. In September 1851, however, the Commissioners found themselves not only absolutely in want of funds for the accomplishment of this design, but unable to offer such security as would enable them to raise the money, or even a portion of it, unless aided by the intervention of Parliament. The Commission, however, is stated to receive about £80,000 per annum, upon a rate of 3d in the pound; this, they state, under present circumstances, will merely enable them to keep the sewers of London in as good a condition as possible, and to form new ones, wherever they are required, in such a manner as to render them, hereafter, portions of the more comprehensive system of drainage which is at present in abeyance.

† The Metropolitan Working Classes Association state the financial proposition in a very taking form—they say that “the estimated cost of all the great sanitary improvements suggested—water pipes, and an ample supply of water, main sewers, secondary drains, house-drains, water-closets, ventilating apparatus, scavengering, widening the streets, rent of public parks and gardens, salary of public inspectors of health, interest and fund for the repayment of capital—all this may be well done for 3½d per week to each tenement over and above the present rent, \* \* \* provided all parties are agreed.”

‡ One of the earliest records of the use of underground sewers occurs in the annals of the reign of Henry III. It is mentioned that the filth and refuse of the royal kitchens had long been carried through Westminster Hall: but it was discovered that the exhalations from this gutter created serious illness. An underground drain, communicating with the Thames, was accordingly constructed. It appears that the first attempt to drain London by sewers was commenced in 1428. We have already seen that, in 1531, an Act was passed appointing a Commission authorised to survey the then existing sewers and ditches of the city: still, it is evident that until a very recent period, the drainage of the town has not by any means kept pace with its increase. We are told by Lord Campbell that in 1672, Mr. Solicitor North, afterwards Lord Keeper Guildford, while residing in Chancery Lane, near Serjeants Inn, “acquired huge glory by constructing a drain for the use of the neighbourhood, a refinement never before heard of” (?) “in that quarter.” In 1722, we find Sir John Vanbrugh proposing a tax on all gentlemen’s coaches to supply a portion of the funds required for newly paving the cities of London and Westminster; for stopping all channels in the streets (a scheme worthy of the great architect); and for carrying all the water off by drains and common sewers under ground. According to *Knight’s London*, Messrs. Platt and Saunders state that,



A few years since, Dr. Southwood Smith is reported to have informed the Committee on the Health of Towns that,—“if you were to take a map, and mark out the districts which are the constant seats of fever in London, as ascertained by the Records of the Fever Hospital; and at the same time compare it with a map of the sewers of the Metropolis, you would be able to mark out invariably, and with absolute certainty, where the sewers are, and where they are not, by observing where fever exists; so that we can always tell where the Commissioners of Sewers have been at work by the track of fever.”\* A very similar testimony has been given by a sound observer with regard to Cholera.† On the other hand, Mr. McCul-

from 1756 to 1834, the number of sewers built, either wholly or in part, in the city district, was 114, some of them of very large dimensions, and that one third of those sewers had been made in the two years preceding 1834. In the Holborn and Finsbury division alone (cir. 1841) the length of main covered sewers was 83 miles; the length of smaller sewers, to carry off the surface water from the streets and roads, 16 miles; the length of drains leading from houses to the main sewers, 254 miles; and the length of main sewers constructed within the twenty years preceding 1841—40 miles. Between July 1830 and December 1837, there were constructed of the above, 12½ miles; and from January 1838 to December 1840, the length of main covered sewers constructed was 10¾ miles. According to a report by Messrs. Walker, Cubitt, and Brunel, which appeared in the *Times*, November 1848, there were then, within the city of London alone, 47¾ miles of sewerage. At present, no less than 141 sewers enter the Thames between Battersea and London Bridge. The whole of the London districts are now under the management of a Central Board.

\* There is, however, another version of Dr. S. Smith's statement, differing very essentially from the above (which is quoted from *Knight's London*: vol. 1 p. 231). In introducing the Health of Towns Bill, Lord Carlisle attributed the following expressions to Dr. Smith. “The districts in which fever prevails are as familiar to the Physicians of the Fever Hospital as their own names.† In every district in which fever prevails extensively there is, uniformly, bad sewerage, a bad supply of water, a bad supply of scavengers, and a constant accumulation of filth; and I have observed this to be so uniformly and generally the case, that I have been accustomed to express the fact in this way:—if you trace down the fever districts on a map, and then compare that map with the map of the Commissioners of Sewers, you will find that, wherever the Commissioners of Sewers have not been, there fever is prevalent; wherever they have been, there fever is comparatively absent.” The intended purport of the two statements was doubtless identical; but, to most comprehensions, their wording (as reported) must render them quite irreconcilable.

† In his Report for 1850-51, Mr. Simon, the City Officer of Health, observed that the local predilections of Cholera are marked and obstinate,—they are not identical with those of fever. Many of the worst fever-nests were unaffected by it, while it visited spacious and airy houses along the main thoroughfare of the city and inhabited by opulent tradesmen, members of the profession, and officers of Assurance Companies, as along the lines of Fleet Street, Ludgate Hill, Farringdon Street, and New Bridge Street. The conditions of its local preference seem to be these—“A peculiar condition of soil, of which dampness is one sure and invariable character, and or-



loch\* declares that wherever the sewage is imperfect, (that is deficient) in certain low neighbourhoods, such as Wapping, Stepney, Bethnal Green, Bermondsey, Westminster, &c., "malignant fevers and other epidemic diseases make fearful ravages among the lower classes;"—and this, indeed, is the general observation. The proverbial danger, then, of the Sicilian Straits is more than realised for those who shall attempt to exist either in the drained or in the undrained districts of the great Metropolis. It is evident, however, that each of the above observations is accurate and reconcilable with the other.—In the one case, we have all the necessary ill effects of want of drainage, in the other we distinguish the consequences of employing sewers and house-drains constructed upon erroneous principles. Until recently, there has existed a plausible notion that the sewers of a large town can scarcely be too capacious.† At present, therefore, the dark streams of London drainage glide tardily‡ through wide

ganic decomposition (promoted by dampness), probably another. Its local affinities have much analogy to those of ague, and often appear identical in their range with the sphere of malarious infection."—"These conditions are exactly supplied by Farringdon and New Bridge Street, the line of the Old Bourne or River Fleet, now converted into a great sewer, and by the districts on the other side of London Wall, from Bishopsgate to Aldersgate,—a district described by Stow as "moorish rotten ground, impassable but for caws-waies purposely made to that intent."—A "fenne or moore made maine and hard ground by divers sluices."

\* *London*; 1851.

† Dion Cassius states that, when Agrippa repaired the sewers of Rome, he turned seven rivers into them, so that he was himself enabled to traverse them in a boat. During the time of the republic, the censors on one occasion entered into a contract to pay 1,000 talents, nearly £200,000, for the repair of the sewers. The chief of these passages—the "Cloaca Maxima,"—which was constructed by Tarquinius Priscus, has (according to Mr. Rich) a semicircular arch, 14 feet in width and 32 in height, formed of blocks of hewn stone joined together without cement. The water-courses of Jerusalem must, latterly, have been upon a similarly gigantic scale. Josephus mentions that when the city was taken by the Romans, two thousand dead were discovered in the aqueducts and sewers, and that many were dragged thence living, only to encounter a more speedy destruction. According to Messrs. Pratt and Saunders, the great Fleet Sewer varies from 6 feet 6 inches high, by 6 feet 6 inches in width at its upper or northern portion, to 18 feet by 12 feet which are its dimensions at its mouth. The sewer from Holborn Bars to Holborn Bridge, is 5½ feet high, and 4½ feet in width. The smaller public sewers are from 4½ feet high by 2½ feet wide, to 5½ feet high and 3 feet in width, the average size being 4½ feet by 2½ feet. It is well known that there are certain unfortunates who make it their occupation to traverse the London sewers, for miles, in search of missing articles or in quest of rats, and that one, at least, of these men has perished among the hideous intricacies of that loathsome maze. The great sewers of New York have been recently described as "arched canals of hard brick from 3 to 9 feet in diameter, and laid in mortar in the most durable manner."

‡ The ordinary movement of the current in Fleet Sewer is stated by the authorities above cited to be at the rate of three miles an hour.



and lofty passages, the reservoirs of poisonous vapours which there stagnate and concentrate until the weight or heat of the atmosphere, the rising of the river, the opening of the abysses for repair, or the sudden rending of the masonry caused by their own accumulation and expansive force, gives them to the outward air as the specific causes of pestilential disease.

It has now been clearly demonstrated that the sewage of towns is best effected by the employment of pipes of comparatively small calibre. The following facts, demonstrative of this principle, are of so much practical value that we may be excused for quoting them in extenso.\*

"In some of the old" (Metropolitan) "sewage districts, small courts, containing only six houses, are drained by vaulted conduits no less than 4 feet high by  $2\frac{1}{2}$  feet wide; whilst recent experiments have shewn that a little pipe, 4 inches in diameter, amply suffices to carry off the sewage of such a place. Nay, in a trial-work superintended by Mr. Morris, under the direction of the late Metropolitan Sewer Commission, 150 houses were found to be perfectly well drained by a single earthenware pipe 6 inches in diameter. Some comparative trial-works, devised for the elucidation of the same point, and conducted by Messrs. Hall and Lovick, under the direction of the same Commission, were still more strikingly conclusive.

\* Mr. Hall experimented on a sewer in Upper George Street, Edgeware Road, measuring  $5\frac{1}{2}$  feet high by  $3\frac{1}{2}$  feet wide, and receiving by several tributary conduits the whole drainage of about 44 acres. This great vein Mr. Hall proceeded to tie, as Majendie would tie a rabbit's. For this purpose, he chose a point, only 560 feet above the mouth of the conduit; and where, consequently, its current was swollen by collateral streams from the whole area drained. Here he built a brick wall across the sewer, having only a hole, 1 foot in diameter, for the passage of the stream. From this hole, a pipe, 1 foot in diameter, was carried to the outlet; a distance, as we have said, of 560 feet. This portion, therefore, of the old vein was virtually replaced by a new one, of less than a twentieth the former size, and about as big as an ordinary arterial water-main. The results of this experiment were capital and very curious. The original sewer had—like all its monstrous tribe—been wont to accumulate deposits, which were only partially kept under by incessant flushing. But, in this

\* From an excellent article in the *Quarterly Review* for March, 1851.



twelve-inch pipe, no deposit whatever took place; a result attributable, of course, to the increased velocity of its closer pent stream. This, indeed, ran  $4\frac{1}{2}$  times faster in the little conduit than in the large one; so that broken stones of several ounces weight each, when put in at the top of the pipe, were heard rattling along it and speedily issued at the other end. Nay, when the pipe was flowing about half full, two brick bats, weighing  $1\frac{3}{4}$  lbs each, were carried through its whole length, and emitted with such force from its mouth, as to strike the man who was watching for them, a blow on the legs which he declared to be painful. And a live rat, put in on the same occasion, came out at the lower end in so headlong a fashion as proved him to have lost all control over his own motion. \* \* \* \* \*

"Such tubes, we learn from the engineering estimate before us, may be laid down for less than a fifth the cost of ordinary brick sewers built on the old 'Roman grandeur' principle. Nay, the mere cost of flushing these latter amounts, in many districts, to £29 per mile per annum; whilst the total construction-cost of the self-flushing tubular sewers, if distributed over 20 years, would barely amount to £20 per mile per annum. Even in the comparatively well-managed Holborn and Finsbury District, the flushing-costs amount to £17-5s. per mile per annum; so that, striking a fair average between the higher and the lower figure, we may venture broadly to assert that London might be drained (de novo) on the tubular, or physiological system, not only without laying fresh rates on the inhabitants, but with direct and immediate diminution of existing charges." Indeed, it is proved further on that, in the saving of water-supply, of steam power, and of the labour of horses and men, the introduction of a thorough system of improved drainage would, paradoxical as the assertion may seem, prove decidedly cheaper than the system which now prevails where there is no drainage at all.

It is further shewn that the diameter of house-drains may be similarly reduced with equal advantage. "Your ordinary house-drain," remarks the writer of the above article, "is very commonly a foot in diameter, and large enough, therefore, to carry off the sewage of 44 acres, according to Mr. Hall's experiments; or of 1,200 houses, according to Mr. Lovick's results. The minimum size of house-drains permitted by the Building Act is 9 inches diameter; and the collective sectional area of these private drains in London equals, on a low estimate, five-fold the sectional area of the Thames at



Waterloo Bridge during high-water. To keep these capillaries full and flowing would take a river above 1,000 feet wide by 100 feet deep, running at the rate of 2 miles per hour; whereas the actual water supply of the Metropolis, all that really passes through them, would scarcely keep a brook 9 feet wide by 3 deep flowing at the same rate. The consequence is that our house-drains, lacking water to scour them, get choked with a pitchy coagulum—like the stagnant blood in a cholera patient's veins."

We are further told that, "the seventeen million cubic feet of decaying residuum, now lying a subterranean chaos under London, debilitate us all without exception, and injure rich and poor more equally than is commonly supposed. It appears, indeed, from that most appalling revelation, the Report of the late Subterranean Survey, that Belgrave and Eaton Squares, as well as the whole splendid neighbourhood of Hyde Park Gardens, stand over sewers abounding in the foulest deposit, in many cases stopping up the house-drains, and emitting the most disgusting effluvium; and that the more ancient sewers of Cavendish, Bryanstone, Manchester, and Portman Squares, are in such a state of rottenness and decay that there is no security for their standing from day to day; and that even the attempt to evacuate them by flushing, might bring some of them down altogether; while, curious to tell, the only little spot in the whole Westminster District, of which the sewers are at all in a satisfactory condition is *Seven Dials!*"

Then come distinct and encouraging answers to the all-important questions:—"Will these 4-inch tubular house-drains really work? are they not liable to stoppages? are they not too small to carry off the water of occasional storms, in addition to the ordinary house-drainage? To all these very fair and pertinent questions let facts afford their equally fair and pertinent reply. In 1848, Mr. Grant, the Surveyor, drained five houses through one 4-inch pipe which has worked perfectly, without stoppages, ever since. Some months afterwards, he laid down similar drains for a number of houses at Exeter; and notably for one block of 130 houses; which have all acted well, notwithstanding a comparatively scanty supply of water. In 1849, Mr. Morris, the Surveyor of Poplar, drained several courts with 4-inch tubes, each carrying away the refuse of six houses; and these drains, like Mr. Grant's, have since worked, and are still working, perfectly well. In the same year, an outbreak of epidemic fever in the cloisters of Westminster Abbey, induced the Dean and



Chapter to consent to a similar subterranean revolution in that heretofore stinking quarter. On opening the ground, a hideous sight was disclosed. A series of cess-pools, barrel-drains and brick-sewers were found, so large and so crammed with stagnant filth that no less than 500 loads were taken from a single portion of the net-work serving only 15 houses! The sewer, at one part, measured 7 feet wide, at another part 17 feet high! Under the Westminster School, the soil stood 9 feet deep: a pleasant reflection for parents who have had sons paling over their books, day after day, amidst the fumes of that pestiferous gulf. The area of the 15 houses, the school, and the chapter-house, &c., with the connected grounds, was about two acres; the evaporating surface of subterranean filth was 4,800 square feet—or about  $5\frac{1}{2}$  per cent. of the whole area. This mass of abomination was at once swept away by Messrs. Auster and Lovick, who replaced the old stagnant drains and cess-pools with 3,000 feet of tubular mains and capillaries, measuring respectively 9, 6, and 4 inches in diameter. These drains work perfectly; the immemorial stench has ceased; and the inhabitants have ever since enjoyed an unaccustomed exception from sickness. The Dean of Westminster, in a letter to the Commissioners, says:—‘I beg to report that the success of the entire new pipe drainage laid down in St. Peter’s College has, during the last twelve months, been complete. The Clerk of the Works has examined every closet once a week, and entered his written report in a book laid every Wednesday before the Dean and Chapter; and not one case of failure or imperfect working has occurred.’

“As for the discharge of storm-water through these 3 and 4-inch house-drains, this much-vexed question was experimentally determined by Mr. Medworth, acting under the directions of the late Metropolitan Commissioners of Sewers. Mr. Medworth ascertained that a 4-inch drain-pipe, 50 feet long, laid with a fall of 1 in 120 (or 5 inches higher at its upper than at its lower end) discharged 100 gallons of water (equal to 24 hours’ supply of sewage from a house) in one minute and a half. One-sixteenth of sand, mixed with the water, was freely discharged by the sweep of the current. As the heaviest rain-fall known in England does not deliver more than one gallon on each square foot per hour, such a pipe would discharge the storm-water of 4,000 square feet. And even this abundant discharge was more than doubled by increasing the declivity of the pipe to 1 in 60. As for the velocity of the current in these pipes, its rate was found



to be four miles an hour, even with so slight a fall as 1 in 240: so that refuse, thus discharged at any given moment from the post office, would, within 45 minutes, be already beyond the three miles' radius; and, within 2 hours, be far beyond the utmost limits of the Metropolis."\*

The adoption of this system of drainage involves that extremely important desideratum in the sanitary regeneration of towns,—the abolition of cess-pools, "those receptacles of sediment and filth in which are bred the deadliest of the poisons which taint the earth we tread on, the water we drink, and the air we breathe."†

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\* The practicability of conveying vast quantities of fluid rapidly through pipes of slender calibre, was so long ago demonstrated and acted upon, that it is surprising the principle should not have been earlier adapted to the purposes of sewage. Mr. Stephens describes the celebrated "Fish-Pools of Solomon" as three reservoirs about 480, 600, and 660 feet in length and 280 in breadth, and of different altitudes; the water from the first running into the second, and from the second into the third. The water is thence conveyed to Jerusalem (a distance of six miles) by a small aqueduct, a round earthen pipe about ten inches in diameter which is sometimes above, and sometimes under the surface. "There is no new thing under the sun."

The leaden pipes of the aqueduct of Mont Pila, discovered in the Rhone, were nine in number, each being eight inches in diameter. Edinburgh now receives the large portion of its water supply (at the rate of from 180 to 200 cubic feet per minute) through a line of iron pipes varying from 20 inches, near the reservoirs, to 15 inches towards their termination.

† These "barbarous things" assuredly constitute the direst evil in the physical condition of our Towns. It is stated in the "Essay on the Sanitary Movement" already referred to, that, from a calculation made on the basis of the census (1841), there are, in London 300,000 cess-pools, the contents of which (forming an exhaling surface of 2,700,000 feet, —nearly 62 acres) are 17,550,000 cubic feet. This, in the words of the authority, is "equal to one enormous, elongated, stagnant, cess-pool 10 miles in length, 50 feet in width, and 6 feet 6 inches in depth, which would extend through London, from the Broadway at Hammersmith to Bow Bridge over the River Lea." In many towns the grossly ill-managed disposition of these plague-spots in itself constitutes a vast evil. In one part of Manchester (according to one of the Working Classes Association's Tracts) there are only 33 to a population of 7,000; and one locality is named in Ashton where there are only 2 privies for 50 families. Many parts of the Metropolis are equally badly provided; here we read of "one resort common to 5 houses containing about 150 persons, &c., &c." Scarcely an argument is needed to prove the necessity for removing such deadly nuisances as that described by Mr. Gotto (*Report*: June 15th, 1849; and *Quarterly Review*) as "situated in the back-yard of No. 10, Carrier Street, having its brim 12 inches above the level of the house floor, and covering the yard with its black overflow, which, spreading to the wall, soaks into the adjacent premises;" or that mentioned by Dr. Reid, where, "in one court the whole products of waste cabbage water, &c., from the public kitchen, evaporated from a cess-pool under it, which had not been cleaned for twenty years." It was found that the receptacle "had no communication whatever with any external discharge; and that during the long period mentioned, there was abundant evidence to prove that all the liquid products it had received had no escape, except by evaporation into the atmosphere that supplied the courts above." The required improvements cannot be rejected on the score of



We have, further, a clear exposition of another great and almost universally prevailing evil, the non-retentive character of our present drains. "Though it is essential that these channels should be water and air-tight, they are yet built of bricks, so porous that each will absorb about a pint of water; and so small that a thousand of them, with a thousand chinks between, go to the making of an ordinary house-drain. The chinks no doubt are stopped, but in a rude fashion; and with so soft a mortar as readily gives way (like the bricks themselves) before the teeth of the rats. Hence fluid leakage into the soil beneath, and gaseous exhalation into the air above; pernicious damp dilapidating the foundations of the houses; and poisonous miasmata undermining the health of its inmates. Beside evils of such magnitude as these, it may seem almost puerile to notice the annoyance of the pilfering rodentia admitted through these sieve-like drains into our larders; yet this is no light evil in the aggregate. It is computed that the wholesome food which the rats of London consume or spoil, would suffice for the nourishment of several thousand men. Their multitude is, at once, the measure and the reproof, of the foulness of our social organism, which is infested by these vermin, as the unclean individual is by other parasitic swarms—equally nimble and equally loathsome."

The importance of providing that every sewer shall receive an abundant and uninterrupted supply of fresh water, must next engage our attention for a few moments. The powerfully antiseptic influence of pure running water, and its property of condensing and absorbing offensive and poisonous gases are familiar to every one. It is only by securing an abundant supply of this element that even the "physiological system" of sewage can be rendered absolutely free from the evils of deposit and exhalation. We have seen that the Romans appear to have been perfectly acquainted with this principle; and that the supply of water to their sewers was profusely abundant; even now, the *cloaca maxima* forms the channel by which the stream of one of the ancient aqueducts rushes to the Tiber. It has been already men-

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expense. It is stated, in the Tracts cited above, that the pans may be found complete and be fixed and connected with a drain, on any old tenement, for £1,—a moderate extra sum being charged for laying on the pipe. The Nottingham Water Company "are glad to put water-closets in the houses of tenants at a rental above £100, on the payment of ten shillings per year." It can scarcely for an instant be doubted that in the course of another year or two every landlord will be bound, under a weighty penalty, to take this step for the improvement of the sanitary condition of his houses.



tioned that more than one of the London sewers follow the tracks of ancient water-courses; but, until lately, a very large proportion of the Metropolitan sewers depended wholly upon scanty and insufficient supplies of rain and waste water for their purification. A few years since, however, Mr. Roe, the Surveyor, introduced the system of scouring or flushing the sewers. At the first employment of this plan, its operations were described as follows:—"The water used for forming a head is contracted for with the water-companies, and amounts to about 20,000 hogsheads yearly. When a sewer is to be cleansed, the water is backed up, and, when let off, cleanses the sewer to an extent proportionate to the quantity of head-water, the fall of the sewer, and the depth of the deposit." By providing heads of water at suitable distances from each other, and "flushing periodically, perhaps three or four times a year, the deposit of sediment," (here spoken of as averaging  $1\frac{1}{2}$  inch yearly) "might be prevented from accumulating at all." This system, which has since undergone several improvements, is certainly the only one that can secure even an approach to cleanliness in sewers constructed upon the old principle; but it does not appear to be very extensively practised in London. Probably the deficiency and *expense* of water, the insecurity of many of the sewers, and the danger attending the sudden forcing out of pestilential gases through the valveless orifices of the gutters and drains while the flushing is going on, especially during the summer months, have been found the principal drawbacks. We have already seen that it was not until the Pestilence of 1849 was upon the decline in London that the Commissioners began to question whether it would be safer to flush their sewers, or to leave them as they were!

It is certain that the necessity for irrigation with pure water is greatest where the large sewers are retained;\* but, even under the new system, all available pure water, from rain, from landward streams, and from the surplus supply of the Town, should be carefully distributed throughout the entire system of sewer-pipes.

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\* "The finest formed sewer," says Capt. Vetch R.E., "and the best arrangement of them, would be of no use without an adequate supply of water. The drains but furnish the ways or vehicles for transportation; the water is the moving power or carrier, and it is the cheapest that can be procured. In fact, the supply of water to a town and the discharge of the refuse, are two branches of the same subject, and unless the water be abundant enough, and distributed enough, to cleanse the drains, these last would be more offensive than useful."



It will be perceived, then, from the foregoing facts, that there is little difference, as regards insalubrity, between those parts of a city which stand upon a vast network of capacious, uncleansed, and leaky, sewers; and those districts of its environs which are everywhere intersected by stagnant, open, drains. Indeed, it is probable that, from their greater concentration, the sewer vapours are far more poisonous than are the more diffused exhalations of the drains.

The opinion that the only proper outlet for the sewage of a large town is a rapid river or the sea is one which certainly agrees ill with the utilitarian spirit of the times. Still, the sanitary reformer who places the value of life before that of property will unhesitatingly adhere to this view, until it can be shewn that the vast excreta of a city like London can be applied to agricultural and chemical uses, not only with pecuniary profit, but also, to say the least, with that degree of safety which attends paper-making, tallow-melting, soap-boiling, or any other of those occupations which, although far from agreeable, have nothing essentially deadly in their tendencies.

It is difficult to estimate, with exactitude, the real average amount of putrescent fluid which is daily poured from the 209 sewers that open between Richmond and London Bridge. In a report printed by the Court of Sewers for Westminster and Middlesex in 1845, it was stated that the amount of sewage daily poured into the Thames, from the North side of London, was 7,045,120 cubic feet, and from the South side 2,457,600 cubic feet; giving a total of 9,502,720 cubic feet, equivalent to a surface more than 36 acres in extent, and six feet in depth. At present, the Commissioners put down the quantity discharged from the northern side of London as 120,000 tons daily, or 43,800,000 tons per annum. In 1847, it was estimated that 100,000,000 tons of drainage water, suspending from 1,250,000 to 1,500,000 tons of solid refuse, were annually poured from the sewers into the river. When it is understood, then, that the whole of this material is acknowledged by the best agricultural authorities to be in a remarkable degree adapted for manure, and that it moreover contains chemical substances of great value, it is not surprising that a good many deep reasoners should unite with the ardent speculators of the day in exclaiming against the waste of the almost inestimable flood of treasure which the Thames and very many others of the English streams roll daily to the sea. The Metropolitan Working Classes Association reckon the annual loss in England and Wales at



£10,000,000; but this is a very moderate estimate: according to some calculations, the amount yearly sacrificed in this way throughout the United Kingdom would considerably exceed that of the Government Revenue! Not very long since, Mr. Haywood, a professional chemist, and Mr. Lee, a civil engineer, declared that the produce of the excreta of the 110,000 inhabitants is annually equivalent to,—

	Pounds.	Tons.
Potash and Soda, ..	1,193,500 or about	537
Lime and Magnesia, ..	818,400 „ „	365
Phosphoric Acid, ..	1,173,700 „ „	524
Nitrogen (?) ..	1,683,800 „ „	751

They estimated the refuse as equal in value to 3,140 tons of Peruvian Guano, or £30,000. The Phosphoric Acid alone is worth £10,000. The remaining ingredients, it was asserted would keep no less than 100,000 acres of land in a constant state of fertility? The Health of London Association estimate the annual worth of the sewage of London, which is now suffered to run to waste and pollute the Thames, at £433,879. The quantity of Guano annually imported into the United Kingdom is officially returned as from eighty to a hundred and twenty thousand tons; and the love of trade scarcely glows more warmly than does the love of saving in the commercial heart of England.

To allow of a fair judgment, it will be right to cite a few of the more reasonable of the views which have been advanced upon this vitally important question.

In 1845, an eminent London Surgeon, who had, of late, devoted much of his attention to the practical application of agricultural chemistry, published a pamphlet\* in which attention was very ably and practically drawn to the disinfecting power of aerated water. The most offensive compound met with in decomposing "Cloacine" is well known to be hydro-sulphuret of ammonia; the author found that, if this compound be exposed to aerated water, and the vessel frequently agitated, it sooner or later undergoes a chemical change. The water loses its offensive smell, and a mixed compound of sulphate and hydro-sulphite

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\* "*Guano Streams*; an Attempt to suggest a Method of Preserving the Refuse of the drains of Towns for the Purpose of Manure; in a Letter to his Grace the Duke of Buccleugh, K. G., Chairman of the Committee appointed by Government to enquire into the Sanitary state of Large Towns."



of ammonia results, the latter being the transition stage of the hydro-sulphite to sulphate. Hence, the author advocated the principle of bringing the refuse, or cloacine, into contact with the free oxygen contained in aerated water (this element, according to Dalton, containing 100 cubic inches of air in 5,000 cubic inches). "Every one," observes the author, "must have observed black offensive streams issuing from drains, and mingling with the pure water of a small current. At first, the rapidity of the current may prevent the condition of the mingled streams being closely examined; but soon the stream expands, and then flowing more gently, the water appears as a dark lake, depositing its dark mud in its bed. Slowly flowing along, it is seen to become more and more pure, until, having deposited the whole of its suspended materials, it appears as a clear stream, as free from the impurities as if nothing had polluted its course. The water that conveys such refuse seems to the eye unfit for any purpose save that of manure; the black bed of the stream gives it a dark colour, and the whole mass of water looks like a black unwholesome lake; but, if some of the water be taken from the stream at some distance from the drain, after it has had time and space to deposit its freight, it is clear to the eye, and free from any unpleasant odour. If the stream becomes narrow as it passes onward, it sometimes will appear like a clear pellucid current, fit for any of the ordinary purposes of life." The author then went on to propose that, instead of allowing the sewage of London to pollute the Thames, it should be conveyed, in contact with an abundance of aerated water, throughout a long channel at a sufficient depth to prevent the exhalation of foul effluvia; and then, after it should have deposited the animal matters, acidified by contact with oxygen, and forming salts by combination with bases in the bed of the stream, to convey the residuary clear water into the river, or some other outlet. It was further argued that the supply of waste water for this purpose, as regards the Metropolis, was ample, and that it only required the ingenuity of some experienced engineer to contrive a sufficient length of underground channel to bring the principle into operation.\*

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\* It almost appeared to be a prescience of his own approaching fate which led this great practical surgeon to devote his last researches to sanitary measures. He fell among the victims of that fearful first week of September 1849. His project is nearly identical with that now contemplated by the London Commissioners.



Dr. Guy has followed in the same track ; he observes,\* "If, after removing the lighter substances which float on the surface" (of the drainage fluid) "the heavier matters held in suspension are allowed to subside, which they do in the space of four or five hours, the supernatant liquid, though still containing the most valuable elements of plants, will be nearly as clear as the waters of the Thames, and will admit of being dealt with as if it were common water. Now we all know, from the experience of water companies, how easily and economically large quantities of water can be transmitted to great distances by machinery, and it is quite obvious that sewer-water admits of being so conveyed. If this plan were adopted, it is laid down by high authority that, while the cost of cartage would amount, under the most favorable circumstances, to 4s. per ton, the cost of conveyance by machinery would be only 2½d. a ton. According to another high authority, while the distribution in the solid form costs about £3 that in the liquid form costs only 6s. It has also been experimentally proved that the sewer-water admits not merely of being conveyed to the land thus economically, but that it can be easily and cheaply distributed over the land by means of a hose ;—a plan originally suggested by Mr. John Martin, put to the test of experiment by Mr. Smith of Deanstone, and now, as I understand, in actual use on a large farm in the neighbourhood of Glasgow." It would be too great a stretch of prejudice to declare that the sewage of great cities can never be applied to profitable use. It is certain, however, that our sanitary legislators have always found it very difficult to overcome their doubt regarding the safety of thus creating a "*mare mortuum*" on either side of the Metropolis. Let us trust that no proscribed district of fertile Essex, or of the "Garden of England," or of thickly-peopled Surrey, will ever be permanently impested by the blasting exhalations of these gigantic sinks.† It is still beyond the science even of a Liebig or

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\* *On the Health of Towns, &c.* A Lecture delivered at the Russell Institution : May 5, 1846. (London 1846.)

† A serious attempt to introduce an improvement of this kind was made, but, happily, in part frustrated in 1846, when a Bill was laid before Parliament with a view to empower "The Metropolitan Sewage Manure Company" to convey the contents of the London sewers to the neighbourhood of Hounslow, there to be collected in tanks and other "conveniences," and then to be employed in fertilising the surrounding country. The wisdom of our Legislature mercifully saved Hounslow from this mortal visitation ; but a Company under this title is still in active, but, judging by their reports, in somewhat embarrassed operation.



a Boassingault to demonstrate a sure and economical means of neutralizing the poisonous qualities of an almost immeasurable quantity of city excreta; and to lay down precautions by which such operations may be carried on even with that degree of safety which attends the working of the Quicksilver Mines at Carniola.\* The solution of the problem—in what manner ten thousand pounds worth of Phosphoric Acid, or thirty thousand pounds worth of Guano may be procured from the excreta of a given city, at a remunerative rate, and without occasioning an obviously increased mortality, either among the workmen engaged in the manufacture or among the inhabitants of the surrounding district—appears to be awaiting the decision of that great synthetical chemist with whom Gulliver made acquaintance in the college at Laputa.†

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\* A pamphlet on this subject,—entitled “Observations on the Nature, Properties, and Value of the Patent Solid Sewage Manure; with a description of Wicksteed’s Patent Process for its Manufacture, &c. London: Weale, 1851”—however deserves attentive perusal.

† In December 1847, a foreigner named Poitevin, described as a “patent highly concentrated manure manufacturer,” was charged at Worship Street, with having suffered a large quantity of offensive and noxious matter to accumulate upon his premises to the serious impairment of public health. The prisoner was stated to have three sheds, each about 50 or 60 feet in length, and of proportionate width. Two of these were open to the atmosphere at the sides. They were each filled, to the depth of four or five feet, with a mass of compounded matter, of the consistency of earth, to the extent of several hundred tons, and apparently composed of blood, night-soil, and other animal substances, and exhaling such an offensive odour that it was perfectly overpowering. One of the district surgeons deposed that scarcely 100 feet intervened between this manufactory and the Spitalfields Work-house, which was at that time crowded with inmates amongst whom febrile and other affections considerably prevailed, and he had every reason to believe that these were greatly induced by the contiguity of the manufactory, as, whenever the wind blew from those premises it carried an odour in the last degree offensive and calculated to produce the most pernicious consequences. On such occasions, whatever diseases happened to prevail in the Work-house exhibited a great tendency to putrescence, and assumed a most malignant and intractable character. The house also contained nearly four hundred children, who were more susceptible than adults to the effects of an impure state of the atmosphere; and, amongst these, there had lately broken out no less than twelve cases of spontaneous gangrene, a disease which but rarely existed unless the atmosphere was very impure, and the whole of these cases had terminated fatally. He had likewise found that, whenever the effluvium became powerful, the adult portion of the inmates were invariably attacked with diarrhoea of the worst form; and, as this immediately subsided on the wind changing, he felt satisfied that the nuisance in question was the cause of the illness. Another Union surgeon confirmed the evidence of the last witness, and added that, after his own visit of inspection to the defendant’s premises, he was seized with a violent sickness, which lasted three quarters of an hour, and was so seriously ill for three or four days subsequently, that he was obliged to place himself under the care of another surgeon. The odour from the defendant’s manure so permeated the atmosphere that he had



It was reported in 1850, that the Sewers Commission were about to commence the drainage of the great Southern suburb of London with a determination that, from Vauxhall to Deptford, no sewer should discharge its contents into the Thames. It was intended that one great sewer was to enter the river below Deptford, being so constructed that it should flow only at the full of the tide. The report also stated that 58 miles of sewer had been surveyed and levelled on the North side; that 100 miles more then remained to be done; that the survey map would contain 900 sheets, 270 of which were already engraved, and all the rest in hand, besides 44 sheets of the reduced map. We have seen that the execution of the great London, Westminster, and Southwark, drainage project is merely delayed for want of funds. It is purposed to convey the 120,000 tons of sewage which daily flow from the Northern side of London, through large conduits, to the mouth of the River Roding, about eight miles from the city. "The sewage will be collected in enormous reservoirs at Barking-creek, to be discharged into the river at such period of the tide as will prevent its return to London, or to be disposed of, if practicable, for sewage manure, and thus converted into a source of revenue." The Commissioners add that "there is little doubt of the partial success, at any rate, of the last proposition, as offers have already been made to the Commissioners to lease from them certain sewage outlets, with the view of using the soil for agricultural purposes."\*

The good legal principle, *sic utere tuo ut alienum non lædas*, has become almost painfully hacknied in the mouths of sanitary reformers; still, where questions of public health and of public or private property are daily coming into antagonism, it must ever be present in the minds, and foremost in the counsels, of those who advocate *The Right*. This question becomes a difficult one where, as in the case alluded to above, it is proposed to incur a certain amount of risk for the purpose of obtaining pecuniary aid in carrying out a really beneficial object which is stationary from want of funds. Still, that is unworthy to be termed a system of Sanitary Reform which, when undertaken by an intelligent and toler-

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frequently smelt it at a distance of three quarters of a mile, and considered, it highly dangerous and destructive to the health of the whole neighbourhood. This may be taken as one among the multitude of evils which formed the antecedents of the late cholera pestilence in London. Mr. Poitevin's deadly nuisance was brought to light and swept away just as it was announced that the epidemic had entered Galicia en route to the city of Ill Savours.

\* Report of 1851.



ably wealthy people, sanctions—on the score of “economy”—measures which evidently imperil the health and the lives of men.

It is unnecessary, in the present day, to call over the multitudinous roll of recorded facts illustrative of the fatal effects which deficient and faulty drainage, alone, or combined (as it usually is) with ill ventilation, exercises upon the health of individuals and of congregated human beings. The Parliamentary reports and public prints abound with instances of men struck down with deadly fever at the mouths of open drains;\* and of extensive city districts permanently impested by fevers generated in their accumulated refuse. In like manner, the records of our hospitals teem with examples of uncontrollable erysipelas and sphacelas attacking the wounded; of destructive intestinal complaints, which are not the natural scourges of temperate regions; and of that cruellest of all maladies,—puerperal fever, each and every one of them demonstrably resulting from the presence in the air of gaseous poisons generated in cess-pools, gutters, sewers, and other foci of animal and vegetable decomposition. Nay, a few glances at the pages of history afford us instances of entire nations sickening and wasting under the persistent influence of like causes.

A few facts illustrative of the effects of improved drainage and ventilation in increasing the value of human life may, however, be cited with advantage. Mr. Holland has given the following return of the deaths occurring at Chorlton-upon-Medlock, upon an average of the five years preceding 1843:†

House of 1st class—1 in 52.	} Rate of mortality.
„ 2nd class—1 in 40.	
„ 3rd class—1 in 29.	

This gentleman states that in the above town, the mortality fell from 110 to 89 per annum after, and, no doubt, principally in consequence of, the streets being properly paved and drained. Mr. Gardiner and Mr. Noble have confirmed this result, by shewing that, in certain streets in St. George's district, Manchester, the deaths in 1838-39 amounted to 495; but that in 1841-42, after the streets were paved and sewered, the deaths were only 432, being a diminution of 62, or about

\* Dr. Wigan, author of an ingenious work on “The Duality of the Mind” died from this cause; the deaths of Dr. Jordan Roach Lynch, and of the great and estimable physician Dr. James Johnson, are accounted for in a nearly similar manner.

† *Health of Towns Commission Report*:—vol. i. p. 207.



one-eighth. In a district in Ancoats a diminution of 40 deaths out of 270, or about one-seventh, followed a similar improvement.\* The Revd. Professor Buckland has stated that, in the parish of St. Margaret, Leicester, containing 22,000 inhabitants, the drainage appeared in one part to be effectual; in some parts, but partially so; while, in others, there was no drainage at all. In the latter, the average duration of life was  $13\frac{1}{2}$  years, while, in the same parish, where the drainage is only partial, the average is  $22\frac{1}{2}$  years.† A very striking example of this kind has also been given by Mr. Crowfoot, Surgeon at Beccles. This gentleman mentions that the two towns of Beccles and Bungay are nearly alike as to natural advantages of situation, &c; except that Bungay, having a larger proportion of rural population, inhabiting the district called Bungay Uplands, ought to be more healthy than Beccles which has nearly its whole population confined to the town. About thirty years since, Beccles began a system of drainage, which has since been rendered as complete as possible. Bungay, on the contrary, remains filthy and ill-drained. The comparative mortality has been as follows :—

	Beccles	Bungay.
Between the years 1811 and 1821 ..	1 in 67	—1 in 69.
„ „ 1821 „ 1831 ..	1 „ 72	—1 „ 67.
„ „ 1831 „ 1841 ..	1 „ 71	—1 „ 59.‡

#### VI. *The abundant Supply of Pure Water to Towns.*

Wherever neither prejudice nor class interests obtain the ascendancy, it will be apparent to every one, not only that a river which receives the entire drainage of a vast city cannot afford a wholesome supply of drinking water for the inhabitants, but also that, even if the contents of the sewers and drains be diverted to another outlet, the main water supply of the city ought not to be derived, immediately, from its intersecting river.

A densely-built and thickly-populated city should receive its main supply of water only by aqueducts, from pure and abundant sources in the surrounding rural districts.

It is self-evident that squalid uncleanness, and consequent insalubrity, must prevail nearly to an extreme degree in any city which does not provide an abundant supply of

\* *Guy's Lecture on the Health of Towns* : 1846.

† *Chambers' Journal* : June 1844.

‡ *Sanitary Economy* : p. 141.



pure water, either free of expense or at the lowest attainable rate, for the use of its poorer inhabitants.

When a North American Indian is debating upon the selection of his winter-quarters, his first measure is to ascertain the purity of the springs which lie in the vicinity of its proposed site. The phrase by which the Bengallee characterises an unhealthy locality has no reference to the soil, or to the air, it is merely,—“The water is bad.” In this respect the refined and scientific Englishman shews much less caution and discrimination than is displayed by his ruder brethren. He has a keen appreciation of the value of “water-power;” he guards scrupulously his rights of “water-way;” he appears to derive no small satisfaction from occasional quotation of the established distich that “Britannia rules the waves;” but he is, upon the whole, by no means liberal or fastidious in securing his “*Water-Supply*.” The limpid element in its undiluted form, is, unfortunately, not his favorite liquid; and, therefore, few of his towns can boast of even moderate advantages as regards an abundant influx of the great purifier.

There still exist numerous archæological evidences of the fact, that the ancient inhabitants of Egypt, Hindustan, Persia, Judea, Mexico, and Greece, devoted enormous labour to the task of supplying their cities with abundant streams of the purest water; but in this respect, Imperial Rome surpassed, beyond comparison, all the cities of ancient or modern times. Through rocky tunnels; along channels of indestructible masonry raised tier above tier; upon arches from sixty to a hundred feet in height, striding across ravines, chasms, wide and rapid rivers, the Great Campagna and the Pontine levels, then reclaimed and waving with golden harvests—three hundred million gallons of the waters of the Appennines, of Tivoli, of Tusculum, daily gushed into the reservoirs, baths, and fountains of the Capital of the World. Hers were—

———“those musically falling founts,  
To slake the clammy lip; adown they fall,  
Musical ever; while from yon blue hills,  
Dim in the clouds, the radiant aqueducts  
Turn their innumerable arches o'er  
The spacious deserts, brightening in the sun,  
Proud and more proud in their august approach.  
High o'er irriguous vales and woods and towns,  
Glide the soft whispering waters in the wind,  
And here united from their silver streams



Among the figur'd rocks, in murmuring falls,  
Musical ever.\*

Even if Lipsius has recorded truly that, in the height of Rome's prosperity, its population was at least four millions, the pure unused waste water of the city must have brightened and refreshed even the waters of yellow Tiber in their out-flowing.†

A brief sketch of the history of the water supply of the English Metropolis, past and present, and of the various plans for its improvement which are now under discussion, will afford a practical insight into a large proportion of the desiderata and evitanda which must regulate this vitally important element in the sanitary condition of cities. Until the commencement of the 13th century, London depended for its water supply mainly upon those "choice fountains of water, sweet and wholesome and clean, streaming forth among the glistening pebble stones" which Fitz-Stephen describes as lying to the north of its suburbs. In the reign of Edward III, the river of Wells (or old-Bourne), the Longbourne, and the Wall-Brook, had suffered so greatly from the increase of the surrounding buildings and from the pollution of the growing city, that by a royal order, and the generosity of Gilbert Sandford, the waters of Tybourne, or Ai-Bourne, were conveyed by leaden pipes of 6-inch bore to the conduit in Chepe, by Bow Church, "for the profit of the city and good of the whole realm thither repairing; to wit, *for the poor to drink*, and the rich to dress their meat."‡ This was, for the period, an engineering work of considerable importance, seeing that the present ornamental lake in Regent's Park is formed by the collected waters of Tybourne. Henceforward, the water supply of London was not increased until 1582, when Peter Morris, a Dutchman, re-

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\* We learn from Frontinus that the entire length of the aqueducts which supplied Rome, A. D. 100, was upwards of 255 miles. That erected by Claudius was about 42 miles in length, and conveyed about ninety-seven millions of gallons daily.

† Indeed they must have more than doubled the contents of the river. The artificial water supply of Rome must have been equal to twice the quantity that is found to pass daily under Richmond Bridge. It would have been sufficient to fill a tank having a surface of seven square miles, and ninety feet in depth. Now that no more than three of these mighty water-ways remain effective, 5,305,000 cubic feet of water are said to enter Rome daily for the use of its 130,000 inhabitants, affording a far ampler and less exclusive supply than is at present attainable by the people of London.

‡ *Stow's Chronicle.*



ceived a lease of two of the arches of London Bridge, and free use of the Thames water for the supply of a portion of the city by powerful water-works. It appears that Morris's "forcier" raised 45,000 hogsheads of water daily, with very extraordinary power; but that the supply was extended only to the houses as far as Grace-Church Street. Subsequently, another hydraulic machine was erected for the supply of Cheapside, the neighbourhood of St. Paul's, and Fleet Street: and, about a century later, a third was raised near York Gate in the Strand. In 1613, when the inhabitants of the Metropolis did not much exceed one hundred and fifty thousand, the illustrious Hugh Middleton succeeded,—despite of the bitterest opposition and ridicule, and at the cost of a noble fortune,—in leading the Hertfordshire waters of Chadwell and Arnwell into London, by an open canal thirty-nine miles in length. Since Middleton received the patent under which the "New River Company" was formed, eight other water-companies have been organised in London. The three ancient river water-works have long since disappeared; but, unfortunately, five of the nine companies still derive their daily supply of twenty millions of gallons from London's gigantic drain. It is difficult to imagine by what process of reasoning the Londoners could have reconciled themselves to Thames water as a beverage;—nay, even have contracted the still popular notion that this unclean compound possesses surpassingly excellent qualities. It is true that the water is, in itself, tolerably good, but it is also certain that, for the last six hundred years at least, the influx of a mighty city's drainage has rendered it unfit for human consumption. From Fitz-Stephen's time (12th century) until Stow wrote his *Chronicle*, we have evidence that the Thames "Above Bridge" was rich in fish, amongst which the lordly salmon even was not wanting. In the reign of Elizabeth, the swans of the city companies sailed in flocks among the shipping, and an ancient usage had devoted any of their number, which should chance to float within the jaws of Traitor's Gate, as a forfeit to the Constable. Still, it cannot be doubted that the Thames had always a turbid flow. We have seen how early the channel of the river of Wells began to convey a stream,—

———"than whom no sluice of mud  
With deeper sable blots the silver flood."

And a curious quotation recently given in *Notes and Queries*, from a sermon preached at Paul's Cross in March



1620, by King, Bishop of London, "on behalfe of Paule's Church," shews that the pollution of the Thames was an evil of ancient notoriety. After expressing his admiration of the various buildings and institutions of London, the preacher exclaims, "I cannot denie them to be excellent workes and your cittie to deserve the name of an augustious and majesticall cittie; to cast into the reckoning those of later edition, the beautifying of your fields without, and pitching your Smithfield within, new gates, new water-works, and the like, which have been consecrated by you to the dayes of his Majestie's happy reigne; *and I hope the cleansing of the River, which is the vena porta of your cittie, will follow in good time.*" The following description of the properties of Thames water is from a work by Sir Jonas Moore, Surveyor of the Ordnance to Charles the II :—

"The Thames water, taken up at Greenwich, at low-water, where it is free from all brackishness, and has in it all the fat and sullage of London, makes a very strong drink. It will itself alone, being carried to sea, ferment wonderfully, and, after its due purgations, and three times stinking (after which it continues sweet), it will be so strong, that several sea commanders have told me it would burn, and has often fuddled their marines. Other commanders have denied this, which I thought I had reason to impute to their want of observation."

Making due allowance for the worthy knight's unacquaintance with the properties of carburetted hydrogen, his description of the potent fluid in question precisely represents the qualities which it still possesses. Even the author of Cooper's Hill was compelled to acknowledge of his favorite river,—

"Though to those streams he no resemblance hold,  
Whose foam is amber, and their gravel gold,  
His genuine and less guilty wealth to explore,  
Search not his channel, but survey his shore."

Some arguments of considerable apparent weight may be alleged in favor of those companies which still draw their supply from the Thames. Thus, the water which they furnish is well-flavoured, and seemingly of considerable purity,—Still, it will not be forgotten that water, clear as crystal, is procurable from the veriest refuse fluid: a familiar example of this fact used to be visible daily in the filter-maker's window near Temple Bar; and the remarks of the author of *Guano Streams* and of Professor Guy, upon the spontaneous puri-



fying and clearing process which takes place even in the contents of the sewers, are sufficiently decisive upon this point. Practically, the question is not whether the companies have succeeded in supplying carefully filtered water, clear, sweet, and tolerably free from algæ and infusoria; but whether this water was originally pure or foul and unwholesome in an extreme degree. The latter is, unhappily, the true state of the case. Let us recall the fact that, between Richmond and London Bridges, two hundred and forty-nine sewers annually pour out one hundred million tons of fetid, inky, fluid along the course whence the river companies draw their supplies, and that this merely represents a portion of the defilements of which this river is the receptacle.\*

It has been stated† that, when the Southwark Water-works Company took their supply near London Bridge, they occasionally found a deposit of three inches a week in their customers' water-butts. They now take their supply at Battersea, and find fifteen inches of deposit a year in their reservoirs; whereas the Lea water forms scarcely any deposit, being almost perfectly limpid. Some years since, it was mentioned in evidence by Dr. Bostock, "that he had understood from engineers conversant with the subject, that the tide near London produces rather an oscillation than a change of water; that, in fact, the water remains very nearly stationary near the Metropolis, being backed up when the tide rises; and, when the tide falls, a certain portion is suffered to escape; but there is only a very gradual transmission or interchange of water." However this may be, it cannot be doubted that if the entrance of London sewage to the Thames should cease immediately, the current would long continue to be polluted by the deposit, which, in the course of ages, has been thrown down by its saturated waters.‡

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\* The Editor of *Household Words* adds the following list of contributions:—"The drains from soap-boilers, slaughter-houses, gas-factories, brew-houses, tan-pits, gut-spinners, fish-markets, and other cheerful and odoriferous tributaries; besides the scum derived from barges and lime-works, and colliers, and the shipping, and bone-grinders, and tar-works, and dredging machines, and steamers, and back gardens, and floating remains of creatures from knackers' yards, and rotting vegetables and what not."

† *Times* and *London Med. Gazette*: Sept. 24th, 1847.

‡ A Parliamentary Report published in 1836 contains a plan devised by Mr. J. Martin which "consisted in diverting altogether from the river every possible source of pollution within the London district, so that the water supplied from it to the existing water-companies should become as unobjectionable as a noble river in its natural state ever offered to man." This was to be effected "by the construction of a close sewer, twenty feet wide, and of



Judging by numerical details, the present water supply of London is ill distributed, but not deficient in quantity. In 1847, the London Sanitary Association reported that, out of the 270,000 houses in London, 70,000 were destitute of water supply.\* According to McCulloch, the nine London water-companies supplied 270,581 houses in the Metropolis in the year 1849, at the rate of 164 gallons a day to each house, or a total of 44,383,329 gallons per diem. The total number of houses, however, returned under the income tax assessments for the Metropolis, was then 288,037, so that there appeared to be 17,456 houses (or about six per cent of the whole) unsupplied by water. When, however, house to house enquiries were made for sanitary purposes in densely-populated districts, upwards of eighteen per cent of the houses were found unsupplied with pipe-water; but in the large parishes and districts, only five, four, and three per cent.† Still, although the poorest classes of London are unable to obtain the almost essential luxury of water distributed to their dwellings, they are not compelled to utter the ancient lamentation—"we have drunken our water for money"—a considerable, though doubtless insufficient and very inconvenient, supply is obtained from 1181 stand pipes or "plugs" by all who are willing to draw it. In 1851, the number of inhabited houses in the Metropolis had increased to 307,722. The companies are able and willing to supply water to all who can afford to pay for it, but the average annual rate for each house (about £1.12s.) is decidedly beyond the present means of many of the London poor; although, even at this standard, the rents received for the most squalid domiciles are sufficiently high to enable the landlords to secure their tenants a free supply of this necessary. It must be borne in mind, however, that forty-four million gallons of water daily are not equal to many of the principal require-

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adequate depth, along both banks of the river, from a point near Vauxhall Bridge, and terminating respectively in large receptacles to be situated in Limehouse and Rotherhithe, after running by the side of the stream for a distance of five miles and a quarter, completely preventing the discharge of offensive matter into the tide-way, by depositing all the drainage in the two grand receptacles in which provision was to be made for the destruction of noxious effluvia, and the ventilation of the sewers by large fires burning over grated openings." It will be seen how much use has been made of Mr. Martin's suggestions in forming the plan now entertained by the Commissioners of Sewers.

\* The Census table, however, gives only 262,737, as the number of inhabited houses in London on the 7th June, 1847.

† *Board of Health Report*: 1850.



ments of a city containing upwards of two and a quarter millions of inhabitants.\*

In the Parliamentary Session of 1851 this important question became the subject of deliberate consideration, pending the discussion of a "Bill for the better Supply of Water to the Metropolis," the matter will probably not be decided before these pages leave the press; but the declaration of the late Home Secretary that "some essential change must take place in the supply of water to the Metropolis, in order to render that supply the best possible in quality, the fullest possible in quantity, and the cheapest possible in price," may well encourage a hope that decisive steps are to be taken which will, at length, secure an ample supply of wholesome water for the London Poor. Although this matter has, unfortunately, assumed the character of a party question, in which several powerful interests are contending for the mastery, the strong array of scientific evidence with which the several conflicting parties back their own propositions and assail those of their opponents, must be regarded with considerable attention, not unmingled with some degree of wonder that a spirit of partizanship, probably entertained almost unconsciously, should lead men of great learning and unimpeachable disinterestedness into some of the gravest errors of special-pleading.

The following plans are, at present, chiefly under discussion :

(1) As far as we can learn from the provisions of a Bill which, when last heard of in this country, had only advanced, against very strenuous opposition, to its second reading, and with the reservation that the question was still under investigation by a committee,—the Home Secretary proposed to unite the whole of the nine London water-companies under one direction, without alteration of the present sources of supply,

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\* It is argued, in the Board of Health Report above cited, that the average daily consumption of the whole Metropolitan population does not amount to more than 20,000,000 gallons of water, or 10 gallons per individual per diem; and the residue 25,000,000 gallons must, therefore, run to waste. Mr. Homersham, (in his "Review of the Report of the General Board of Health on the supply of water to the Metropolis,") deals with this statement as follows:—"If, as according to the Board, 45 million gallons of water per day be delivered into the Metropolis, and 30 million gallons are daily wasted, it would follow that 15 millions gallons is the actual daily consumption. Deducting from this 15 millions the 5 millions conjointly used for the supply of the wholesale consumers for the watering of the roads, for the flushing of sewers, and for the extinguishing of fires, there will remain 10 millions for the domestic supply of the 270,581 houses shewn to be supplied by the Metropolitan companies, or 37 gallons per house per day, which at  $7\frac{1}{2}$  persons per



and with rates of charge which can scarcely be regarded as more advantageous to the poor than those which have long been held by the several companies.

(2) The Board of Health recommend\* that the Metropolitan supply shall be derived from certain springs extending over an extensive tract of country in the neighbourhood of Bagshot and Farnham. The Board consider it to have been satisfactorily ascertained that the water from this source, when properly collected, is unusually soft,—containing but few earthy or other salts,—and remarkably free from organic matter. It is also contended that the softness of this water will preclude its safe conveyance by leaden pipes. It is therefore proposed to collect the water at the very sources of the springs by earthenware pipes, which are to convey it to a covered reservoir at Wimbledon Common, whence it shall be distributed, for the present, through the existing apparatus for street and house supply. This supply is to be *continuous*, and will therefore admit of “the abolition of cisterns, with all their accompanying evils”.† Mr. Rammell’s examination and guagings tend to shew that the minimum yield of the springs will be 61,000,000 gallons daily. Ample provision will be made for an abundant supply of water for the

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house, comes to 5 gallons per head; from these 37 gallons per day let there be deducted 15 gallons as the ordinary supply of a water-closet for such a household, and only 22 gallons per house per day remain for private baths, horses, stables, washing carriages of all kinds, and frequently the watering of gardens, independent of washing, drinking, and culinary uses; for, under the title of house or domestic consumption, the water supplied by the companies for all these purposes included, 22 gallons per house corresponds to 3 gallons per individual per day, which is manifestly insufficient for all the purposes above enumerated.” These two calculations certainly do not at all agree; still, we think that it has been shewn, in the article on Drainage, that providing from 20 to 30 million gallons of unemployed water do escape daily through the London sewers, their cleansing effects upon those fetid channels must be taken as evidence that they are not altogether “wasted.” It is certain, however,—from the facts stated before the Board of Health by Mr. Braidwood, superintendent of the Fire Brigade, and by Mr. Baddeley, secretary to the Society for the Protection of Life by Fire—to the effect that 838 fires happened in London during 1849, “of which two-thirds would have been stopped at once, had there been means of applying water immediately”—that the surplus London water is not turned to the best advantage.

\* See the *Lancet*, June 21, 1851.

† It is now a settled opinion—admitted, it would seem, by all parties—that the unintermittent system of supply must form an essential feature in any plan which is hereafter to be adopted. Water-baths and cisterns are proved to be merely sources of pollution to the water. By keeping the distributing pipes continually full at high pressure, deposit and corrosion will be in great measure prevented, an abundant fresh supply for ordinary purposes, and for the extinction of fires will be constantly available, and a considerable saving will accrue both to the suppliers and the rate-payers.



poor, as also for public baths, street-cleansing, extinction of fires, &c. It is estimated that the smaller houses may be supplied at one penny, and the larger at two-pence per week; the water supply of the Metropolis, in the course of a few years, becoming entirely free.

Many of the arguments which have been called forth in the discussion of these two principal schemes are highly interesting and instructive, but marvellously conflicting. The *Quarterly Review*,\* while vigorously repudiating the combination of the "nine establishments into one colossal monopoly," apparently demonstrates that £25,000 per annum might be saved to the Metropolitan rate-payers in management and collection-cost alone, by consolidating the several independent Directorates into one properly regulated Central Metropolitan Commission; and that a further saving of £28,000 per annum might be effected by employing one steam power, instead of nine, in raising the water for distribution. The opinion of Mr. Quick, engineer to the Southwark and Vauxhall Grand Junction Company, is cited to the effect that a saving of not less than £65,000 per annum, on the gross annual Metropolitan water rental (£431,898), would accrue to the London public from a general consolidation of the water-works.†

A formidable body of Reviewers and Chemists have arrayed themselves against the project of the Board of Health. In opposition to the statements that the Bagshot waters "contain but few earthy and other salts, and are remarkably free from organic matter," Professor Brande and Mr. Wilmington state, according to the *Westminster Review*, that they contain from ten to twelve grains of solid matter per imperial gallon,‡ but assign to most of the specimens which they have analyzed some of the following characteristics,— "turbid, opalescent, of an ochreous tinge; depositing ochreous matter; inodorous; vapid:"—having "an opalescent,

\* March, 1851.

† It is shewn from the Engineering evidence taken by the Board of Health that, by a single engine constructed on the plan of the Cornish mining steam pumps, 388 tons of water (87,000 gallons) might be raised 100 feet high at a working-cost of one shilling; and that the whole daily supply of the Metropolis (forty-four million gallons) might be raised to the same height for £25. These are cited here as important facts capable of practical application in other cases, and apart from the circumstance that they have no bearing upon the improvement of the water supply of the English Metropolis.

‡ The late Mr. Phillips's analysis of this water, as quoted in the *Medical Gazette*, gave "only 5·7 grains of saline matter to the gallon." There must, however, be a good many different kinds of water within the 300 square miles of the Bagshot gathering-grounds.



dark, ochreous tinge, and a large flocculent, ochreous deposit;—inodorous, soft, slightly chalybeate," &c.

As evidence that the softness of the water in question is not such as to give rise to danger from decomposition of the leaden pipes employed in its distribution, the following statements are adduced: "1st,—the Bagshot water has been conveyed to the palace of the Bishop of Winchester, through a leaden pipe, for upwards of 200 years; a portion of this pipe, on removal, was found to be thick, solid, and scarcely at all acted upon. 2nd,—the town of Farnham has, for many years, been supplied with this water; no injurious effects ever having been observed, although the water is transmitted through leaden pipes. 3rd,—when this water is placed in contact with lead, under circumstances most favorable for chemical action, the metal is effected to a very slight degree only; and, indeed, is much less acted upon than by most of the hard waters now in use, including even Thames water, as supplied by the West Middlesex Water-Company." This latter statement is confirmed by Professor Thomas Taylor of the Middlesex Hospital.\* On the other hand, we are told by the Editor of the *Medical Gazette*,—one of the first chemical authorities in England,—that "the water which poisoned thirteen out of thirty-eight members of the Royal Family of France at Claremont, as well as that which poisoned the Queen's hounds at Ascot, issues from these" (Bagshot) "sands, and is remarkably soft and pure."† Further, Professor Clark, of Aberdeen, stated to the General Board of Health that he obtained a specimen of the water which had poisoned the Queen's hounds, and had affected one of the huntsmen with painter's colic, "and in a few days came to the unexpected result that filtration would separate the lead." It is evident that very different kinds of water are referred to by conflicting authorities;—it is to be trusted that should there ever be a "meeting of the waters" at Wimbledon, these various properties will be rendered less unobjectionably inherent by the admixture.

Did not the sanitary welfare of two millions and a quarter of our countrymen hang in the balance, it would be absolutely a literary treat to observe the skirmishing finesse with which the rival parties maintain their system of attack and defence. The "Reform Party" exclaims against the impurity of the Thames water at all points, and under all cir-

\* *Lancet*, loc. citat.

† *London Medical Gazette*: June 20th, 1851. p. 1082.



stances; the "Conservatives" make a stand for up the river, either above Hammersmith, or somewhere about the source of the West Middlesex water-works, (which they describe as situated "between Barnes and Chiswick," or, "near Barnes;"—while their opponents define the spot as lying "nearly opposite Hammersmith"—"a point at which the sewage of that large town is discharged into the Thames, while a great part of the refuse and drainage of London is carried up thither by the tide,") not taking much into account the vast number of towns and isolated buildings which are drained into the river above that debatable locality. Other parties, again, proceed further up to Henley, and even Maple-Durham, about forty miles above London, is recommended as the source of the Thames supply; next, the impurity of the Thames water is very strenuously attacked,—at best, it is too hard for culinary and cleansing purposes, and, as now supplied, it is, in addition, revoltingly contaminated. To this it is replied that Thames water "taken from proper parts of the river," is "very unexceptionable;" that it suspends only "a small quantity of organic matter," and that "whether a person drinks a quantity of animalculæ, or not"—"is unimportant as a matter of health."\*

The evidences of his own experiments on lead cause one really eminent authority† to dilate upon the "the very dangerous uncertainty connected with the use of very soft or pure water." This last objection, which would have vastly amazed our less scientific ancestors of Hugh Middleton's day, is met by the suggestion of employing "tubes of glass, earthenware, glazed iron, or other incorrodible material," "instead of these leaden conduits; which, independently of their poisonous quality, are actually *costlier*, and less durable than either of the above-named substitutes."‡ Another authority views this proposal with infinite disdain, as "a scheme similar to one for stone pipes, which ruined some companies, when attempted about thirty years since."§ Upon the whole, the aggressive, in this strife, is chiefly maintained by the "Reformers" or "Purists" of the Board of Health.—(It must

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\* Professor Brande's evidence, as quoted in the *Lancet*, July, 1851.

† *Medical Gazette*: June 20th, 1851.

‡ *Quarterly Review*: March, 1841.

§ *Westminster Review*: January, 1851. A little further on, in the same article, the extensive employment of iron "glazed pipes" in the water supply of Edinburgh, is incidentally alluded to, without any comment upon their imagined effects. Indeed, they appear to have answered remarkably well for several years.



be premised that this party have a somewhat rash and irregular chemical force, while their opponents muster very strongly in this respect, numbering several old and wary analysts in their ranks.)—The “Impurists” are attacked in their strong position, “above Hammersmith,” with the charges, that the Thames water is inferior to the average quality of water supplied to towns; chiefly,—(1) on account of its excessive hardness; (2) of its containing (even above the reach of pollution from the sewers of the Metropolis) an excess of animal and vegetable matter; (3) that, even when filtered, its excess of hardness renders it especially unfit for cleaning the skin, or for the ordinary purposes of washing, by occasioning an extravagant consumption of soap; for the preparation of tea, by occasioning waste to the like extent; and for all culinary processes, by diminishing their efficiency and increasing expense; (4) that these hard waters act upon and dissolve lead. These objections are applied equally to the waters of the Thames, the Lea, and the New River.\* With regard to the *first* objection, the Editor of the *Medical Gazette*, (this authority is chosen for its known validity, in preference to several others,) shews that the Board have formed their conclusions upon a loose statement by Dr. Lyon Playfair, that the average hardness of water supplied to the various large towns of England is “probably” not less than 7 or 8 of Clark’s degrees, while the average of the Thames delivered in London, is not more than 13 degrees. On the other hand, the Editor states that “the Thames” (West Middlesex) water has been lately compared with fourteen samples taken indiscriminately from different towns. With two exceptions, the Thames water was softer than any of these samples, and the two exceptions were Artesian waters, which are naturally soft, not from purity, but from the chemical nature of their constituents. Some of these samples, which are in good repute in their respective localities, were half again as hard as the Thames water above mentioned! When compared with well-waters, upon which the inhabitants of many towns and of most villages, rely for diurnal use, the Thames water is incomparably softer.”†

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\* *Board of Health Report.*

† The Board of Health have stated as follows, in their Report on the Metropolitan water supply:—“We had 424 different specimens of water from different parts of the country tested, and we find that, in respect to hardness, the following are the results:—

1. Wells and springs (264 specimens), average hardness, 25°86.’
2. Rivers and brooks (111 specimens), average hardness, 18°05.’
3. Land and surface drainage (49 specimens) average hardness, 4°94.’



The answer to the *second* objection appears to be left with Professor Brande, whose opinion has been already cited, and with Dr. Alfred Taylor and Mr. Aikin, who remark as follows—"That the proportion of organic matter contained in this water" (supplied by the West Middlesex Company) "is so exceedingly small, that, in our judgment, it cannot affect health. It would be scarcely possible to procure potable water, in large quantity, entirely free from organic matter, and when the proportion is so small as not to affect the colour, taste, or smell of the water, there is no reason to believe that injury to the health can result from its presence. We have submitted the clear and sedimentary portions of the whole of these waters to a microscopical examination, and have found vegetable matter, with a few living infusoria (paramecia and monades), only in the brown sediment, which had been allowed to accumulate from about sixty ounces of Nos. 1 and 7. The clear water of the seven samples presented, under a high magnifying power, no specimens of living animalculæ. These living organisms are, however, liable to be formed in the very purest waters, as well as in every variety of hard or soft water in which vegetable matter has been infused."\*

With regard to Prof. Brande's objection to the non-cleansing properties of the London hard river-water, the Editor of the *Medical Gazette* recoils in astonishment from the avowedly "rough" estimate hazarded in the Report, that the quantity of soap consumed is 800 tons per month, and that the sum of *five millions* per annum—about one-tenth of the revenue of the British Empire—or fifty shillings per annum for every inhabitant of London, is actually expended for the purposes of washing.† "Where then," exclaims the Editor, "are the Great Unwashed?" He then furnishes the Board with the following plain, but conclusive facts,—that "for the purposes of washing linen, water must be boiled, whatever its degree of hardness;" "that the waters of the West Middlesex and East London Companies, when boiled for only 10 minutes, lose so much of their carbonate of lime by precipitation, that their hardness is reduced to about *one-half* of that of the cold water," that the Board's authority, Dr. Clark, is "allowed to compare, without a single question, Thames water of its ordinary

\* From the *Times*, as quoted in the *Lancet*, June 14th, 1851.

† The Metropolitan Working Classes Association, say 12,000 tons of soap per annum; which, with soda, would cost the Londoners £630,000 a year.



hardness *before* boiling with that used in Glasgow, and which is admitted to be already soft." Lastly, that the Board appear to forget that very pure water, such as rain or distilled water, will dissolve soap to any extent, and in thus professing to provide the London public with water which will not wastefully consume soap, by reason of the calcareous salts contained in it, they are also bound to provide some rules for preventing washerwomen and others from using a larger quantity of soap with soft water than proper scientific data would justify."\* With regard to the objection that hard waters are unfit for all culinary purposes, the Editor disposes readily of M. Soyer, the sole witness on this point, by shewing that the learned *chef* has not made sufficient advance in the science of chemistry to be able to perceive the difference between *soft* and *pure* water; and that the Board have allowed him "to assert, without comment or enquiries, that Thames water, containing only 1.12,000th of its weight of calcareous salts (in the boiled state) caused an actual waste of one *pound* of tea out of every *three pounds* consumed by a London family!"†

In a long analysis of the fourth and most important statement,—that the hard waters at present supplied to London are especially liable to corrode and dissolve lead,—the Editor of the *Gazette* demonstrates, that lead-colic, as a result of the use of Thames water is wholly unknown; that, probably, no water in the world is entirely destitute of some action on lead; that pure water, unless entirely deprived of air by some artificial process, becomes poisoned by contact with lead, even although the leaden pipe or vessel be full; that the Board and their witnesses do not appear to recognise any distinction between *pure* water and *soft* water. Pure water is always soft, but soft water is not necessarily pure: it may owe its softness to the very small proportion of mineral matter contained in it, (which may not be sufficient to render it hard in the common sense of the word), or to the presence of carbonate of soda in large proportion; at the same time, the causes of *hardness* are manifold, some of them leading to a powerful action on lead, while others almost entirely prevent it. "Hard" water may imply sea-water, water containing mineral or vegetable acids, or a large quantity of saline matter capable of acting on lead. Thus it is shewn further, in explanation of certain evidence adduced, regarding the rapid cor-

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\* Op. citat, April 11th, 1851.

† Ibid, April 25th, 1851.



rosion of cisterns at Hampstead and Highgate, that the waters of those places contain nitrates,—salts which tend to act powerfully on lead. It is here admitted, however, that these salts are occasionally found in Thames water.\*

An abundance of these sources of water-supply are offered to the Londoner; but still this unfortunate, having practically disproved the adage that “truth is found in a well,”—looks wistfully around, like Sancho at his Baratarrian feast, and still exclaims, with the mariner of Elde—“Water, water every where—but not a drop to drink!” Thus the London and Watford Spring-water Company receive the support of the Commissioners appointed by Government to report upon “the qualities of all the waters supplied and proposed to be supplied to London.” The Watford chalk-water is stated by the commissioners to be four degrees harder than any of the rain-waters now supplied to London. Strong doubt is expressed by several authorities with regard to the safety of permitting a large city to depend upon springs for its water-supply. The *Westminster Review*† shews that the magnificent springs which supply the city of Edinburgh with water upon a system similar to the method now proposed for London (the Bagshot project) are liable to failure. The entire produce of the springs, extending over 15 square miles of mountain, with reservoirs capable of holding about 200 days’ supply, has fallen so low as 300 cubic feet per minute,—a supply for 90,000 people. “We can, therefore,” it is added, “easily reckon what population could be supplied from a district of ten times the area,” (the Bagshot grounds are described as having *twenty times* the area) “but having about one-third of the rain-fall over the higher water-bearing strata.” Mr. Rowlandson has calculated that, in order to make due allowance for the great fluctuation in the fall of rain in the Bagshot district, the reservoirs must have a capacity equal to *one thousand million cubic feet*.‡ The *Medical Gazette* decides that the Watford water “fails in two requisites, which no ingenuity, chemical or mechanical, can supply, namely,—first, quantity or sufficiency; and, second, certainty in its permanence.”§ It must be observed, however, that the very marked differences in the Pentland, the Bagshot, and the Watford springs, as regards their modes of origin, invali-

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\* Op. citat, May 30th, 1851,

† January, 1831.

‡ *Report to the New River Company.*

§ August 15th, 1851.



date any argument which places them in the same category. On the other hand, Mr. Robert Stephenson, (no mean authority) states, in his two Reports of 1840 and 1841, that the chalk is the great water-bearing stratum, under-lying the Metropolis, from which all the artesian wells, directly or indirectly, draw their supplies; below the level of its natural drainage of the country, the chalk is charged with an enormous quantity of water, which may be obtained with extraordinary facility by pumping. He then proceeds to shew that there exists no difficulty either in deriving a supply of pure water from the springs of the chalk near Watford, or in conveying it thence to London. The advantages of obtaining a supply from this source, consist in having "spring-water already naturally filtered, in preference to that which has been drained from a portion of the earth's surface; in making use of that enormous reservoir which nature has supplied us with in the chalk; and in effecting this at a spot where no existing interests can be injured, and in a situation whence the supply to London may be conveyed with facility and economy, at a sufficient elevation to satisfy the demands of the highest part of the metropolis." Beyond this, the Government Commission have lately reported, that the area of land sloping towards Watford, and consisting for the most part of chalk hills, embraces more than 1,200 square miles, and is estimated, by Mr. Homersham, the engineer of the company, as equal to a daily supply of 408,000,000 gallons; the quantity of water which reaches the lower fissures being calculated at one half of the rain-fall.

In June, 1845, Professor Faraday (whose name, unfortunately for the water-question, does not appear in any of the recent discussions upon this subject) delivered a lecture, at the Royal Institution, in which he argued that the London public must look to the accumulations of water under-lying the London clay for their chief supply of the pure element. He described the soil upon which London is situated as particularly favorable to the realization of this means of raising water. It is composed, in going from above downwards, of a layer of gravel of moderate thickness; then an enormous bed of plastic clay, known in geology under the name of "London clay;" beneath which lie calcareous marls, gravel, sand, and freestone, succeeded by massive strata of chalk; the whole thickness from the surface to the chalk varying from 200 to 300 feet. It was further explained that, wherever the sand and chalk crop out, they must absorb the water which falls in those parts. This water



percolates downwards beneath the clay, and, finding no mode of escape, accumulates in the fissures of the chalk, ready to rush upwards through any opening which may present itself. The lecturer further shewed that the whole expense of sinking the two artesian wells in Trafalgar Square, erecting the engine-house, and laying down the mains and the pipes to fountains, was not quite £9,000. Messrs. Easton and Amos, who furnished the plans and constructed the works, contracted to work the engines for 10 hours every day, supplying 100 gallons of water per minute, to the Barracks, National Gallery, Office of Woods and Forests, Admiralty, Horse Guards, Treasury, Scotland Yard Offices, Whitehall Yard Offices, India Board, Downing Street, and Houses of Parliament, in addition to 500 gallons per minute to the fountains in the Square, for £500 per annum; being just half the sum previously paid to the water companies who supplied those departments. The water of the fountains was constantly running the same round of duty, being pumped out as fast as it returned from the basins; the supply of 100 gallons per minute was obtained from the deepest well which, at the end of the ten hours, was not lowered more than five feet under the rest level. With a little more power in the machinery, the contractors were satisfied, that the supply might be increased to five times the above-mentioned quantity. The water was described as containing 41·5 grains of solid matter per gallon, from 16 to 24 per cent. of which was carbonate of soda, which gave it an alkaline re-action. Undeterred, therefore, by the failure (in organization, not in action) of a company which was formed in 1825, and of another which arose in 1834-35, with a view to supply the existing companies with their requisite quantities from artesian wells of great magnitude, the Professor strongly advocated the extensive adoption of this mode of supply, either by new and independent companies, or by concurrence with those already existing, whenever a sufficient number of customers could be found willing to contribute to the expense.\* Recently, the *Westminster Review*† has given a very far less favorable history of the Trafalgar Square wells. We may conceive the Reviewer to be correct, when he states that the expenses, with repairs and liquidation of capital, amount to about £3,000 per annum. Faraday may have erred in the

\* *Chambers' Journal*: May 23rd, 1846. We were present at the delivery of this lecture, and can vouch for the general accuracy of the report.

† For January, 1851.



financial calculations ; but, when we are told that the water "is found to contain 70 grains of salts per imperial gallon," we are constrained to prefer the authority of the Professor to that of the Critic.

A serious doubt, however, has been thrown upon the inexhaustibility of the springs of the London chalk-basin. Mr. F. Braithwaite has observed that every additional artesian well has the effect of diminishing the water-level in all the wells already existing.\* As a proof of this fact, it was stated that, in a well at Combe's Brewery, sunk twenty years ago, the water rose, at that time, to within 70 feet of the surface, but that it now only rose to within 120 feet, shewing a diminution of 50 feet. From this and other instances it was argued that the supply of water was rapidly decreasing, and this was attributed as well to the improved under-drainage of the lands which received the falling rain, as to the increased demand upon the springs. The deep springs, therefore, were shewn not to be inexhaustible, while the supply of water from them was attended with considerable expense and uncertainty. Thence it was argued that it is necessary to consider very carefully any project for obtaining a considerable supply of water, by means of wells, from the chalk of the London District. It was also shewn that, on the 5th April, 1832, there occurred a sudden depression of 18 feet in the level of the springs, which lasted half an hour ; at the end of which time, 13 feet of the 18 were regained. Dr. Buckland remarked on the increased temperature of the water in the exact ratio of the depth ; the sympathy between the depression of water in the various wells throughout an extensive chalk-district, proving the identity of origin of the supplies. As the number of deep wells was, therefore, constantly increasing, the extra pumping upon one of them necessarily affected all within a certain distance around it.†

It has been stated that, of late, the supply of water in the well at Grenelle has become less constant, and that it is proposed to extend the boring to the depth of two thousand feet.

One of the most singular projects of the day is that of Dr. Clark, who proposes to receive the Thames, Lea, and New

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\* This of course refers merely to artesian wells, and not to the ordinary wells sunk in the London clay. The supposed liability of these latter wells to be affected by artesian boring is disproved and justly ridiculed by Faraday.

† Abstract of a Paper read at the Institution of Civil Engineers, July 10th, 1846.



River waters in reservoirs, where their hardness, together with their organic admixture, animalcules, and mud, shall be in great part removed by the addition of a certain proportion of lime. The Government Commissioners report strongly in favor of this chemical mode of softening the chalk-water; they look upon it as efficient, and even practicable on a large scale. The Messrs Hoyle have also employed this process, upon rather a large scale, and report favorably of its success. When tried upon specimens of water from the Watfold chalk-springs, this process was found capable of reducing their hardness from 17 to 3 degrees.

Dr. Clark mentions that the weight of chalk, separated by the addition of lime from the whole waters of the several Metropolitan companies, estimated at 40,000,000 imperial gallons, would be about twenty-four tons a day, or 9,000 tons a year.\* The *Times* considers it to be rather desirable that water should owe as much to nature and *as little to art* as possible, and is inclined to look with some suspicion on the preparation of fifty millions of gallons daily at an expense of £ 18,000 a year. Dr. Clark's process, however, affords a beautiful example of the application of chemistry to practical uses; and the mere suggestion has gained a well-deserved reputation for its author.

The chief of the other projects under consideration are—that of freeing the river Wandle from sewerage, and employing it for the supply of the "Surrey side" of London;—and that of forming immense reservoirs in the valleys of the Lea;† while the course of the New River is to be enlarged, and shortened in its windings by twelve miles out of forty; so as to carry the great additional volume of water which would be available for London, at the elevation of Islington. This plan, says the *Westminster Review*, is designed to give, by means of the reservoirs, that amount of soft water stored at flood time, which, mixed with the pure chalk-borne streams of the district, would offer a moderately soft water to the consumer in lieu of the present undoubtedly hard supply. Lastly, we have Captain Vetch's gigantic scheme for bringing 100,000,000 gallons of water daily into the Metropolis from the Lea, the Darent, the Colne and the Mole, by four aqueducts measuring altogether 54 miles in length.

\* *A New Process for Purifying the Waters supplied to the Metropolis by the existing Water-Companies.* Taylor—London: 1849.

† It is stated in *Household Words* that the river Lea runs through 23 small towns and villages, some of which drain their sewers into it.



We might surely imagine that England is not so destitute of fresh and unsullied rivers that the united engineering skill of London should be unable to achieve a task similar to that which was carried out by the engineers of New York in 1842. The ravages of the Cholera of 1832 awakened the authorities of that city to the necessity of exchanging their then most impure and scanty supply for an abundant of pure water. Five years' energetic labour, with a total expenditure of about three millions sterling,\* gave to the people of that capital a superb aqueduct, built nearly upon the Roman principle, and forty miles in length, supplying daily about sixty millions of gallons of the remarkably pure and clear water of the Croton.

The above conflicting statements and details of unsettled plans have been strung together, nearly in the words of the original reports, with a belief that their correlation, apart from the importance and curiosity of the subject, may prove of value after the question at issue has been definitively settled, as displaying the exceeding variety of natural and factitious difficulties which are liable to stand in the way of a salutary measure of this kind; and as illustrating the principle that an absolute relinquishment of the bias of partizanship, united with an earnest wish to co-operate in the developement of objects of national good, are essential elements in the work of Sanitary Reform.†

#### VII. *The proper Cleansing of all Streets and Thoroughfares.*

The sweeping and ablution of town thoroughfares, with a view to the sanitary condition of the inhabitants, must still be regarded in many of the best cities of Europe, as a project or after-thought of yesterday. While "the good old times" lasted, nothing of the kind was ever dreamt of in Northern Countries. The Romans constructed their superb and almost imperishable military roads merely as the tracks of their invading cohorts, and as the evidences that there the iron tread of their power had beaten a passage across the lands.‡ A

\* Including the cost of pipes, and of arrangements for distributing the water throughout the city. McCulloch estimates the original cost of the works of the nine London companies at £4,859,999. In 1849, their total annual income was £431,893.

† *Chambers' Papers for the People*: vol. vii. 1851, contain a very valuable paper on "Water Supply," replete with practical facts relative to the composition of the various kinds of water, the rules for selecting a proper supply, &c.

‡ It cannot be doubted, however, that the *Ædiles*, who were charged with the repair of the Roman thoroughfares, were also required to look to their



natural preservative instinct of antipathy to every thing swamp-like and drainable, which has still never altogether amounted to a natural love of cleanliness, appears, in all times, to have rendered the Hollander unrivalled in the act of street-keeping. In England, while large cities were gradually becoming extended into the fields and gardens of their vicinage, the original miry lanes long continued to suffice for the horsemen; while pedestrians, being of a class not frequently consulted in matters of public convenience, might pick their way as best they could. Gradually, however, as luxury and refinement gained ground, it was discovered that the great thoroughfares of towns must be cleared and levelled for carriages and sedans,\* and that free access must be obtained to the great shops and better class of dwellings. Indeed, it is to this principle that most of the towns of Europe mainly owe whatever cleanliness their chief thoroughfares can, at present, boast of. The elegant carriages, and the richly-laden waggons must pass without impediment; the majority of town councillors have learned practically that

proper cleansing. The author of the paper on *The Sanitary Movement*, already quoted, alludes to the fact that opposition was offered to Philip Augustus when he wished to pave the miry streets of Paris. It was not until a fatal accident occurred to a prince of the blood-royal, that an ordinance was passed excluding the burghers' pigs from a free range through the avenues of that city. A reference to Prescott places the Mexicans in advance of all other ancient citizens in this respect.—“A thousand persons were said to have been employed daily in watering and sweeping the streets, so that a man—to borrow the language of an old Spaniard—‘could walk through them with as little danger of soiling his feet as his hands.’”

\* Mr. Cunningham mentions that the first toll we know of in England, for repairing the highways, was imposed in the reign of Edward III. for mending the road between St. Giles' and Temple Bar. We have already seen that, in 1532, an Act was passed for improving and paving the City, the streets being “very perilous and noxious” for all “on horseback as on foot with carriages.” These “carriages” were, of course, either wains or horse-litters, as coaches were not introduced until nearly thirty years later. Early in the seventeenth century, matters had not much improved in this respect. Taylor, the Water Poet, describes it as “a most uneasy kind of passage in coaches on the paved streets of London wherein men and women are so tost, tumbled, jumbled, rumbled, and crossing of kennels and dung-hills and uneven ways.” We have noticed that an attempt was made, but apparently without avail, to establish a system of street-cleansing in London, not long previously to the Plague and Fire. When we recollect that, a hundred years ago, the roads had to be specially prepared whenever the King was about to open Parliament, we cannot be surprised at finding a poet of that day apostrophising the fashionable lounge as—

——— “the paths of fair Pall-Mall.

Safe are thy pavements, grateful is thy smell.—

Yet still ev'n here, where rains the passage hide,

Oft, the loose stone spirts up the muddy tide

Beneath the careless foot.”—



wealthy customers must not be expected to wade through mud, or to be blinded with dust on their way to their jewellers' or tailors' shops; and, towards the court-ends of cities, the residents will of course permit nothing foul and unseemly to come "between the wind and their nobility." Still, all the world over, wherever the poor are crowded together in narrow alleys and obscure throughfares, the ways are found to be muddy and loaded with accumulated filth and offal, manifest indications of the neglected minds and unclean and diseased bodies of those who herd in the adjacent dwellings.\* The better "spirit of the age" is, however, gradually endeavouring to remove this evil, by shewing that, as neglected ditches and undrained swamps are the sources of ague in rural districts, so are filthy and dusty ways prevailing causes of typhoid miasmata in densely-peopled towns.

In a Report on the sanitary condition of large towns in Lancashire, published by the Health of Towns Commission, it appears that England had little to boast of in this respect, even so late as 1845. Dr. Lyon Playfair presented tables shewing that Liverpool had 65 scavengers; its chief streets were swept twice a week; the cost of scavengering was £4,820; the amount obtained per annum for refuse was £1,150. It will be well to remark, in passing, that even the best streets of the unhealthiest town in England were only cleansed twice in every week. Manchester had 78 scavengers; its streets were also swept weekly; the annual cost was £5,600; the amount obtained per annum for refuse was £800. Edinburgh had 114 scavengers; its streets (that is, its main thoroughfares, but certainly not the wynds and courts of its poorer quarters) were swept every day; the annual cost was £12,000; the amount obtained for refuse was

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\* The following may be taken from a multitude of others, as by no means extreme examples. Dr. Baron Howard states that, in the unhealthiest quarters of Manchester, "whole streets are unpaved, and without drains or main sewers; are worn into deep ruts and holes, in which the water constantly stagnates; and are so covered with refuse and excrementitious matter as to be almost impassable from depth of mud, and intolerable from stench." There—"of 687 streets inspected by a voluntary association, 248 were reported as being unpaved, 112 ill-ventilated, 352 as containing stagnant pools, heaps of refuse, ordure, &c. Of the streets of Leeds, 68 only are paved by the town, that is, by the local authorities; the remainder are either paved by owners, or are partly paved, or are totally unpaved, with the surfaces broken in every direction, and ashes and filth of every description accumulated upon many of them." And such is still the condition of a very large proportion of the London suburbs, as well as of most other English towns, but especially of those in which trade and manufactures are most active, and population most upon the increase.



£10,000. Glasgow had 64 scavengers; the principal streets only were swept daily, the others less frequently; the annual cost was £2,759; the amount obtained per annum for refuse was £1,100. Dr. Playfair justly adds, "in the preservation of streets and roads frequent scavengering proves a positive and direct economy of public money, and in the prevention of disease an evident, though not less certain, saving of public burdens." Indeed, it has been practically demonstrated that street-cleaning may, under good management, be made highly remunerative. It was lately stated\* that in Aberdeen (of late a remarkably well-ordered town), the streets are swept daily at a charge of £1,000 yearly, and that the refuse is worth £2,000. In Perth again, the cost of cleansing is £1,300 annually, while the value of the sweepings is £1,730.†

\* *"The Sanitary Movement:"* p. 22.

† The following is certainly a true and unexaggerated description of our Metropolitan thoroughfares in the present day:—

"London is as dirty as ever, less foul certainly than Paris or the older parts of Edinburgh, because in all domestic arrangements, the English far transcend the French, Scotch, and all other nations; but still, as respects its thoroughfares, so generally unclean, so unscrapped, and unswept, that its condition is the surprise of every stranger. The answer usually made by an inhabitant of the Metropolis to any observation on this delicate subject is, 'that the immense traffic in the streets precludes the tidiness which might be desirable—that London is wonderfully clean, all things considered.' In reply to such answers we can only state the following undeniable facts. Streets in which there is most traffic are occasionally the cleanest. Lanes and streets enjoying comparatively little traffic are, in many instances, the most uncleanly. But, in point of fact, there seems to be no regular principle either as to cleanliness or dirtiness. In a walk of three or four miles, in a tolerably straight-forward direction, you will pass through a dozen degrees of impurity. One stretch of street will be clean, the next lying one or two inches deep in mud, the next clean, the next dirty, and so on; Regent-street, Oxford-street, St. Giles's, and Holborn, offer a few specimens of these varieties. While remarking that Regent street and some parts of Oxford street are invariably clean, we have observed that some parts of St. Giles's and Holborn continuation of the latter street, have lain unswept for weeks. In dry weather, the unswept streets would soon become impassable from dust, were they not in such seasons daily deluged with water. The consequence of this practice is, that the thoroughfares of London are never free from wet impurities, and the exhalations arising from them. The watering is performed on a scale of universal liberality. Streets that are paved with wood, and would, if swept, throw up no dust at all, are as profusely irrigated as if they were macadamized roads. A natural result is, that these wooden-pavements swimming in wet and dirt, present no sufficient hold for the horses' feet, and are complained of for their extreme slipperiness, while the real defect is in the want of a uniform and comprehensive system of sweeping. When the causes of this defect are enquired into, they are found in the number of jurisdictions into which London is broken up (about eighty it is said), as far as cleansing and paving are concerned. Each petty parochial management contracts with persons to remove impurities from the streets, and the contractors feel themselves under no obligation to act from any consideration save their own convenience. Remonstrances have been made by public bodies as to this antiquated and imperfect system of cleaning, but, hitherto, without avail. Though petty, the jurisdictions are po-



It is, or used to be, a very sensible rule in Edinburgh, to allow any person, who might choose, to appropriate the sweepings of the streets, providing they were not punctually removed by the contractors. In most crowded towns, the street refuse gains wonderfully in value in proportion to its age; long grinding under the wheels of vehicles renders it "thick and slab" as a material for plaster and Roman cement; continually-added contributions of soot and straw, and of all other kinds of refuse, long soaking and fermenting in the kennels, daily enhance its manuring properties, cent per cent. Where then will our citizens discover a dust-dealer whose activity would not be sharpened by that balancing of interests which results from competition.\* In a valuable recent article we are told that "the 300,000 houses of London are interspersed by a street surface averaging about 44 square yards per house, and therefore measuring collectively about 13½ million square yards, of which a large proportion is paved with granite. Upwards of 200,000 pairs of wheels, aided by a considerably larger number of iron-shod horses' feet, are constantly grinding this granite to powder, which powder is mixed with from 2 to 10 cartloads of horse-droppings, per mile of street per diem,† besides an unknown quantity of the sooty deposits discharged from half a million of smoking chimneys. In wet weather, these several materials are beaten up into the thin, black, gruel-like compound, known as "London mud;" of which the watery and gaseous parts evaporate during sun-shine into the air we breathe; while the solid particles dry into a subtle dust, whirled up in clouds by the wind and by the horses' feet. These dust-clouds are deposited on our clothes and furniture; on our skins, our lips, and on the air-tubes of our lungs. The close stable-like smell, and *flavour*, of the London air, the rapid soiling of our hands, our linen, and the hangings of our rooms, bear ample witness to the reality of this evil; of which every London citizen

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litically speaking, powerful; and we know of no means of quelling them but a legislative measure in the hands of an energetic Government. It is notorious that unless Government had stepped in to reform the Metropolitan Police, and taken it in some measure under its own management, it never would have been reformed. A similar movement is now required with regard to the scavenging of London;—the parishes will not, and the people can not move. Every abuse will continue, unless, in carrying out the improvement of towns the Government vigorously interfere to remove this great and inveterate nuisance.—*Chambers' Journal*: October 19, 1844.

\* *Quarterly Review*: March, 1851, pp. 482-483.

† This statement is merely given approximatively.



may find a further and most significant indication in the *dark* hue of the particles deposited by the dust-laden air in its passage through the nasal respiratory channels. To state this matter plainly, and without mincing words,—there is not at this moment a man in London, however scrupulously cleanly, nor a woman, however sensitively delicate, whose skin, and clothes, and nostrils, are not, *of necessity*, more or less loaded with a compound of powdered granite, soot, and a still more nauseous substance. The particles which *to-day* fly in clouds before the scavenger's broom, fly *to-morrow* in clouds before the parlour-maid's brush, and *next day* darken the water in our toilet basins, or are wrung by the laundress from our calico and cambric."

"It appears from experiments instituted by Mr. Lovick, that a jet of water from a well-charged main, made to play through a hose and nozzle upon the pavement, will repeatedly and thoroughly cleanse the street with an expenditure of one gallon of water per yard of carriage-way, and half a gallon of water per square yard of foot-path, or about 11 million gallons for the total area of the Metropolis. Mr. Lee of Sheffield, having at command a stronger hydraulic pressure, performed the same work with a third less water and in a third less time. The stones thus washed shine out as white as if they were just laid; and the cost of thus brightening up the Strand every day would come (on Mr. Lovick's estimate) to 3*d.* per house per week: or, with the higher pressure employed by Mr. Lee (and proposed for adoption in the Metropolis), to 1*d.* per house per week. The jet, when directed upward, in the form of spray, was found to wash, cool, and sensibly freshen the air,—acting indeed as a *moveable fountain*. The cleansing of the same surface by hand-sweeping and cartage proved incomparably less effectual and nearly six-fold dearer. As for the cost of removing the same soil after its settlement (though partial only) on the furniture, clothing, and persons of the Strand-residents, it is approximately represented by the difference between town and country washing-bills; and if this difference be taken as only 6*d.* per individual per week, it gives a balance of 5,000 per cent. in favor of steam-power cleansing;—in economy, be it observed, wholly independent of the further incalculable saving in wear and tear of furniture and dress, in health, strength, doctor's bills, &c., which would result from this substitution of public for private cleansing by means of structural consolidation."



In a Report presented to the Sewer Commissioners by Mr. Chadwick, it is mentioned that "the expense of cleansing the main-streets of the Metropolis, and a mere pretence of cleansing the by-streets and courts, is estimated in round numbers at upwards of £50,000 per annum. "In 1850, the expense of cleansing and watering the township of Manchester was 13½*d.* for every 1,000 square yards of surface swept.\* In paved streets the mode of cleansing should always be by ablution; macadamised roads in towns can only be kept in proper condition by sweeping and moderate watering combined. In London and in other cities which are intersected by a river, water raised by steam-power or otherwise, from that source, should be fully equal to the cleansing and sprinkling of the streets, as well as for the supply of numerous fountains during the hot months. Water from such a river, when freed from the pollution of town drainage, should supply all requirements except those of drinking and personal ablution. Raised by powerful engines, its supply for street and sewer cleansing; for the extinction of fires; the washing of houses, stables, &c.; for the first rinsing of linen; the watering of plants, gardens, and shops; the cleaning of horses and carriages; the supply of steam-boilers, dyers' vats, and tanners' pits, &c. (each establishment receiving its supply through a filtering apparatus if necessary,)—might always be obtained at a moderate rate, and enable the inhabitants to economise their pure water supply very considerably. All practical observers concur in testifying to the demoralising and impoverishing tendencies of street filthiness, house dirt, and personal uncleanness, among the poorer inhabitants of large towns.

It is as unwise, as it is untrue, to maintain that the poor are *naturally* dirty in their habits, and negligent of order. Such is assuredly not the case with the agricultural peasantry of Europe in general. It is only in crowded towns, where every object within and without the dwellings of the labouring classes is neglected, sordid, and decaying, that the personal habits of the men become of necessity adapted, rather than assimilated, to the surrounding depressing influences. No hard-worked man, or female oppressed with household cares,

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\* It was lately reported that the City authorities were actively engaged in considering a comprehensive system of street-cleaning, either by "street orderlies," or on the ordinary plan,—the critical question being that of *expense*. It certainly does appear that the appointment of active and respectable street-keepers would be an important step towards securing the cleanliness of towns and villages.



will long continue to feel the necessity of daily cleansing and ordering a room into which the light barely struggles through the patched and broken panes of its single window sufficiently to shew the floor stained, rotten, and uneven; the walls and ceiling cracked and dilapidated, blackened with soot and yellow from age; the stove rust-corroded and dropping from its mortarless brick-work:—where the common stair of access is as foul as Smithfield pavement on a market day, and where the street without is partly dung-heap and partly swamp. There is scarcely any degree of innate delicacy which could long hold out against such absolutely degrading and demoralizing influences as these. While man continues to be “a creature of circumstances,” it would be as irrational to imagine it possible that neatly-clad and cleanly-minded poverty should be engendered in the neglected purlieus of our great cities, as it would be to look for ambitious scholars among the Esquimaux, or men of high honor among the offspring of Hobart-Town convicts. When pestilence next threatens England, it is to be trusted that our countrymen will have learned to profit by the teaching of their sanitary reformers long before—

———“o’er the sickening city, Plague,  
The fiercest child of Nemesis divine,  
Descends. From Ethiopia’s poisoned woods,  
From stifled Cairo’s filth and fetid fields,  
With locust-armies putrefying heaped,  
This great destroyer sprung. Her awful rage,  
The brutes escape; man is her destined prey.  
Intemperate man! and o’er his guilty domes,  
She draws a close incumbent cloud of death,  
Uninterrupted by the living winds,  
Forbid to blow a wholesome breeze, and stained  
With many a mixture of the sun, suffused  
Of angry aspect.”—

VIII. *The Clearing, regardless of Opposition or Expense, of all Confined and Notoriously Unhealthy Districts in Cities; and the Partition of the spaces of Ground thus obtained as the sites of Appropriate Dwellings for the Poor.*

The importance of laying the streets of a crowded district freely open to the prevailing winds has already been fully alluded to in our remarks on the ventilation of towns; but something more than this is required in nearly all those portions of the ancient cities of Europe, in which the poorest classes of inhabitants are most densely congregated. It will be noticed that, in nearly all the large towns of Great Britain and the Continent, the poor have few or no proper dwell-



lings of their own, except generally in portions of the suburbs far removed from the centres in which their occupations chiefly lie. Hence it is that, in most of these cities, the thieves, the poorer labourers, the beggars, and the lowest classes of shop-keepers, are found crowded together indiscriminately,—not of their own choice, but by necessity,—in the dilapidated and deserted habitations of the rich. Abundant examples of this most unfortunate inconsistency are visible at every step in the old town of Edinburgh, in St. Giles' and Drury Lane, in Smithfield and Whitechapel.—There, are narrow, lofty, pestiferous wynds which have remained unchanged by the hand of improvement since they poured forth their murmuring thousands eager to gaze upon Darnley's corpse, smitten alike by the pestilence and the flame;—here, are obscure casements which shook at the blare of Henry of Richmond's clarions, and which, doubtless, were dim and grimy even then; here, are the very rooms in which the plagues of the seventeenth century were developed, and whence they burst "withering men like the grass;"\* here, are doors on which, under the filth-deposits of ages, it is possible the red cross with its legend "*God have mercy upon us*" may still linger—all shutting in squalid crowds among whom the never-dying Typhus Pestilence is daily generated. Indeed, in nearly every quarter of our three capitals there are innumerable houses which, some two centuries ago, were abandoned by the patrician class as inconvenient and antiquated, but which are now crowded to the very tiles by all varieties of impoverished wretches. Habitations which, in times when ventilation, water supply, and drainage, were scarcely regarded or comprehended, were considered insufficient for the accommodation of single households, are now made to receive an entire family in every corner of every close and noisome room.† Had these houses been, in the

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\* "Mr. L'Estrange takes notice that the plagues in 1625 and 1636, broke out in Whitechapel; a probable place, not only from the poor in that neighbourhood, but from the slaughter-houses, since more beasts are killed there than in any other parish in London; and consequently, more animal filth and nastiness is there to be found." "We are told that the King being in Council, was informed that the President of the Royal College of Physicians affirmed that the plague" (of 1669) "began in St. Giles' by flax. —*Dale Ingram: 1754.*" (*Sanitary Economy.*)

† See Mr. Toynbee's evidence before the Health of Towns' Commission and the accounts of the "Rookery," in which "95 small houses crowded on an acre and a tenth of ground, lodge every night a huddled swarm of 2,850 human beings!"—(*Quarterly Review: March, 1851.*) The Rev. Mr. Clay stated before the Commission that in a section of streets, courts, and yards, in Preston, which contained 244 dwellings inhabited by 2,400 persons,



first place, partially rebuilt, and, as far as possible, adapted as residences for the poor, their age, their dilapidated condition, the steepness and decay of their wooden stair-cases, the neglected state of their drains, and a variety of other obvious causes, would, very long ago, have rendered them absolutely unfit for their present uses.\* In all the poorer quarters of large towns, therefore, where the houses are unsafe or noisome from irreparable decay; where the rooms are small and inconvenient; where fever is known to arise and to linger continually; where the streets and courts are narrow and crooked, and the drainage and water supply are defective, and could only be adapted imperfectly and at a very serious outlay; in all such cases the Government will exercise their prerogative most benevolently in providing that the entire district shall be cleared, drained, and built anew. The interference of Legislative or Municipal authority, however, cannot stop here without the infliction of manifest injury. Of late years, several very noisome and unhealthy parts of London have been entirely swept away, doubtless with the result of enhancing the salubrity and "respectability" of the neighbourhoods; but these vast rasings have been undertaken mainly with a view to the improvement and beautifying of the town. A few prosaic

sleeping in 852 beds—that is an average of 5 and a fractional part for each bed—the specification was as follows:—in 84 cases, 4 persons slept in the same bed; in 28 cases, 5 in a bed; in 13 cases, 6 in a bed; in 3 cases, 7 in a bed; in 1 case, 8 in a bed; and, in addition, a family of 8 on bed-frames covered with a little straw. More recently, Dr. Gavin has stated, in his "*Address upon the Habitations of the Industrial Classes*" (as quoted in *Household Words*) that, in Leicester,—“there are eleven houses of one room each, at first used as pigstyes, but, the speculation failing, they were converted into dwellings each fourteen feet by ten, by six feet six inches high, with an average of 5 persons to each room.” In describing some houses in Clitheroe, it is mentioned that,—“in order to induce the people to live in them, the landlords made an agreement with the tenants, by which, whenever the cellars were flooded, no rent was to be paid for the month in which it occurred.”

\* However rigidly it may be necessary to carry out the improvement of towns, it will very rarely indeed, if ever, happen that the execution of sanitary measures will demand the sacrifice of ancient monuments of national interest. No true sanitary reformer would desire the removal of Shakspeare's house at Stratford, of Milton's at Chalfont, of Bunyan's at Elstow, or of the "Porch House" at Chertsey where

“the last accents flowed from Cowley's tongue”—

because they date back to the Wars of the Roses, and because their rooms are ill-constructed and inconvenient. It was not the sanitary reformers who swept away the Duke of York's Chapel on Wakefield Bridge, and Richard of Gloucester's hostel at Leicester; who tore down the chesnut beams of Hurstmonceaux, or who built streets across the graves of Coverdale and Churchill. The sanitary reformer is an improver—not a desecrator.



individuals only have ventured to enquire—what has become of those thousands of unfortunates who recently occupied the sites of these lofty stuccoed shops, these open streets, these palatial railway-stations? and the reply has, practically, been,—no one has looked to that;—that was their own affair. They are then sought for, and are found crowded and packed into those before over-crowded and pestilential quarters of the town to which “the progress of improvement has not yet advanced.” It is now understood to be scarcely less than an important principle in political economy, that the labourer should reside as near as possible to his sphere of labour:—in removing the habitations of the poor, therefore, it is always necessary to enquire, first, what have been the causes of the present over-crowding; and, next, how the inhabitants of the district are to be lodged after the removal of their present dwellings. It will be perceived that where injurious over-crowding in unwholesome habitations is due to the vicinity of large manufactories, breweries, gas-works, &c.—necessity, not choice, has brought the crowds together at those points, and that an injustice will be involved in their summary dispersion. We shall have to shew, hereafter, that the sufferance of large manufactories, with their almost inseparable concomitants of over-crowded neighbourhoods, can only be regarded as a public evil, which should be dealt with accordingly; still, in the absence of any established modes of procedure in these cases, it is evident that before a district, crowded with poor, is cleared and rebuilt, the possibility of finding due accommodation for the displaced inmates should be carefully looked to;\* and that the new houses erected upon the spaces thus cleared, should be, for the most part, of a kind well adapted as residences for persons of the smallest means; in other words, that they should be erected upon a scale which would admit

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\* In July 1851, it was announced that Victoria Street,—the new thoroughfare from Westminster to Vauxhall,—was open to the public; and that “for the accommodation of the families expelled by the improvements, model lodgings were to be erected in it.” This evidences a movement in the right direction; still, it will always be worth while to enquire where the displaced population are to be housed while the construction of their new dwellings is in progress, before granting Acts for such improvements. At the second reading of the Lodging Houses’ Bill, the Marquis of Normanby, Lord Harrowby, and Lord Kinnaid, suggested that whenever a bill came before them for the widening of streets and the improvement of neighbourhoods, care should always be taken to insert a clause providing for the accommodation of the displaced population in the manner contemplated in this Bill; a suggestion to which, as well as to the general approbation expressed to the Bill, the Marquis of Lansdowne cordially assented.



of every room being let at, or below, the average rate charged in the old buildings; and also that the new houses should be capable of receiving as many, or even more, inmates than the old ones formerly held. This course, like every other new and beneficial undertaking, is assuredly not without its difficulties;—still it is not a mere closet scheme, or one which a Government like our own is liable to fail in carrying out. It is a well known fact, that the prices paid for “accommodation” which is scarcely preferable to the “accommodation” of the grave, and a hundred degrees inferior to the “accommodation” afforded by the worst of our English prisons, considerably exceed, in proportion, the rates of house-rent paid in the same towns by large classes of comparatively affluent persons.\* The total revenue of a thousand Spitalfields or St. Giles’ ruins would certainly fall rather above than below the fair rent of a like number of new, well-built, and thoroughly drained and ventilated houses, furnished with water-closets, iron stair-cases, and an abundant water-supply.

#### IX. *The Prohibition of the Intramural Burial of the Dead.*

It would be hard to discover any second instance in which a practice, originating in amiable and religious feelings, has led to so much that is shameful, disgusting, and degrading to humanity, as we meet with in the late records of intramural interment in England.

No sentiment finds its way more readily home to the hearts of all men than that which prompts the dying to direct that, when his spirit has passed away, his mortal portion may not be irreverently shuffled aside, and concealed far apart from the scenes where his habits and affections centred during life. It is something greatly superior to superstition which leads a man to desire to be buried in the Church where the religious services of his life have been rendered; wherein he bestowed

\* The following measurements and rates of Rooms “ravaged by Fever in Church Lane, St. Giles,” are given in *Household Words* for July 5th, 1851:—

Room	13 ft.	by 14 ft.	..	..	6 ft.	high,	} 8s.
”	11 ft. 4 in.	” 11 ft. 3 in.	..	..	6 ft. 5 in.	”	
”	17 ft. 6 in.	” 13 ft. ..	..	..	8 ft.	”	
”	11 ft. 2 in.	” 9 ft. 4 in.	..	..	5 ft. 6 in.	”	
”	14 ft. 6 in.	” 13 ft. ..	..	..	6 ft. 5 in.	”	
”	9 ft.	” 7 ft. ..	..	..	6 ft. 5 in.	”	4s.

While the rooms in dwellings upon the principle of Prince Albert’s admirably constructed model cottages at Knightsbridge, may be let at an average rent of one shilling per week each.



the bodies of those whom he loved most to the silence of their long sleep; and in which he knows that, for many years to come, his children's footfalls will echo above his rest. In thousands of active, anxious minds, the closing of "life's fever" concentrates all the energies of earthly ambition into one eager longing for a quiet and holy repose in death;—Rawleigh's, "Bury me with my father and mother in Exeter Church"—calls forth this instinct in the breast of each of us.

Still, it is known to every one who has read the English journals for the last ten years, that no practice ever rose to a higher pitch of iniquity and public offence than the trade which profane and mercenary men have maintained for centuries in concealing beneath a mere sprinkling of earth, or a fissured pavement, or a slender boarding, thousands of bodies, in spaces which could not have received scores without offending the senses,—nay, endangering the lives of those who congregate above, or dwell within the reach of their exhalations.\*

Now that the heat of the nine-years'-long contest has subsided, and that the English Government has ordained Intramural Interment shall cease in their Metropolis,—thus establishing a principle which must, ere long, be carried out whenever British laws prevail,—any long disquisition upon the merits of this subject would be tedious and out of place. Still, the course recently taken by our Legislature may well be imi-

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\* Here are merely a few of the instances of this enormity which were revealed as existing in London a few years since.—We read of one burial ground in the Dover Road, still used for numerous interments, although, nineteen years ago, a witness (a clergyman) thought it scandalous to go on burying there; of another (St. Margaret's, Westminster), which was reported, by the Commissioners for the improvement of Westminster, to Parliament, in 1814, as unfit to be used much longer, but which is still in active operation; and of a third (Spa Fields), that there is 'no more space, but that you can always get a grave there,'—nay, graves for not less than thirty or forty persons weekly, that being frequently the number of interments. The age of miracles seems to have revived with regard to many of these burial-grounds. Martin's in the Borough, measuring about 295 feet by 379, is supposed to have received within ten years 14,000 bodies; in St. Mary's, Vinegar Yard, belonging to the parish of St. Mary-le-Strand, "better than half an acre" in size, 20,000 bodies are computed to have been interred within the last half century; whilst in a vault below a Methodist Chapel, built as a speculation by Messrs Hoole and Martin, in the New Kent Road, from 1,600 to 2,000 bodies are to be found, not buried, but heaped up in coffins, nearly all of wood, in a space 40 yards long, 25 wide, and 20 high. But all the marvels of the Churchyard must give place to those performed in connexion with Enon Chapel. This building is in Clement's Lane, in the Strand, and was built by the minister himself (a Dissenter) as a speculation. The upper part, opened for public worship in 1823, is separated from the lower by a boarded floor merely; and in this space (about 60 feet by 29, and 6 deep) 12,000 bodies are estimated to have been interred.—*Knight's London*: 1843.



tated by the Governments of other countries. There are only one or two European States in which the mortality is lower than in England, yet the purity of our atmosphere is impaired, and the severity of our epidemics increased, year after year, by the exhalations of from four to six hundred thousand recently-buried dead;—upwards of sixty thousand of whom have themselves fallen victims to pestilential disease. A few of the leading details of the reform measures which have recently been introduced, however, claim a place here, as being fraught with instruction, which may be practically applicable in other instances.

The deaths in London range from fifty to sixty thousand annually.\* Until 1832, when Mr. Cardew succeeded in carrying out the views of Wren and Evelyn, by establishing the cemetery of Kensall Green, the interments of the Metropolitan dead were almost entirely intramural. Subsequently to this, six other suburban cemeteries have been formed; still, the expenses attending funerals at these burial grounds have been so heavy as to prevent the town from being relieved in more than a very partial degree.† In a report, made some years since by Mr. Chadwick, it was shewn that, in certain spaces of ground in the Metropolis, closely surrounded by the abodes of the living, and not exceeding 203 acres in extent, the bodies of some 20,000 adults and nearly 30,000 youths and children were yearly packed, layer upon layer. It was further shown‡ that within the existence of the present generation, upwards of a million of dead must have been interred in these same spaces; and that, even allowing that the soft parts of the body are entirely decomposed in a period of seven years, there were no less than 300,000 bodies in a state of decomposition at any one time in the graveyards of the Metropolis,—“provided the remains were not carted away as rubbish by dust-contractors, or disposed of in other manners far more sacrilegious and revolting.”

“Mortality, behold and fear!  
What a charge of flesh is here!  
Here’s an acre sown indeed.”—

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\* The weekly average mortality during the five years preceding 1851 was 963. In 1847, the deaths were 60,442; in 1849,—68,432 (these were years of unusual mortality); in 1850, they were only 48,579.

† It was mentioned (*Knight's London*) in 1843, that about 6,000 burials altogether had taken place at Kensall Green, one of the largest of these cemeteries.

‡ *Medical Gazette*, October 6th, 1846.



The Sanitary Commissioners reckoned that the decomposition of these bodies annually gave rise to the escape of two million and a half cubic feet of poisonous gas. Arithmetically, this amount of contamination of the entire volume of London air may not be regarded as excessive, even allowing that one part of the gas, in admixture with five hundred parts of atmospheric air, is fatal.\* Still, when we take into account its very extensive operation, in a concentrated form, in dense neighbourhoods surrounding over-charged burial grounds, and in close chapels and churches; the frequent contamination of springs communicating with graveyards,—a great evil, notwithstanding Dr. Angus Smith's demonstration of the fact that decomposing organic matters, in filtering through tolerably thick beds of earth, become converted into innocuous nitrates,—as well as the general deterioration of the London air, otherwise rendered dark and impure almost in an extreme degree by smoke and dust, and an infinity of other noxious emanations, it cannot be doubted that this has always operated as one of the most influential causes of pestilential disease in the Metropolis.

Beyond this, the heavy expenses attending funerals have been productive of very serious evils. Eight years since it was estimated† that the total yearly expenditure upon funerals in London amounted to £626,604; and for the whole of England and Wales, to £4,871,493, upon a calculation of about 500,000 deaths occurring annually within the registered districts. The average cost of funerals (exclusive of burial fees) amongst the working classes of London is £4 or £5. It is further calculated that the funeral of a person "of the condition of an attorney" would cost 100 guineas; that of a tradesman of the lowest class £10 or £12; of a gentleman of independent property £150 is given as a low average; that of a person of rank or title would cost from

\* Sir B. Brodie. Dr. A. Taylor has shewn that there is considerable uncertainty with regard to the degree of admixture of sulphuretted hydrogen with common air which is sufficient to destroy human life. He quotes Thénard, who found that air which contained only one eight-hundredth of its volume of this gas, would destroy a dog, and that when the gas existed in the proportion of one two-hundred and fiftieth, it sufficed to destroy a horse. M. Parent Duchâtelet, however, observed that workmen breathed with impunity an atmosphere containing one per cent. of sulphuretted hydrogen, and he states that he himself respired, without serious symptoms ensuing, air which contained three per cent. According to Gaultier de Claubry, the air in drains and sewers contains from two to eight per cent. Dr. Taylor, therefore, considers that an atmosphere containing from six to eight per cent. of the gas might speedily kill, although nothing certain is known of the proportion required to destroy human life.

† *Poor Law Commissioners' Report.*



£500 to £1,500. While in Scotland the expenses of funerals of persons of the middle class vary from £12 to £25 ; or, taking Glasgow by itself, from £12 to £50. The resulting ill-consequences, in England, were found to be the abandonment of the bodies of children whose parents were unable to raise money for their interment; the occasional utter impoverishment of widows and other surviving relations; the concealment of infanticide, from the burial of children (said to be still-born) under cover of the night; and the still more frightful evil—arising out of the burial-society system—the murder of children by their own parents for the sake of their burial-fees.

Another set of evils, represented in the Report, results from the dangerous, but often unavoidable, practice of keeping the corpse of an individual, who has probably died of a malignant fever upon the only bed in the same room in which families eat and sleep. In illustration of the ill consequences of this practice, it was shewn that, whilst the ratio of deaths from contagious diseases to the total deaths amongst the chief classes of society, in London, was, at that time, 1 in  $10\frac{7}{10}$ , the same ratio amongst the labouring classes gave 1 in  $4\frac{8}{10}$ .

As remedies for these errors in our burial system, the Poor Law Commission and the Board of Health have recommended the total prohibition of interment in the Metropolis, with due compensation to the clergy and others who may be exposed to loss by the change; the erection of reception-houses for the dead; the regulation of the price of funerals according to a series of scales or classes, providing that the whole expense of each funeral should be included in the charge fixed for its class, and should be paid for in one sum; and lastly, the burial of the dead in properly-chosen spots at a distance from the town, and apart from all habitations. The whole of these arrangements to be under the control of Commissioners appointed by Government. With regard to the details of this system, it has been recommended to plant the present burial-grounds of London with flowers and shrubs; and, in future, to leave them undisturbed, as breathing-places for the city. Mr. McKinnon, the indefatigable conductor of this measure through Parliament, shewed that the expense of giving compensation to the local clergy, during the lives of the present incumbents, and to the proprietors of private burial-grounds, as well as to clerks and sextons, if these should not be appointed to the new public cemeteries, might be defrayed by a small addition to



the poor rate not to exceed 3*d.* per head per annum; and that, if the burial dues proved insufficient, money for the first cost might be obtained by loans secured on those burial dues, and rates in aid of them. With regard to the expenses, the Poor Law Commission calculated that the new establishment charges for London burials should not exceed £251,861, being an annual saving on the then estimated total expense of £374,743. They proposed that the charge of the purchase of the land, and the structural arrangements should be spread over thirty years, and the payment of the money be charged, with interest, on the burials of persons of the middle and higher classes, which would still be greatly below the amounts usually found in undertakers' bills. Up to the end of the session of 1851, the main provisions of the new Act for the Abolition of Intramural Interment in London\* had not been carried out. The duty of selecting proper sites for the burial of the London dead was in the hands of the Commissioners of the Board of Health, who had been entrusted with £150,000, and were then in treaty for the purchase of the Brompton and Nunhead Cemeteries.†

It would be unjust to conclude this chapter without respectful allusion to the name of George Alfred Walker, a London surgeon, to whose publications‡ the Metropolis is mainly indebted for the great measure of sanitary reform sketched out above. Mr. Walker has fallen upon days in which silver inkstands—not civic crowns—are the meed of those who are the acknowledged preservers of the lives of their fellow-citizens. This, however, is scarcely to be regretted:—men of Mr. Walker's stamp work for something higher and better than popular applause, and the rewards of public generosity.

X. *The Removal of all Cattle-markets and Slaughter-Houses, Knackeries, Piggeries, &c., beyond the confines of Towns.*

So long ago as the year 1810, the Emperor Napoleon issued a decree abolishing all private slaughter-houses in Paris, and establishing in their stead five public *abattoirs*

\* The 13 and 14 Vict. c. 52, of 1850.

† The two cemetery companies claimed a total compensation of £268,111-12-8 for the concession of their cemeteries for the purposes of the Interments Act; the Board of Health offered, on the part of the public, no more than £83,727; the award of the umpire, Mr. Barnes Peacock, was £117,075-7 for the two.

‡ *Gatherings from Graveyards; Graveyards of London; Interment and Disinterment.*



in distant quarters of the environs. Of late years, two legislative measures have been introduced in England,\* which must be regarded as sufficiently enforcing the principle that all public nuisances will, in future, be abolished by the strong arm of the law. Smithfield, the great central market of London, is chiefly remarkable in the early history of the city as the scene of tournaments, riots, and cremations. We learn, however, from Fitz-Stephen, that, even so far back as 1150, it was used as a cattle and horse market. In 1320 it had become a public nuisance. In that year a complaint was laid before Parliament, by the inhabitants of Smithfield, against the butchers in that neighbourhood for digging wells or pits "without the King's licence" to receive the offal of their slaughtered beasts; which malpractice the Mayor and Corporation of London were thereupon directed to restrain.† In 1348-49, a fearful pestilence, arising in China, and traversing Tartary, the Levant, Egypt, Greece, Italy, Germany and France, ravaged England to so lamentable an extent that, according to Stow, "scarce the tenth person of all sorts was left alive." Hecker calculates that at least 100,000 persons fell victims to this "Black Death" in London. We learn from other authorities that, when all the churchyards of the city were filled with dead, the Bishop of London bestowed a piece of land, afterwards known as "Pardon Churchyard," as a burial-place; and this again becoming speedily filled, Sir Walter Murray gave the "Spittle Croft," a field of thirteen acres immediately adjoining, on the site of the present Charter House. Here no less than fifty thousand bodies were interred during the year 1349. The near vicinity of these spots to Smithfield-market renders it highly probable that they were chosen because the chief violence of the pestilence lay in that direction. Plague again attacked London in 1361. Its ravages were mainly attributed to the corruption arising from the slaughter of cattle, sheep, &c., within the city. In consequence, the King (Edward III) issued a proclamation forbidding the slaughter of cattle nearer to the city than Stratford and Knightsbridge. The interest of the butchers, taverners, and others, however, appears to have been sufficiently strong virtually to set aside even the royal mandate. Still another Act (4 and 5 Henry VII, c. 3,) was passed enjoining

\* Contagious Diseases Prevention Act, 9-10 Vict., Chap. 96; and the Smithfield Removal Act, 14-15 Vict., Chap. 61.

† As cited in the *Quarterly Review*.



"that no Butcher slea any manner of Beast within the walls of London."\* Still, this great and injurious nuisance, although often since vigorously opposed and protested against, in and out of Parliament, has continued unchecked and increasing nearly up to the present day.†

Towards the end of the last century, Dr. Johnson described the gutters of Southwark as flooded two days in the week with the blood of pigs; this evil has long since ceased to exist in the Borough; but the horrible impurity and offensiveness, from a similar cause, of the gutters of Whitechapel, of Newport Market, and of several other London butcheries, has long been a subject of indignant reprobation. It is scarcely conceivable that any person, not himself a butcher, would at present have nerve enough to traverse the entire length of pavement in front of the Whitechapel stalls on a "slaughtering day."

An admirably constructed market, occupying an area of twenty-two acres, and furnished with commodious sheds stalls, and pens well supplied with water, capable of receiving twice the number of cattle usually brought to Smithfield, was erected some years since at Islington by a spirited capitalist, who sunk a hundred thousand pounds upon the undertaking. This gentleman further proposed to erect well-adapted abattoirs in the immediate vicinity, with every other convenience and accommodation that the wants of those attending a central market could demand; but, unfortunately, the scheme fell entirely to the ground. The law recently introduced, provides that, in lieu of Smithfield, a more spacious cattle-market, with a meat-market and conveniences connected therewith, including lairs for

\* Bohun, (as cited in *Notes and Queries*) gives the law as follows—"No butcher shall kill any flesh within his scalding-house, or within the walls of London, in pain to forfeit for every ox so killed 12*d.*, and for every other beast 8*d.*, to be divided between the King and the prosecutor."

† The following numbers have been given, as shewing the progressive increase in the supply of cattle sold in Smithfield, and, of course, subsequently slaughtered in London :—

	Cattle.	Sheep.
1593 .. ..	67,500	
1732 .. ..	76,210 ..	514,700
1820-24 ..	143,453 ..	1,180,004
1835-39 ..	174,250 ..	1,338,742
1849 .. ..	223,560 ..	1,514,130

exclusive of calves and pigs, and imported cattle and sheep. This last is no inconsiderable item. During one week in November, 1851,—914 beasts, 5,174 sheep, 381 calves, and 124 pigs arrived, principally from the Netherlands and France, in the Port of London.



cattle, and slaughter-houses, shall be constructed in a suitable place, at a distance of not less than five miles from London. The authorities of the city are left at liberty to execute the provisions of this Act; but, should the corporation not signify their intention to do so within six months of the passing of the Act; or, having done so, should they fail to carry it out after eighteen months, and within three years, Her Majesty may appoint six Commissioners who shall be empowered to fulfil its requirements. On the opening of the new market, Smithfield is to cease to be a market, and no new market is, thereafter, to be opened in London, Westminster, Southwark, or at any place within less than five miles in a straight line from St. Paul's Cathedral. Nothing can be more revolting to humanity, or more injurious to public health, than the present system of slaughtering animals in private butcheries situated in the very heart of the most densely-crowded districts of London, and of other towns in Great Britain.\* The Contagious Diseases Prevention Act and the exertions of the Inspectors of markets may have somewhat lessened this evil, in degree; still, the annual out-pouring of the blood of from two to three millions of animals within the confines of a city is, in itself, a grievous nuisance. It is difficult to conceive a scene more savage than that of a crowd of ruffians goading cattle, maddened with instinctive terror at the stench of blood which assails their nostrils, into the narrow passages which lead to a confined London slaughter-house, the interior of which has never been freely aired, or thoroughly purified, within the memory of its owner, to say nothing of the detestable practice, which prevailed some years since, of precipitating sheep bodily into deep under-ground cellars, where the butcher's knife awaited them. It is stated by Mr. Gurney, that at the abattoirs of Paris, where all precautions are taken to avoid offensive exhalations, and where cruel treatment of the animals is eschewed,—“the poor animals never seemed in one instance to be alarmed, but were pinned down and killed in a very short time.” It appears† that the only public abattoirs in England are those at Liverpool and at Norwich. The first outlay upon the five abattoirs of Paris was £680,000; the revenue derived from them in 1846, was £47,608, while the expenditure only amounted to £4,958.

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\* There are stated to be no less than 4,000 butchers in London.

† *Tract on the Sanitary Movement.*



The proper construction and ordering of Markets for the retail sale of meat, fish, poultry, vegetables, &c., is another very important but comparatively neglected essential in preserving the sanitary condition of towns.\*

The provisions of the Contagious Diseases Prevention Act, and of other recent laws, have done much towards checking the public annoyance and danger resulting from the presence of piggeries and knackeries in crowded districts. By attacking the owners of such places, one by one, and indicting them as the maintainers of public nuisances, the police have, for the most part, succeeded in placing these annoyances beyond the confines of the generality of English towns. It should, however, be a rule everywhere observed that places of this description should be absolutely excluded from densely-populated districts, without any forms of trial or appeal whatever. It appears that the great Parisian knackery at Montmartre was, until lately, a source of dangerous annoyance to the inhabitants of the neighbouring quarter.†

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\* Mr. Cresy lays down the following useful rules with regard to the building and management of Markets:—"The great points to be considered in these establishments, are central position, solidity and strength, convenience, health, and command of water." \* \* \* Every possible means should be adopted for ventilation; and every precaution taken to ensure the most perfect cleanliness. The walls of a market should be carried up a certain height in masonry or brick-work, the lower openings should be provided with Louvre boards, to exclude the sun, rain, and wind, without too much shutting out the light and air. Other openings must be provided under and in the roof to afford light and air. \* \* \* A public fountain is indispensable. \* \* \* The whole should be cleaned out daily, and shut in at night."

† These were among the gravest of the evils with which the inhabitants of towns had to contend previously to the introduction of the sanitary system. Some interesting extracts, relative to this point from *Arnold's Chronicle*, probably first printed in 1502 or 1503, have lately been cited in *Notes and Queries*. There is, first, a petition from the Commons of the city of London to the "Lord Mair, Aldirmen and Comen Counsaile," requesting them "to enact that noo maner pulter or any other persons i this cytee kepe from hinsforth, within his hous, swans, gies, or dowk, upon a peyn therefore to be ordeigned." This was shortly followed by a petition seeking due punishment for the offender if "ony persone kepe or norrysh hoggis, oxen, kyen, or mallardis within the ward, in noying of their neighbours." We have already seen that the keeping of hogs, dogs, cats, tame pigeons, and conies, was prohibited during the prevalence of the Great Plague: this, however, appears to have been principally with a view to prevent the disease from being carried in various directions by these animals. Another petition in the *Chronicle* is for "the avoiding the abbomynable savours causid by the kepig of ye kenell in ye mote and ye ditches there, and i especiall by sething of the houndes mete wt. roten bones, and unclenly kepig of ye hoüdes, whereof moche people is anoyed, soo yt. when the wynde is in any poyte of the northe all the fowle stynke is blowen ouer the cite. Plese it mi Lord Mair, Aldirmen, and Comen Coucell, to ordeigne that the said kenell be amoued and sett in sō cōuenient place where as best shall seme them. And also, that the said diches mai be clensed from yere to yere, and so kepte yt. thereof folowe



# XI. *The general Adoption of Means for Consuming the Smoke of Towns.*

Until long after the introduction of sea-coal as a common article of fuel in England, its employment in towns was popularly regarded as an unmitigated evil.\*

The evil is still recognized, as existing upon an enormous scale, but recent discoveries have placed the means of remedying it perfectly within our reach. It is found that, by the employment of properly-constructed apparatuses, the smoke of furnaces and stoves may be consumed, not only with facility and absolute safety, but also with a very considerable saving of fuel. The smoke-consuming system has been, for some

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non annoyance." "Hounds-ditch" is considered to be the place here referred to. We hear of "pigs bred and fed in the houses or back sides of streets" about St. George's, Hanover Square, in 1761; and it is even asserted that at the outbreak of the cholera of 1848, in Edinburgh, similar colonies were displaced from some of the *upper* stories of houses in the Old Town.

\* In an interesting sketch of the history of coal recently given by the Rev. Mr. Anderson, in his *Course of Creation*, it is shewn that the discovery of stone hammers and hatchets in the old Yorkshire mines affords evidence that the early Britons worked coals before the invasion of the Romans. There exist records of the employment of coal in Scotland, from the year 1291. With regard to England, we are told that "about the middle of the ninth century, a grant of land was made to the Abbey of Peterborough, under the restriction of certain payments in kind to the monastery, among which are specified sixty carts of wood, and, as showing their comparative worth, only twelve carts of pit-coal. Towards the end of the thirteenth century, Newcastle is said to have traded in the article; and, by a charter of Henry III., of date 1284," [Mr. Bernan says 1239] "a license is granted to the burgesses to dig for the mineral. About this period, coals for the first time began to be imported into London, but were made use of only by smiths and brewers, and other artizans, in consequence of the smoke being regarded as very injurious to the public health. Parliament petitioned the King, Edward I., to prohibit the burning of coal, on the ground of its being an intolerable nuisance. A proclamation was granted conformable to the prayer of the petition, and the most severe inquisitorial measures were adopted to restrict, or altogether abolish, the use of the combustibile, by fine, imprisonment, destruction of the furnaces and workshops." Mr. Bernan finds that the evil became so obstinate, that a law was passed making it a capital offence to burn sea-coal within the city of London, and only permitting it to be used in forges in the neighbourhood. Among the records in the Tower, Mr. Astle found a document, importing that in the time of Edward I., a man had been tried, convicted, and executed, for the crime of burning sea-coal in London. An extant letter to Henry VIII. from the Lord High Admiral, relative to measures to be adopted to prevent the stoppage of colliers off Yarmouth, shews that, at this period, the Newcastle coal trade continued of considerable importance. Coals were freely used in the time of Charles I. The writer of the article on *The Sanitary Movement* quotes John Evelyn's complaint, as set forth in his *Fumifugium*, of the "hellish and dismal cloud of sea-coal," and of the chimneys of brewers and traders, whose "belching sooty jaws do manifestly infect the air more than all the chimneys in London put together." Evelyn assisted in preparing an Act to suppress the nuisance. That measure, however, failed.



time past, rather extensively enforced in Manchester, Glasgow, and some others of our chief manufacturing towns; but London has continued to suffer from a want of legislative restraint, with regard to this important particular, almost up to the present time.

Now, however, the City of London Sewers' Act of 1851, ordains that every steam-furnace, and every furnace employed in mills, factories, printing-houses, dye-houses, iron-foundries, glass-houses, distilleries, brew-houses, bake-houses, gas-works, water-works, or other buildings used for the purpose of trade or manufacture within the city, "shall in all cases be constructed or altered, so as to consume the smoke arising from such furnace," under a penalty of not less than forty shillings, and not exceeding five pounds, for every day during which the prohibited annoyance shall be continued. As being confined to the city proper, the operation of this law will, of course, have but a very partial effect towards removing the general smoke nuisance of London; still it cannot be doubted that, ere long, it will become operative throughout all quarters of the Metropolis, and be gradually extended to all private dwellings.

It appears that the total quantity of coals imported to London, in 1850, was 3,633,883 tons. In 1844, the annual consumption of coals in London was about 2,000,000 tons. No very considerable portion of this supply can have been conveyed away for the use of the neighbouring towns. It may readily be conceived how vastly these yearly increasing out-pourings of smoke must add to the deleterious character of the atmosphere overhanging the London basin—

"Seem they not by their black streams,  
To obscure the sun's bright beams?"—

It has been clearly demonstrated that the production of smoke is attended with a very considerable waste of combustible matter. During the last ten years, a variety of ingenious modes of preventing this waste, and its attendant evils, have been brought into use.\* At present, the great desiderata are

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\* The principal of these are as follow :—

*Iverson's* apparatus projects a stream of steam into a space between the fire and the boiler; it is considered that, in the decomposition of the steam by the heat of the furnace, its oxygen unites with the carbon of the smoke, aiding its combustion, while the liberated hydrogen also burns, through its own inflammable quality.

*Juckes's* plan accomplishes the combustion of the smoke by carrying through the furnace-grate bars, in the form of endless chains passing over rollers, and moved forward about an inch per minute; the small coal is spread uniformly over these moving bars. The air is constantly supplied



cheap and efficient apparatus for the prevention of smoke in common house-fires.

Peat, which formed one of the staple articles of English fuel previous to the general introduction of coal, and which is still very extensively used in many of the rural districts of the United Kingdom, has of late been strongly recommended by Professor Edmund Davy of Dublin, for more general employment as a fuel and a deodorizing agent.\* We have already alluded to the works at present in progress at the Bog of Allen and in other parts of Ireland for the manufacture of peat charcoal, a deodorizing agent at present in high repute. Professor Davy recommends the peat in its natural state, and in all its different varieties. He finds, from a multitude of experiments, that the peat or turf mould of every description has "similar deodorising and disinfecting pro-

through the bars directly to the fuel while burning; and, in this way, the great desiderata, a slow supply of fuel and perfect combustion, are obtained.

*Smith's* invention is grounded upon a supposition that, in ordinary combustion the extricated gases pass off directly through the flues in separate threads or films, sufficient time not being allowed for their admixture with the air, and consequent combustion. An apparatus is therefore employed, which, by delaying the smoke in a chamber below the boiler, allows time for combustion, and the gases are inflamed or exploded before going up the chimney.

It is known that, by supplying coal gradually, and in small quantities, the formation of smoke is almost entirely prevented. In *Mr. Waddington's* apparatus the coal is put in at the sides of the boiler, and is made to descend inclined planes to the bars, before reaching which it is coked by the fuel burning on the bars, and smoke is prevented. *Mr. Williams's* plan provides for the admission of jets of atmospheric air into the body of crude impure coal gas, evolved whenever fresh fuel is supplied to the furnace, and which is collected in a chamber below the boiler:—upon contact with the air, the gas instantly inflames.

The notices of these different modes are briefly taken from an article in *Chambers's Information for the People*, p. 463, where these and several other plans for consuming smoke are given in detail. It appears that some of these modes are highly economical. It was found that one of *Smith's* boilers established at Messrs. Page and Grantham's, Liverpool, working an engine of ten horse power, the pressure in the boiler being fifty pounds, did as much work with 8 cwt. coal as the best tube boiler which these gentlemen ever tried had performed with 12 cwt. After employing *Juckes's* apparatus in working a ten-horse power engine for about a year, the Messrs. Chambers (*Journal*, February, 1851), found that the saving appeared to be one twentieth of the amount of fuel, while no smoke was ever seen to issue from the chimney. It is further stated that one of the Manchester factories, which formerly consumed seventy-eight tons of coal per week, now requires only twenty tons to accomplish the same amount of work in a smoke-consuming apparatus. In another manufactory, the saving is forty tons per week. The proprietor expresses a wish that the practice of enforcing the new regulation were more general, as it would "save no trifle in the cleaning of windows, as well as prove beneficial to the public health."

\* *Essay on the Use of Peat or Turf, as a means of promoting the Public Health and the Agriculture of the United Kingdom.*



perties as when charred, and that these properties may be increased to a certain extent by the most simple and inexpensive means—namely, by separating water from it, either by exposure to the sun's rays in dry weather, or by artificial heat, without charring it, and by reducing it to a minute state of division, or to fine powder." The creosote contained in the peat is regarded as the disinfecting agent. Dr. Davy shews there are 2,830,000 acres of peat-soil in Ireland: one half of which is susceptible of cultivation, while the remainder, varying in depth from six to forty feet, promises to afford an almost inexhaustable mine of wealth and employment. It is recommended that in hospitals, ships, large establishments, wherever offensive matters accumulate, —(offensive matters should never be allowed to accumulate in such places)—a constant supply of turf-powder should be kept, to be sprinkled from an instrument similar to a flour-dredger, whenever required.

A few words may be added here with regard to *Disinfectants*. The number of agents which have the power of effectually neutralizing putrid exhalations in close rooms, and in other confined situations, is far smaller than is popularly believed. Combustion as occurring in a common grate, the smoke of wood, and the fumes of chlorine and of acetic acid, are the chief of the agents which exercise this property in a certain limited degree; indeed these are very far less operative than is generally supposed; employed alone, and with the necessary moderation, they are insufficient, and in their full action they merely substitute an irrespirable for an offensive atmosphere. The antiseptic effects of all perfumes and volatile oils, with the exception of creosote, whether employed in the shape of pastiles, essences, or fumigations, must be absolutely distrusted. These means tend merely to disguise unpleasant and injurious exhalations, until the volatile poisons reach the most noxious degree of concentration. They are not to be regarded either as disinfectants or antiseptics. *Pure Air, Pure Water, and Intense Heat*, are Nature's own antiseptics, antiputrescents, and nothing but the most careful precautions for the preservation of cleanliness, aided by the employment of one or all of these, can under any circumstances maintain densely-inhabited towns, dwellings, and ships in a wholesome condition. Subject to this principle, and with due regard to the fact that ill-savours are useful, as leading to the detection of impurities, which might otherwise remain as the undiscovered sources of pestilence, quicklime, common whitewash, chlorine, charcoal, nitric, and sulphurous acid



fumes, acetic acid, the sulphite of soda, nitrate of lead (in the form of Ledoyen's disinfecting liquid), &c., may be often employed as useful auxiliaries.

XII. *The Erection of all Extensive Manufactories at the Distance of at least Two Miles from the Confines of Large Towns ; with the Provision of their being Constructed in Healthy Situations, and with proper regard to Security, Ventilation, Warming, &c.*

The evils which attend the presence of large manufactories within the bounds of cities are evidently two-fold, arising, 1st, from the deterioration of a confined atmosphere with smoke and other injurious exhalations ; and, 2nd, from the employment of large numbers of work-people in situations where sufficient access of pure air is scarcely attainable, as well as from the crowding of undue numbers of impoverished persons in miserable and ill-adapted tenements, within narrow and insufficient spaces, in the immediate vicinity of the manufactories. Without attempting to deny that, partly owing to stringent legislative and police regulations, and partly in consequence of the awakened humanity and enlarged knowledge of the proprietors, the manufactories of the United Kingdom are now generally to be regarded as the grandest and best ordered work-shops that the world has ever seen ; it must be apparent that they are absolutely misplaced within the confines of large and populous towns. Giants among dwarfs, their very presence is oppressive,—they can only exist with advantage in a region, and an atmosphere of their own. In tracing out the comparative rates of mortality in town and country districts, we have seen that wherever manufactories are most numerous, there the value of human life is at its lowest standard ; and this not merely among the labouring classes, but even among the wealthier inhabitants. The crush of population which increase of manufactories occasions in ancient cities, and the slovenly style of building upon ill-adapted sites, which has hitherto obtained wherever towns have rapidly sprung up around active manufactories, are evidently the main causes of mischief here. It cannot be too often repeated that, wherever over-crowding occurs among the poor, neglect of cleanliness and of decency, gross immorality, destitution, crime, rapid constitutional decay, and pestilential visitation, are evolved with the same certainty that attends the deduction of mathematical corollaries from their several propositions.



Retaining London as our chief example, we have already found that the air which visits its densely-compacted streets, over an area of 1,951,000,000 square feet, has daily to supply oxygen to some 300,000 fires and furnaces, and to the lungs of 2,300,000 human beings, and of at least an equal number of horses, cattle, and other animals; that from the 74,000 acres of its inhabited portion, there arise the dust, and impure surface and sewer exhalations of 13,250,000 square yards of street, and 2,700,000 feet of cess-pool surface, as well as the dense smoke from the 300,000 fires above alluded to. When we add to these the 30,000,000 cubic feet of carbonic acid gas, which are calculated as being exhaled daily from the lungs and skin of the inhabitants,—to say nothing of the quantity contributed by the myriads of lower animals,—and take into account the exhalations from 300,000 imperfectly-buried corpses, and the waste of 13,000,000 cubic feet of gas supplied to the city daily, we certainly perceive why it is that our capital realises Bishop Corbet's description of Paris, late in the 16th century:—

“ 'Tis wondrous fair, 'tis nothing clean,  
    'Tis Europe's greatest town;  
How strong it is, I need not tell it,  
For all the world may easily smell it,  
    That walk it up and down.”

And we also do appear to gain an insight into certain of the causes which render typhoid pestilence indigenous to the city, and which detain and foster into tenfold malignity every epidemic scourge, which may happen to take its course in that direction.

The destructive effluvia from certain kinds of manufactories form no trivial item in the causes of disease among the inhabitants of towns. One out of a vast number of examples of this fact may be given, from the Report of the “Health of London Association,” on the sanitary condition of the Metropolis; in which it is stated, by an inhabitant of Stratford (atte Bowe), that “noxious fumes of nitrous acid gas from a neighbouring chemical work, are frequently so extremely offensive, that persons passing along the main road are obliged to run, and hold handkerchiefs to their mouths; the eyes are much irritated by the gas, more particularly in the night time, during which the works are in full play. All metal utensils are discoloured or tarnished in the houses in the vicinity. The smell can be perceived half a mile off, which will enable a correct judgment to be formed as to its intensity.” This is described in strong language, as being one



only of a collection of nuisances. Among others, there is a work for evaporating "gas liquor," the stench of which is so foetid that, even when the poor poisoned victims living near are confined to their rooms by typhus fever, consumption, &c., they dare not, and cannot open a window, as it almost suffocates the inmates, particularly when the wind blows the fumes in that direction. The poor creatures have even been driven out by the intolerable stench into the main road, where they have asked what were they to do?—to which it was replied, "that if they could become pigs or oxen, and were killed, the law would punish the proprietors of these nuisances, by making them pay *their* value; but as they were only women and children, the law did not trouble itself about them." The Reporters add that it is to be regretted that so little legislation has been exerted on the subject of noxious or offensive manufactories; but that perhaps there is not more ground for complaint, with regard to these noxious agencies than with regard to nearly all others, which do not include the taking away of our neighbours' lives by violence; for while, in the present day, one man is certainly hanged for taking away the life of his fellow-creature, another man is at liberty to destroy the health and lives of multitudes by poisonous emanations from any source of profitable employment—the profit being on his side, the loss on that of the public.

There certainly would appear to be considerable hardship in any attempts at the summary removal of all manufactories beyond the confines of populous towns, seeing that a large proportion of such buildings have been permitted to spring up within the present century; that enormous sums have been sunk in their construction; and that, in many instances, they are scarcely to be regarded as intruders, the town buildings having, in reality, surrounded and encroached upon them. Still, it is not beyond the power of the legislature to provide, that whenever the operatives belonging to a town manufactory are unduly crowded in ill-adapted and unhealthy domiciles in its immediate vicinity, the manufacturers should be compelled either to rebuild those habitations with a due regard to the wants and comfort of their inhabitants, or to provide proper dwellings for their work-people in the environs; and even, if necessary, to furnish means of conveyance to and from the workshops. Whenever manufactories centrically situated are for sale, the town authorities need not doubt that their purchase and clearance will form a valuable investment, on the score of public health. No valid



objection whatever can be alleged against the enforcement of regulations forbidding the erection, in future, of any description of extensive manufactory, except within a certain and sufficient distance of populous towns, and enjoining that the situations chosen shall be thoroughly drained and absolutely free from any discoverable source of endemic disease : and that further, thoroughly well-constructed houses shall be provided in the neighbourhood, sufficient in number to contain the full complement of work-people employed. The advantages to public health which would result from removing factory and other operatives from the centres and suburbs of large towns, and locating them in well-chosen suburban districts, would be incalculably great. Living in a pure atmosphere, with all the means of exercise and athletic amusements, and with the delightful recreation of gardening open to them,\* our factory workers would, in the course of a generation or two, become equal, physically and mentally, to any other class of operatives in the country.

“ One heart free, tasting Nature’s breath and bloom,  
Is worth a thousand slaves to Mammon’s gains.”

The subject of the ventilation of the workshops and dwellings of the labouring classes, is one of the very first importance in sanitary regulation. It has especially engaged the attention of Dr. Guy, and has been most ably and practically dealt with in his lecture delivered at Crosby Hall, and in his evidence given before the Health of Towns Commission of 1844. Ignorance and gross carelessness on the part of employers, and the prevalence of a strong prejudice against ventilation, or rather against “cold air,” deeply rooted in the minds of the operatives, are here the main difficulties with which sanitary reformers have to deal. Whole Blue Books have been filled with accounts of the frightful squalor and misery of the rooms occupied by the operatives of Glasgow, Liverpool, Manchester,—indeed of nearly every manufacturing town in the three kingdoms. Thus, Mr. Wood, in speaking of Manchester, states—“I have met with upwards of forty persons sleeping in the same room, married and

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\* Of late years, the Messrs. Gott, of Leeds, and other humane manufacturers have allotted portions of land, laid out as garden-ground, to the workmen employed in their establishments. It is reported that these gardens are most carefully and tastefully attended to by the people, during their leisure hours. We believe that a similar practice has long been prevalent in the neighbourhood of Paris, and some other continental manufacturing towns.



single—including of course children, and several young adult persons of either sex." In Tiverton, it is described\* that—"families of six, eight, or more individuals sleep in one room—the majority not unfrequently in one bed; father, mother, grown-up sons and daughters, and young children. Well might one of the witnesses exclaim—"How could it be otherwise with such families than that they should be sunk into a most deplorable state of degradation and depravity? or that abhorrent crimes should be committed without compunction? That unchastity should find the 'cunning woman' ready to aid in concealing the shame, or rather the fruit of immorality?" Dr. Mitchell, in his evidence upon the Durham and Northumberland mines, in describing the places in which the miners sleep, declares—"for my own part I cannot but believe that these lodging-houses are more destructive than the air of the mines;" and one of the workmen states—"I consider the lodging-shops more injurious to the health of the miners than their work itself." An unfortunate weaver, suffering from pulmonary disease and hectic fever, informs the Commission on the State of Towns, that he "lived in a very good neighbourhood," but that "there are several localities in the town which are the very reverse, and where the great masses of the operatives congregated." In his own case he "was situated very well; it was only the air in the room," in which he laboured from fourteen to sixteen hours a day, and which he observed to be vitiated in consequence, there being no ventilation. The drainage at the back of this house was imperfect; when at work, he appears scarcely ever to have opened the windows to admit the fresh air. "Many of the fathers and mothers," he says, "are prejudiced, and do not know the evil that springs from it" (defective ventilation), "they never observe it. When I have mentioned the injurious effect that this vitiated air had upon my constitution, that I felt it exhausting my strength, it was looked on as a sort of nonsense, and a new-fangled notion that was not worth attending to." The poor fellow's mother had died of consumption in that pent-up room, and he was about to fall a victim to the same malady. With regard to the condition of the places of labour, the only difficulty is in selecting from the multitude of evidences of their ill management and unhealthiness. Dr. Willis, in his evidence before the Commission on the State of Large Towns, says,—“let us visit

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\* *The Sanitary Movement.*



a milliner's work-room, (the milliners are the most cruelly oppressed class of the community,) or a large tailor's shop—we shall be surprised to find human beings doomed to pass their days in such atmospheres. I lately visited the shop of a tailor in extensive business, on the mind of the proprietor of which I had been urging the necessity of ventilating the place. On entering this shop, my spectacles immediately became dim, so that I could see nothing; I asked what means do you take to warm your shop? He said—'Oh, there is no necessity to take particular means to warm it, the animal heat brings it up high enough.' The smell produced by the application of hot irons to woollen cloth, when moistened with saliva, as is the custom among tailors, in addition to the effluvia emanating from a crowd of human beings seated together in a confined space, will scarcely fail to make the strongest person recoil. The proprietor of the establishment I allude to, for he is a kind-hearted and an intelligent man, told me he had gone to considerable expense in endeavouring to secure the proper ventilation of his work-shops, but the men stopped up the apertures by which it was meant to be effected."

We have abundant evidences of the fact that, as regards their state of health, the operatives are decidedly better situated when entirely out of work than when employed in close and ill-ventilated manufactories. Mr. Twiss remarks,\* "It is not always the want of employment which is fatal to the operative classes; it is sometimes the very employment itself, because that employment confines them during the whole day in close and ill-ventilated work-rooms. Thus at Paisley, in May, 1832, during a period when there was almost an entire cessation of work, and such universal distress that the aid of Government was required to co-operate with private benevolence, the physicians of the Fever Hospital were surprised by the diminution of at least one-eighth in the average of fever cases, as compared with the previous five years. When, however, a time of brisk employment succeeded, and the whole population were again at work, a new epidemic broke out. In Manchester a similar reduction of mortality was experienced in the years 1841 and 1842, which were years of great distress, as contrasted with 1840." The above instances were stated, more in detail, by Dr. N. Arnott, before the Commission of 1843. This high authority also observed—"At the time when we made our enquiries,

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\* *On Certain Tests of a Thriving Population.*



there was, in the Spitalfield's districts, an unusually severe epidemic, although there was comparatively full employment. Subsequently, the employment diminished to the extent of half the looms being out of work; and the medical officer of that district, who in times of full employment had as many as 800 fever cases to attend to in one year, then found the number fall to 250 cases. He states that—'The greatest number of fever cases we have is of persons who fall ill during the time they are in employment: I think they are more attacked when in work, when the windows are closed, and there is no ventilation. Many of them are obliged to work with closed windows, to keep out the moist air, and prevent the dust blowing upon their work. When they are out of work, they are more out of doors looking after work—more in the open air; and that very exercise may be the means of keeping them in health. This observation applies to the weavers. I find that they have generally less fever when they are out of work. The reverse, I think, holds as respects out-door labourers, such as those who work at the docks. When they are out of work, they stand about waiting in the cold; and, when cold, they generally take cheap gin and no food, and on going to their close filthy habitations, their cold is apt to generate fever.' "

### XIII. *The Prevention of the Retail Sale of Poisons.*

In future times, when it becomes the duty of historians to view the social condition of England during the nineteenth century, the investigation must necessarily lead to the expression of sentiments of the utmost horror and surprise:—horror, that among a people who strongly prided themselves upon their enlightenment, piety, and humanity, there should have been revived and extended to a most revolting degree a means of assassination which had, for nearly two centuries previously, been comparatively very rarely practised in any of the countries of Europe; and surprise, that the progress of this fearful evil continued for years unchecked, nay more, unresisted, by the otherwise powerful and vigilant legislature of the period.

It is a startling, but self-evident, fact that, in the present day, and in our own land, the crime of secret poisoning is nearly as frequent as it was in Italy during the middle ages, or in France throughout the latter part of the sixteenth and the seventeenth centuries; and it is unquestionable that even at those (so termed) semi-barbarous periods, it but very rarely assumed those characters of almost inconceivable



atrocious and malignity which now nearly day by day marks its outbursts amongst us.

It is true that in those times the crime in question was occasionally employed by wretches who, for the purpose of gain or revenge, were desirous to remove individuals of their own kindred; but, for the most part, these instances were few in comparison with those in which the murdered persons were in no way allied by blood to the criminals who sought their destruction. Through the memories of the unnumbered celebrities who have held prominent positions for good or evil in Europe, since their times, the names of César Borgia and of the Marchioness of Brinvilliers have come down to us—as familiarly as though the deeds of both were the events of yesterday—each distinguished merely by the brand of that unsurpassable atrocity,—the murder by empoisonment of their own kindred.

For the last seven years, however, the public prints have teemed week after week, with instances of husbands poisoned by their wives, and wives by their husbands; of parents destroying their own offspring by deadly drugs—for the sake of gain; nay within this period, there have been examples of children,—yes, absolutely *children* of tender age,—employing poison as a means of removing the authors of their being; and still, by what would almost appear to be something approaching to an irresistible fatality, this crime continues to advance among us, acquiring characters of blacker turpitude year by year, without appearing to produce any excitement in the public mind, or having the effect of awakening the law to the employment of more than partially restrictive measures for its suppression. We, and many abler writers, have for years past striven until our hands and hearts were alike wearied by the evidently hopeless task, to prove that the retail sale of arsenic, and of several other poisonous materials to persons not connected with the medical profession, is an utterly dangerous, unjustifiable, and unnecessary practice; and one which alone, and in itself, ought to be regarded by the law as an offence of the gravest character. Still, it is now, as it was four hundred years ago, within the power of any wretch who chooses to adopt the felon expression, that “he wants some arsenic to poison rats,” to obtain from some source or other, sufficient of the deadly material to sacrifice a hecatomb of human victims to his rapacity or his revenge.

A law has recently been introduced in England placing certain restrictions on the sale of *Arsenic*. This step, long-



wished for, and long most urgently required, must have been viewed with strong satisfaction by every one who desires the welfare of our country, as the first working of a system which will, doubtless, hereafter free society from one of the direst of the evils under which it at present suffers. Still, the legislative measure of 1851 is of such exceedingly limited operation, that the subject at large continues to demand our most solicitous attention.

It is reported that, during the ten years previous to 1849, 244 persons were tried for poisoning in the United Kingdom.

From 1830 to 1842, inclusive, the number of individuals tried for poisoning in France, was 541:—of these, 251 were acquitted, and 65 condemned to death; of this latter number 37 were executed.\* During the six years preceding 1847,—496 murders by poison were perpetrated in France.†

In proportion to other crimes committed in the two countries, these numbers may not be considered as large; still, this form of murder, of all other murders the

“most foul, base, and unnatural,”

must be viewed as standing apart in its atrocity from every other kind of assassination, as indicating, in its prevalence, the extensive diffusion throughout a people, of the lowest degree of moral turpitude and abandonment; and as tending more than any other known crime to injure the intimate structure of society, by inducing universal distrust between man and man. When, proceeding further, we perceive that a very large proportion of the deaths which occur amongst us from poison might, in all human probability, have been prevented by the operation of a stringent law, the crime becomes a matter for attentive study, its results being considered as among the “Removable Causes of Death.”

The scope of these pages will not admit of a discussion of this important subject in all its bearings:—an analysis of a few of its leading details must suffice.

In the year 1840, nine hundred and one persons died by their own hands in England and Wales.‡

\* To the total number 541, there are to be added 6 who were tried and condemned in default of appearance.

† *Annales d'Hygiène Publique et de Médecine Légale*, Tome xlv. 1851.

‡ These figures are derived from the Sixth Annual Report of the Registrar-General, for the year 1844.



Of these 161 perished from the effects of poison taken with a suicidal intent. Of the 161 persons thus destroyed, 74 were males, and 87 females; seven of the former were medical men. It appears that one druggist committed suicide by poison during the year. From a careful examination of the occupations of the whole of these individuals, it will be found that a very small proportion of their number were engaged in trades in which the use of poisonous materials is absolutely necessary. The poisonous substances employed were,—opium in 19 cases; arsenic in 26; oxalic acid in 3; prussic acid in 4. The deaths from other poisons were 109. Two of the medical men destroyed themselves by prussic acid; the other 5 by poisons not specified (neither opium, arsenic, nor oxalic acid.) From the above details, as well as from an examination of the tables whence they are adduced, we draw the following conclusions:—(1) That the occurrence of nearly the whole of the above 153\* cases of poisoning might have been prevented by the existence of stringent legal enactments forbidding the retail sale of poisonous drugs to non-professional persons:—and (2) that such regulations would, if duly carried out, unquestionably have prevented the whole of the 19 deaths from opium, the 26 from arsenic, the 3 from oxalic acid, and the remaining 2 from prussic acid; as it is evident from the nature of the occupations of the individuals who destroyed themselves that they must have procured the poisons from druggists, on shallow and inadmissible pretences.†

The unwise and destructive custom which permits retail druggists to keep large quantities of deadly poisons—*not employed in medicine*—in their shops, and to sell these poisons merely under restrictions which any bold and artful criminal may readily elude, has been so frequently commented upon in the public prints, that every individual in the

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\* We omit the 7 instances of suicide by medical men, as well as that by the druggist, as it is evident that no legislative measure can check this kind of suicide among persons engaged in compounding of drugs.

† In illustration of this opinion, we may give the occupations of the 26 persons who poisoned themselves with arsenic: Labourers, 4; Shopkeeper, 1; Milkman, 1; Artizan, 1; Clerk, 1; Milliner, 1; Domestic servants (female), 5; Sailor's Wife, 1; Widow, 1; Spinsters, 4; Occupations not specified, 2; Labourer's Daughter, 1; Daughters of persons not engaged in the sale of drugs, 4. It is evident that, with the exception of the Labourers and the Labourer's Daughter, who *may* have been agriculturists, and *may* have had access to arsenic employed in the dressing of seed-corn, and of the Artizan, who *may*, possibly, have used arsenic in his trade, the whole of these individuals must have procured the poison surreptitiously from retail druggists.



country must have become aware of the dangerous tendency of this practice. Still, only partial measures have been taken by the Legislature to put a stop to the deadly traffic, and examples of its fatal results are still rife throughout the country.

Every druggist in the United Kingdom has exposed for sale in his shop a considerable quantity of at least three most deadly poisons; neither of which, by any chance, ever finds a place in any medical prescription, or is, in reality, necessary in any form of medical treatment:—these are Oxalic Acid, Oil of Bitter Almonds, and Arsenious Acid.\* Upon the most trivial excuse, and for a very small sum, any person may procure a quantity of the first or second of these poisons sufficient to destroy the lives of an entire family: while, as we have already hinted, the law has not yet placed the third absolutely beyond the reach of guilty ingenuity.

It is a plain and indisputable fact that the only uses for which retail druggists can sell either one or the other poisons to non-professional persons are the following:—

<i>To destroy rats, or other vermin; also the fly in sheep; for dressing of seed corn: for the preparation of certain colours; and the manufacture of stearine candles;† and in type founding, as well as, occasionally, in the preparation of specimens of natural history.</i>	Arsenious Acid.	FOR THE PURPOSE OF DESTROYING HUMAN LIFE.
<i>To clean boot-tops, brass, harness, and straw-bonnets.</i>	Oxalic Acid.	
<i>To flavour confectionery, and to perfume hair-oils, and soap.</i>	Essential Oil of Bitter Almonds.	

If long habit, and a reckless spirit of disregard for the dangers which beset others, had not taken deep root in the public mind, it would have been thought utterly impossible that, in enlightened England, in the middle of the nine-

\* It will be seen that the preparation of arsenial solution for medical uses needs form no exception to this rule.

† The generality of manufacturers find that its use may be dispensed with in the preparation of the candles.



teenth century, the customs of destroying vermin in a particular and filthy manner, of giving a glossy appearance to some trifling articles of human and equine apparel, and of imparting a peculiar taste to certain viands,—at the peril of the eaters' lives,—should have become the means of giving facility to the sudden and violent deaths of a scarcely varying annual average of suicides and murdered persons.

The words "arsenic to poison rats" might long since have been stereotyped for continual use in reports of cases of suicide and murder. By what right or necessity persons of all ages, sexes, and conditions, should have been allowed, up to the commencement of the second half of the present century, to purchase for a few pence an agent which is, in reality, of no actual use whatever, and which was, when so purchased, almost invariably employed in the destruction of human life, it is quite impossible to understand. It appears as if it had become, from time immemorial, part of the *lex non scripta* of the land, that the destruction of rats by one expedient, and by that only, was a result so desirable, that rather than disturb the consummation of an object for which society had long endured to render a heavy tax of lives, an indefinite amount of devilish crime, and of death in its most appalling and unnatural form, was to be tacitly sanctioned amongst us!

A comparison of the following passages—the first being in the words of a popular writer of the fourteenth century, the other being taken from the details of certain instances of suicide and murder which have occurred of late years, will shew how deeply-rooted the practice of this antique iniquity has become:—

#### XIV. CENTURY.

"And forth he goth, no longer wold he tary,  
Into the town unto a poticary.  
And praied him that he him wolde sell,  
Some poison that *he might his ratouns kill*;  
And eke there wal a polcat in his heme.  
And fayn he wolde him wreken if he might,  
Of vermine that destroyed him at night."

(*Chaucer's Pardounour's Tale.*)

#### XIX. CENTURY.

"She purchased one penny-worth of Arsenious Acid, 'for the purpose,' she said, 'of destroying rats.'"

"He swallowed half an ounce of Arsenious Acid (purchased) upon the usual pretext of *killing rats*."  
—*Northern Jour. of Medicine*, Novr., 1845.

"She stated that she had procured poison twice for the purpose" (of poisoning her mother, her four brothers, and two other persons). "She had procured it, on both occasions, by saying



that she *wanted it for the destruction of rats*."—*Med. Gazette*, June, 1846.

"She was proved to have gone to one shop to buy poison, under the pretence of *destroying rats*; and, at another, where she succeeded in procuring an ounce, she stated that it was for *destroying bugs*."—*Ibid*, August, 1847.

"She said that, knowing where her master kept arsenic *for the destruction of rats*, she had taken and put it into the milk."—*Report of a Trial at Nemours*, in July, 1851.

"He added that it was he who had furnished arsenic to Paris (the murderer), who said *he wanted it to poison rats*. This witness kept arsenic by him, using it occasionally for diseases of his sheep."—*Report of a trial at Aube*. August, 1851.

Within the four centuries which have elapsed between the inditing of the above sentences, hundreds of human lives have been destroyed upon the same villainous pretext. We perceive how feeble the, at first sight, stringent laws of France are in quashing it. Whether the less absolute English enactment of 1851 will exercise a stronger control over it, is a question which can scarcely be asked, without dreading the probable reply which a few years' trial will afford.\*

The law regulating the sale of Arsenic, which has lately come into operation, provides that, when any preparation of this mineral is sold, the particulars of sale are to be entered in a book kept by the seller, in a form set forth in the schedule, containing the date of sale, the name and surname of the

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\* To the record of suicides which we have cited above, as occurring in England and Wales during 1840, a fearful list of instances where death arose from the accidental administration of poison must be added; 188 lives were thus sacrificed. Of these, 39 were children destroyed by over-doses of opium; 15 died from the effects of oil of vitriol taken by mistake; and 8 from the action of other poisons, which must, in every case, have been procured from druggists. In the remaining cases, the precise mode of poisoning was not given in the return, but it is probable that only a very small proportion of these deaths resulted from the action of vegetable poisons taken by mistake as food.



purchaser, his place of abode and occupation, the quantity sold, and the purpose for which it is required. If the buyer is personally unknown to the seller, the sale must take place in the presence of a witness; a witness is also required where the buyer is unable to write. Arsenic is not to be sold except to a person of full age. Chemists are required to colour arsenic with indigo or soot, to prevent its being mistaken for a harmless substance; except where it is sold in large quantities, or in medicinal preparations. Breaches of this Act are to be punished by Justices, who are empowered to inflict a penalty not exceeding £20. This law is confessedly merely expected to place a check upon the sale of a single poison very commonly in use in England. The most essential of its provisions correspond precisely with those which were suggested in a petition addressed to Parliament by the members of the Provincial Medical and Surgical Association; the measure must therefore be regarded as based upon high medical authority; still, it is extremely questionable whether it will in any material degree restrain arsenical poisoning; and even should it prove sufficient to do so altogether, it will only place a partial check upon crime.\* Neither can we overlook the probability that other poisonous agents will, in future, be chosen by those who contemplate suicide or murder.† The objections which have, from time to time, been thrown in the way of proposals for a very stringent law, prohibiting the retail sale of any description of poison by druggists and other dealers, have certainly been of a very insufficient character; in reality, they have merely set forth certain difficulties, and inconvenient contingencies, as the inadmissi-

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\* The Registrar-General's Report for the summer quarter, ending September 30th, 1851, shews that in London the deaths by poison, in the summer quarters of 1848-50, were 15, 2, 26; and that they were only 10 in the summer of 1851. The Registrar-General observes that "this decrease is highly gratifying, as it follows so immediately the recent legislation on the subject." The grounds for congratulation, however, appear to be somewhat unsubstantial at present.

† The members of the Provincial Medical and Surgical Association stated, in their petition dated the 2nd August, 1849, that "more than one-third of the fatal cases of poisoning in England are occasioned by arsenic, and that in the years 1837-38, there were 185 such cases." Out of 496 cases of assassination by poison which occurred in France during the six years preceding 1847, arsenic was employed in 352, (*Annales d'Hygiène Publique*, ut supra citat.) It is stated in the *Medical Gazette*, that "from a Parliamentary Return made a few years since, it appears that out of 474 ascertained deaths from poison in England and Wales, during a period of two years, there were,—from Opium and its preparations, 196; from Arsenic, 185; from Sulphuric Acid, 32; Prussic Acid, 27; Oxalic Acid, 19; Corrosive Sublimate and Mercury, 15; and Oil of Bitter Almonds, 4.



ble alternatives of a monstrous and destructive evil. Thus, it has been contended that it is extremely difficult to establish a clear definition of the word "Poison," or to draw out a satisfactory list of poisonous agents; that proper substitutes cannot be found for certain poisons; that trade and the arts would be interfered with by extensive prohibitory measures; and, that the setting forth the names of various poisons in the schedule of a Parliamentary Bill, would be likely to produce more harm than good, by enabling persons to have recourse to other poisons than those now used to destroy human life.

In answer to these objections, it may be shewn that the word "Poison," although in itself somewhat indefinite, becomes expressive enough when applied to certain stated chemical and vegetable substances. It may, undoubtedly, be difficult to include in any list all those agents which are capable of destroying life when taken internally, seeing that the contents of a blacking bottle, or a few ounces of gunpowder, or a certain quantity of tobacco would, in reality, prove nearly as destructive a dose as anything that could be purchased under the name of a poison; still, a list might be readily drawn out, which would include every kind of chemical, animal, and vegetable substance that can be fairly regarded as poisonous in its nature, or that is known to have been used successfully with a murderous or suicidal intention. Any deficiencies of practical moment, which might be discovered hereafter in this list, could be readily supplied, and defects that remained permanent should scarcely be viewed with regret;—the Law, having removed from the reach of evil-intentioned persons all ordinary kinds of poison, will have done its utmost, and will have freed its authors from responsibility in the matter. Crime is not readily baffled in accomplishing its ends;—the Law, of course, fulfils its obligations by rendering the means of encompassing those ends as unattainable as possible. With regard to any embarrassment which would result from stringent regulations prohibiting the retail sale of poisons, it may be taken as a general principle, open to scarcely any conceivable exception, that the substances of a poisonous nature which are at present required in manufactures, and in the arts, need never be vended by *retail* dealers; they are all of a kind which might, without any disadvantage, be sold exclusively by wholesale merchants, licensed to transact such sale, to buyers also furnished with licenses to purchase certain of the articles in question, and subject to very heavy penalties if found guilty of employing those arti-



cles incautiously. In this manner, House-painters, Type-founders, Dyers, Gunpowder-manufacturers, Firework-makers, Artists, Bleachers, Druggists, and Apothecaries, and others, might be fully provided with any deleterious substance which they might require in their operations, with the least possible risk of danger to the community at large. There are certainly three poisons the preparation and sale of which might, with a slight reservation, be absolutely interdicted, without the infliction of any loss or injury whatever to any class of individuals:—these are Arsenic, Oxalic Acid, and Barytes. It is very singular that the use to which the different forms of arsenic are occasionally put, have always been successfully urged against the interdiction of its sale to non-medical persons. We have already seen that the uses of this mineral are by no means numerous. The report of M. Cunin Gridaines, Minister of Agriculture and Trade, sent in previous to the establishment of a restrictive law in France, in 1846, shews that arsenic, when employed in the dressing of wheat, may destroy any animalcula existing in the seed-corn, but that it is quite inert as regards the prevention of smut, or uredo,—while it is found that a mixture of lime and sulphate of soda at once destroys the vegetable and animal organisms which are found in seed-corn, and favor vegetation.\*

At present, the sale and employment of arsenic for the purpose of dressing seed-corn, as well as for the destruction of insects, and for the embalming of dead bodies, is absolutely prohibited in France: the adoption of a similar regulation in England is greatly to be desired, as most serious results undoubtedly occur from the former practice.† With regard to

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\* *London Medical Gazette.*

† In November, 1848, twelve persons, residing at Feltwell and Hockwold, were poisoned in consequence of three bushels of wheat having been by mistake put into a sack containing a bushel of wheat which had been dressed with arsenic for seed. It is remarkable that, after this poisoned batch of wheat had been ground, sufficient arsenic was left in the stones of the mill to contaminate a second and a third batch of corn; the accident was then fortunately discovered. The only person who died was one of those who partook of a pudding made from the *third* batch. The *Medical Gazette*, for December 15th, 1848, contains a very interesting and important letter from Dr. W. A. Fuller, on the poisoning of partridges and pheasants from feeding on recently sown grain, which had been steeped in a solution of arsenic with a view of preventing the ravages of the wire-worm, and the developement of smut. It is here stated that, from 1830 to 1840, there occurred in France 235 public accusations of poisoning, out of which number 110 were against individuals connected with agricultural pursuits; and it was considered that this arose from the readiness with which such persons were enabled to obtain poison for the purpose of steeping grain.



its employment in medicine, arsenic is certainly a remedy of considerable value ;—still, a single licensed dealer might prepare and supply as much of the solution as is required in the United Kingdom and in the colonies ; and even if that appeared objectionable, our *Materia Medica* is not so poor but that we could afford altogether to resign this medicinal agent. The difficulty, then, resolves itself into a small compass. The French Committee decided that no good substitute for arsenic had yet been discovered as a means of destroying vermin ; they, therefore, recommended that, until the attainment of this desirable end, the sale of arsenic, in its pure and natural state alone, should be prohibited ! Here then is a plain question of economical expediency. So many thousand rats destroy so many thousand quarters of wheat, &c., annually. This evil must either be imperfectly checked by improving our drains and sewers, and by calling in the aid of terriers, ferrets, and cunningly contrived traps, or it must be somewhat more effectually restrained by the yearly sacrifice of so many scores of human lives ;—by the cutting off of so many innocent persons, stricken down, without hope or respite, while vitality is strongest within them, by a death more torturing than the death at the stake ; and at the still more fearful price of the public execution of an equal number of beings stamped with the features of humanity, but whom the command of God and the laws of man have alike placed beyond its exercise.\* Assuredly, in these peaceful times, Europe has no foes so cruel or so deadly as the Rats.

With regard to Oxalic Acid and Barytes :—the first of these poisons has never been employed in medicine ; and

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\* Every imaginable severity has been menaced by the laws, and inflicted in vain, with a hope of deterring criminals from the commission of this enormity. Chamberlayne mentions, in his *Angliæ Notitia*, that "Impoysonments, so ordinary in Italy, are so abominable among English, as 21 Hen. VIII., it was made high treason, though since repealed ; after which the punishment for it was to be put alive in a caldron of water, and there boiled to death"—*Howe's Chronicle* records the facts thus ;—on the 5th of April, 1532, one "Richard Rose, a cooke, was boiled in Smithfield, for poisoning of divers persons, to the number sixteen or more, at the Bishop of Rochester's place." And that on the 17th March, 1542, "Margaret Davy, a maid, was boiled in Smithfield for poisoning of three households that shee had dwelled in." In 1588 Brillard was torn to pieces by horses for poisoning the Prince of Condé ; and, in 1676, the Marchioness de Brinvilliers was beheaded at the Greve, and her body burned to ashes and scattered to the winds, while her infamous agent and accomplice was broken limb by limb on the wheel. Until the year 1790, the crime of poisoning a husband was accounted petty treason, and was punished by strangling and burning ; indeed the law, which was repealed in that year, directed that such poisoners should be burned alive.



the second is of no medicinal value—while the other uses of both are of the most utterly trivial description. Lastly, it appears as improbable, considering how generally every kind of good and evil knowledge is now diffused, that an intending criminal should gain aid in his nefarious designs from discovering the names of certain poisons in the schedule of an Act of Parliament, as it is that he should gather encouragement from the fact, that the very list which he peruses stands there as the instrument by which the execution of his designs will, in all probability, be embarrassed or frustrated.

It would appear, then, that the establishment of the following restrictions would go far to strike at the root of this national evil.

The preparation of a list of Poisonous Drugs by the regulating medical bodies of the three kingdoms.

The preparation of lists of Poisonous Substances employed in the Arts by scientific men chosen for the purpose.

The establishment of a rule compelling all importers and manufacturers of poisonous drugs and chemical materials, as well as all wholesale druggists, colour-men, dye-stuff sellers, &c., to take out licenses\* for the importation or manufacture and sale of the various substances specified in their several licenses, exclusively to persons licensed to purchase those articles. Infractions of this law to be punished by heavy fine and withdrawal of license.

The authorising of all retail druggists, apothecaries, manufacturers, agriculturists, artists,† and other persons, requiring to be furnished with poisonous substances, to purchase such materials only by the possession of a license in which the articles purchaseable shall be severally enumerated. Persons thus licensed being responsible for the safe custody of the poisonous articles obtained on the authority of their license, and all breaches of this responsibility being punishable by fine and withdrawal of the license. The infliction of fine and imprisonment upon all persons found guilty of the importation, manufacture, sale, or possession, of arsenic,

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\* The expense of procuring such licenses need not be fixed at a high rate. They should be granted by Justices of the Peace upon clear proof that the parties requiring them resided in the neighbourhood, and were actually engaged in the trades or occupations specified; the Justices being empowered to withhold licenses whenever the applications should appear to be unsatisfactory. All such licenses should be renewed yearly.

† There appears to be no valid objection to the unrestrained sale of prepared colours for the use of artists, but a large proportion of the unground pigments should be procurable only by the holders of licenses.



oxalic acid, and barytes, or of their poisonous salts or compounds;—except only in the case of the Apothecaries' Company of London, who might be permitted to procure and keep arsenious acid for the preparation of the medicinal solution, which should be procurable only by druggists and apothecaries, at home and in the colonies.

The enforcement of a rule that druggists licensed to retail poisonous drugs should be permitted to do so only upon medical prescription, under penalties of the withdrawal of license, fine, and imprisonment.\*

Since the year 1682 legal measures have existed for the restriction of the sale of poisons in France; and in 1846, the ordinance upon this subject was revised and strengthened. The lists of poisons which have been given in the Act are, however, far from complete, and the regulations laid down are by no means sufficiently restrictive.† The statistics already cited in this chapter prove that assassination and suicide by poison are by no means rare crimes in France.‡ It is certainly only by the establishment of rules of almost proscriptive severity that the progress of this enormous evil can anywhere meet with a valid check.

There is one department of this subject which demands the gravest consideration:—the unrestrained sale of opium in England, with its calamitous results, the daily increase

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\* It would be a substantial benefit to humanity if this rule could be made to involve the prohibition of the sale of a large proportion of patent and quack medicines. This good result, however, is probably not attainable at present. Compounds of this class might be sold as upon medical prescription, their proprietors being, in all instances, under the necessity of taking out licenses for the purchase of their poisonous ingredients, and being liable to the withdrawal of their licenses, fine, imprisonment, &c., should their preparations be discovered by analysis to contain improper doses of those drugs. This rule would go far to place a check upon the dangerous practice of prescribing now very generally exercised by mere druggists—especially as regards the sale of opium. These rules need not, however, bar the unrestricted sale to persons unfurnished with medical prescriptions of a large number of very useful medicines, aperients, diaphoretics, tonics, &c., &c. It is mentioned in a recent number of the *Pharmaceutical Journal*, that in Sweden there is a law forbidding the sale of poisons or other powerful medicines without a sufficient prescription, which is retained by the chemist, and which must not be repeated without a note from the physician. It is stated that poisoning is, consequently, very rare in Sweden; and, when practised, it is commonly by means of white arsenic, which has probably been obtained from a glass manufactory.

† See an interesting sketch of these laws, *Lond. Med. Gazette*, May 24th, and June 7, 1850.

‡ As lately as September, 1847, it was reported that several druggists in France had been fined and condemned to the payment of costs of prosecution, for having sold poisons to the public without a register, and for not keeping poisonous substances under lock and key.



of the eastern vice of opium-eating; and the extensive sacrifice of infant life by the ignorant and unprincipled use of "Soothing Syrups," "Quietness," and other like diabolical preparations. The second of these subjects must be reserved for a subsequent chapter. With regard to the first, it appears from the accounts of the Board of Trade that the total quantity of opium consumed in the United Kingdom in the first half of the year 1846, was 9,300 lbs.; in the first half of 1847 it was 27,208 lbs.\* while, in the corresponding period of 1848, it was 36,985 lbs. This vast increase in the consumption of opium has been attributed in a certain degree to the extension of the temperance system. This is doubtless in some measure the case, although we do not find a proportionate diminution in the sale of intoxicating liquors. The advocates of temperance wholly reject this opinion,—still the matter is one in which they are not responsible, and which in no degree invalidates the importance of their rules. Upon whatever causes it may depend, this baneful practice is acknowledged to be one of great and daily augmenting prevalence, especially in large manufacturing towns, and in the Fen-Districts; and there can be no reason whatever to doubt that, in England, it is attended with results as injurious as those which we shall hereafter find to be its almost invariable accompaniments in the East. Fortunately, its absolute restriction by a stringent legislative enactment, appears to be attended with none of those difficulties which lie in the way of the suppression of intoxication by spirituous liquors.†

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\* Another account gives the total quantity of opium *imported* in 1847 as amounting only to 24,929 pounds. It is, however, possible that the quantity *consumed* that year may have exceeded that imported.

† At present the prevention of the indiscriminate sale of opium and its preparations is rendered difficult chiefly by the practice of opium-eating; we have already seen that the numbers of deaths from poisoning by opiates falls little, if at all, short of those by arsenic; indeed, a large proportion of suicides select laudanum, with a very mistaken belief that its deadly effects are painless. In February, 1852, an unhappy girl of eighteen was brought before one of the London Magistrates charged with a determined attempt at self-destruction. She first took three-pennyworth of laudanum, and afterwards four-pennyworth. She was, however, recovered at St. George's Hospital. This is almost one of the daily events of London; where tooth-ache, lumbago, and opium-eating are allowed as reasons for selling this drug to strangers. Neither the scruples of the conscientious druggist, nor the double cautiousness of those who merely give one penny-worth for fourpence to suspicious customers, will ever avail to save the lives of wretches determined upon suicide. No person should be permitted to obtain any form of opium except upon a medical prescription or certificate. A document of the latter kind could always be obtained by habitual opium-eaters.



XIV. *The Suppression of all those Trades which, while they produce no substantial Benefit to the Community at large, entail almost certain Destruction of Life or Health upon those who practise them ; and the careful Modification of those useful Trades or Occupations which are attended with Danger to Health or Risk of Life.*

One of the greatest defects in the social system of countries where excessive luxury and indomitable industry are alike national characteristics, lies in the fact that there are no tasks so miserably poor, or so absolutely destructive, whether to the moral or to the physical health of the individuals employed upon them, but that there will be found multitudes of unfortunates who will eagerly volunteer to undertake them, and contend vigorously with each other for their attainment. Let an advertisement appear requiring the services of a public executioner who shall hang systematically and scientifically at the rate of five pounds per head ;—or, in all respect and with much regret be it spoken, for an university scholar, or an accomplished lady, who will perform all the drudgery of a school-assistant's duties for some twelve or twenty pounds a year ;—a crowd of capable and willing applicants will at once present themselves. In like manner, every independent occupation, however hurtful or revolting, is over-stocked with workmen, apprentices, and candidates. The Sewer-prowler, the Nightman, the Chimney-sweeper, the Chiffonnier, the Rat-catcher, the Knacker, and a host of others whose occupations fall infinitely below these, in adding every degree of moral turpitude to the extreme of physical degradation, are nearly as inseparable from our chief cities as are the great trading and professional bodies.\*

\* Mr. Chadwick mentions in his Report that there are upwards of 2,000 of the chiffonniers alone in Paris, and that they and the water-carriers were conspicuous actors in the Revolution of 1830. At the out-break of the Cholera of 1834, the attention of the authorities was directed to sanitary measures, and an attempt was made to remove the street dirt by a quick relay of carts, lighter and better adapted than those previously in use. "But, in this arrangement," continues Mr. Chadwick, "an important interest had been overlooked :—the chiffonniers, who were said to have been aided and directed by the owners and men belonging to the superseded vehicles, rose in revolt, attacked and drove away the conductors, broke to pieces the new carts, threw the fragments into the river, or made bonfires with them. Unfortunately, at that time the cholera had broken out at Paris. The mobs of chiffonniers, which collected on the following day, were swollen by other crowds of ignorant, terrified, and savage people, who were persuaded that the deaths from the strange plague were occasioned by poison. 'My agents,' says the then Prefect of Police, in an account of this revolt, 'could not be at all points at once to oppose the fury of those crowds of men with naked arms and haggard



In this class of social evils there may be much that is inevitable; still, although the moral and political defects which bring them into operation, or result from them, do not lie immediately within our control, they are by no means beyond all hopes of palliation; while the physical ills which attend them are, in many cases, fairly open to prevention or removal. Emigration, the undertaking of great national works, giving occupation to multitudes of active hands, and the accomplishment of the cleansing of cities upon extended scientific systems, will, it may be trusted, in a few years, tend nearly to remove from among us those occupations, the degrading filthiness, unwholesomeness, and morally debasing tendencies of which, render them a hundred degrees worse than the toils of unmitigated slavery,—inasmuch as the slave-owner values the health of his slave as a costly portion of his own property, and guards it accordingly—while there are thousands of wretches in our large cities who daily barter a certain amount of their constitutional energy, and so many weeks or months of the existence which might otherwise have been granted to them, in exchange for a scanty portion of daily food. There is no actively-worked steam-engine in any one of our manufacturing marts, that is not daily cleansed and oiled and tended with the most scrupulous and delicate care;—but there are, in each of those towns, thousands of human machines, set in motion by the breath of life

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figures, and sinister looks, who are never seen in ordinary times, and who seemed on this day to have arisen out of the earth. Wishing to judge myself of the foundation of the alarming reports that were brought to me, I went out alone, and on foot. I had great difficulty in getting through these dense masses, scarcely covered with filthy rags: no description could convey their hideous aspect, or the sensation of terror which the hoarse and ferocious cries created. Although I am not easily moved, I at one time feared for the safety of Paris—of honest people and their property.' In fact, the riot was one of the most dangerous that had been witnessed in the city, and it was not suppressed without great exertions, and some loss of life. The anxieties which it occasioned to the minister, Casimir Perrier, and his disgust at the political use made of it, were considered to have contributed to his death. He was himself attacked with the Cholera, and died a few days after. Shortly before his death, when expressing his disgust, he said to the prefect, 'My friend, we are harnessed to a vile carriage.' 'Truly so,' replied the prefect, 'and the ways are dreadfully dirty.' " Up to the present time, therefore, the streets of Paris are as dirty as ever, and the chiffonniers remain in the ascendant,—or rather continue prepared to rise at any moment. Mr. Chadwick finds that of the class of bone-pickers, mud-rakers, people living on the produce of dung-heaps in mews, courts, yards, and by-lanes insufficiently cleansed, 598 are known to the police. He believes from facts stated, that were the refuse of houses daily cast into the streets of London in the same manner as at Paris, London would soon have as large and as dangerous a population of the chiffonnier class.



breathed into their nostrils by God himself, which are never tended either by themselves or by others, never cleansed, never regulated, never sufficiently fed, and scarcely even subjected to repair;—until shattered and worn out, they are cast aside, and pass from existence in those lumber warehouses of great cities,—the unions and public hospitals.

These evils are scarcely to be laid to the charge of any class; neither are they to be removed by the irrational vociferations of Chartists, nor by the machinations of those who would fain compel the rich and the learned to become hewers of wood and drawers of water, and seat the knave in the knight's stall;—but it is in the power of a wise and just Government to alleviate such ills materially; and day by day our own legislature is working out somewhat towards this good and needful end. Thanks to the energy and humanity of Sydney Smith, that inhuman practice, the use of climbing-boys, has long been interdicted in London; the employment of women and of children under ten years of age for draught-work in mines has also been put an end to by the exertions of that thorough friend to the English poor—the Earl of Shaftesbury; and, since the time of Davy, men of science and physicians have combined in endeavours to guard manufacturing labourers against most of the removable injurious influences attendant upon their occupations. Still, very much has yet to be achieved in this respect; the days of the artizan class are still few and evil, and deadly blight hangs alike over their minds and their bodies;—immoral and factious, puny and diseased, it is not singular that this unfortunate race should burthen the country with multitudes of bad citizens and inefficient servants.\*

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\* The following sentences from the *Sanitary Report* (in *The Sanitary Economy*) are fraught with terrible meaning—"Whenever the adult population of a physically-depressed district, such as Manchester, is brought out on any public occasion, the preponderance of youth in the crowd, and the small proportion of aged, or even of the middle-aged amongst them, is apt to strike those who have seen assemblages of the working population of other districts more favourably situated. In the course of some enquiries under the Constabulary Force Commission as to the proportions of a paid force that would apparently be requisite for the protection of the peace in the manufacturing districts, reference was made to the meetings held by torch-light in the neighbourhood of Manchester. It was reported to us, on close observation by peace-officers, that the bulk of the assemblages consisted of mere boys, and that there were scarcely any men of mature age to be seen amongst them. Those of mature age and experience, it was stated, generally disapproved of the proceedings of the meetings, as injurious to the working classes themselves. These older men, we were assured by their employers, were intelligent, and perceived that capital, and large capital, was not the means of their depression; but of their steady and abundant support. They were generally described



A few only of the more injurious occupations followed in England can be brought under consideration within our limited space. One of the most destructive trades is that of Gilding by Heat. In this operation, gold is reduced to an amalgam with fluid mercury; this composition is applied over the metal article requiring gilding, the heat of a small furnace is then employed, the mercury is volatilized, flying off in an intensely poisonous vapour, and the gold remains fixed. In course of time, the inhalation of this mercurial vapour almost inevitably produces a most distressing kind of paralytic affection known by the workmen as the "trembles." Those who abandon their employment early, or soon after the commencement of the disease, occasionally escape or recover,—but what handicraftsman can exist without his employment? A few years' practice of this trade is usually sufficient to damage the constitution irreparably. Fortunately but few men are employed in this work, and there are

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as being above the influence of the anarchical fallacies which appeared to sway those wild and really dangerous assemblages. The enquiry which arose upon such statements was, how it happened that the men of mature age, feeling their own best interests injured by the proceedings of the younger portion of the working classes, how they, the elders, did not exercise a restraining influence upon their less-experienced fellow-workmen? On inquiring of the owner of some extensive manufacturing property, on which between 1,000 and 2,000 persons were maintained at wages yielding 40s. per week per family, whether he could rely on the aid of the men of mature age for the protection of the capital which furnished them the means of subsistence? he stated he could rely on them confidently. But, on ascertaining the number qualified for service as special constables, the gloomy fact became apparent, that the proportion of men of strength, and of mature age for such service, were but as a small group against a large crowd; and that for any social influence they were equally weak. The disappearance by premature deaths of the heads of families and the older workmen, at such ages as those recorded in the Returns of dependent widowhood and orphanage, must, to some extent, practically involve the necessity of supplying the lapse of staid influence amidst a young population by one description or other of precautionary force." A similar preponderance of the young,—if he can

"be young, that's feeble, weak and wan"

is remarked in London mobs:—"the constant reports of the Superintendents is, that scarcely any old men are to be seen amongst them." Further, it is remarked that, "in general, the juvenile delinquents who come from the inferior districts of the towns, are conspicuously under size. In a recent examination of juvenile delinquents at Parkhurst, by Mr. Kay Shuttleworth, the great majority were found to be deficient in physical organisation. An impression is often prevalent that the criminal population consists of persons of the greatest physical strength. Instances of criminals of great strength certainly do occur; but speaking from observation of the adult prisoners from the towns, and the convicts in the hulks, they are in general below the average standard of height." Mr. Chadwick mentions that of 613 men enlisted at Birmingham and the neighbouring towns, only 238 were approved for service.



means by which the injurious operation of the mercurial fumes may be prevented; still, it is to be trusted that the introduction of electro-plating will soon remove all necessity for the use of mercury in gilding.

Within the last twenty years another more useful, but certainly very dangerous trade,—the manufacture of Lucifer Matches,—has come into extensive operation.\*

After this manufacture had been some years in operation, it became a matter of notoriety, on the continent, that persons engaged in it were liable to suffer severely from pulmonary attacks, and to be still more grievously affected with disease of the bones of the upper and lower jaw, the gums ulcerating and separating from the teeth; and, in not a few instances, the entire thickness of the maxillary bones becoming gradually detached with the utmost suffering; and, not very unfrequently, to the sacrifice of the patients' lives:—these consequences being evidently due to the action of phosphorus fumes. It was at first argued that such unfortunate results occurred only in persons who had been employed in Lucifer match making for many years, or who were otherwise liable to disease of the gums, or who were of strumous constitution.† These were by no means satisfactory arguments, inasmuch as slow poisoning is not by many degrees preferable to sudden death, and seeing that spontaneous disease of the gums, involving the maxillary bones, is not a very common malady; while scrofula threatens every individual who is ill-fed and spends much of his time in a vitiated atmosphere.‡ According to Dr. Balfour, the

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\* According to Chambers, we learn from the Report of a Parliamentary Commission in 1845, that the consumption of this sort of matches was more than five billions a year, and that one man in London, who made the wooden boxes to contain them, paid a thousand a year for timber for that purpose; thus really deserving the designation which had been applied to his predecessors in the trade in jest—that of an extensive “timber merchant.” Besides the vast quantities of Lucifers manufactured in England, uncounted numbers of them are imported from the banks of the Rhine, and various other parts of Germany. The wood is floated down the river from the thick pine-forests, and the small branches and waste wood are made into matches in various villages on the banks, and sent over to America and to all parts of Europe.

† Recently, Dr. Ebel (in *Casper's Wochenschrift*, as quoted in *Med. Gazette* for November, 1851) argues that the vapour of phosphorus exerts no specially injurious influence on the health of the work-people; that it neither originates nor favors the production of necrosis, even where a morbid condition of the teeth exists; and that the disease, in most cases, must be attributed to other causes,—as scrofulous, ricketty, and cachectic constitutions, and to rheumatism. These opinions are, however, opposed by those of Lorinser, Jünken, Heyfelden, and many other able observers.

‡ Dr. Balfour states in a paper on this subject, published in the *Northern Journal of Medicine*, that almost all the girls employed in the Lucifer



Austrian Government were by no means tardy in ordering the observance of sanitary and prophylactic means, such as—directing that, in addition to the observance of scrupulous cleanliness, the matches should not be dried in the work-rooms, but, if possible, in an upper storey ; that, every second hour the girls should be obliged to wash their mouths with acidulated water (a practice, however, which could not fail to tell severely upon the enamel of the teeth in the course of ten or twelve years) ; and that they should be sent away twice daily to take their meals, and for the benefit of some fresh air. Still, the evil continues up to the present time, although perhaps in a somewhat moderated degree. The disease “Phosphoric Necrosis,” or P. Periostitis, has now taken a place not among “the ills that flesh is heir to,”—but in association with those which man has created, and regards philosophically as—“necessary evils.”

*The Prevention of Pulmonary Consumption* is one of the most important subjects that can engage the attention of practical physicians ; but if, in any degree, this inestimable good can ever be achieved, others than physicians must lend their utmost energies to the task.

It has been argued with great probability, that nearly four-sixths of the deaths which occur in England from chronic or lingering diseases, result from Pulmonary Consumption—all other diseases of the chest being placed entirely aside—

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manufactories at Vienna have the gums more or less affected, with a red ulcerated line at their junction with the teeth, like that produced by mercurial salivation. Dr. Balfour mentions that the process of drying the matches, after they have been dipped in the phosphoric mixture, is carried on in ill-ventilated rooms. The girls who work in the factories pass from twelve to fourteen hours daily in those rooms, exposed to excessive heat, and to the constant action of phosphoric fumes. From three to four pounds of phosphorus are daily used in the manufacture of from one to two millions of matches, the mere drying of which must give no inconsiderable quantity of phosphoric fumes, to which also must be added the quantity of metaphosphoric acid produced by burning the sundry parcels which, in spite of care, is no unfrequent occurrence. No cases were observed at Vienna until the manufactories had been at work upwards of eleven years. Scrofulous subjects suffer most, and in them the disease is most fatal. When the individual is robust, and the necrosis confined to a small portion of the bone, separation takes place, and a gradual cure follows ; but when there exists any tendency to scrofula, phthisis becomes developed, and death inevitably follows. Geist, as quoted by Dr. Ebel, stated the number of cases in the Vienna, Nüremberg, and Berlin factories to be sixty-eight, of which five were males, and the rest females, and nearly all between twenty and thirty years of age. Of these, fifteen recovered, fifteen died, and fifteen were at the time under treatment : of twenty-three, the result was not known. In 23 the disease was in the upper, and in 26 in the lower jaw. In 5 cases both bones were diseased.



and that, as the duration of the disease, taking one case with another, is about two years, we may conclude that about 72,000 persons are constantly suffering from Phthisis in the country; while out of the 45,000 deaths which occur annually in the Metropolis, about 5,600 are attributable to this destructive malady.\* Mr. Farre shews that, in 1838, the deaths from Phthisis, in England and Wales, amounted to 16·033 per cent. of the total deaths from all causes among males, and to 19·194 among females. Still, Mr. B. Phillips has found, by a comparison of fifteen different countries in the four quarters of the world, that there is no European country, at least in so far as our information extends, in which the people are more free from the disease than England and Wales; and that it is much less prevalent in the present day than it was in the 17th and 18th centuries.† The disproportion between the number of deaths from Consumption in town and country districts is not so striking as we find it to be in the case of Epidemic diseases. Still it is very considerable. In 1838, Mr. Farre calculated that for 1·00 who died of Phthisis in the country, the number of fatal cases in the town might be given as 1·24. A few years later, Dr. Guy gave the relative proportion of scrofulous diseases and consumptions as 3,800 in town, to 4,600 in the country.‡

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\* *Fourth Report of the London Hospital for Consumption and Diseases of the Chest.* Dr. Guy, however, gives 2,500 annual deaths from Pulmonary Consumption, in the Metropolis, as resulting from deficient ventilation. Dr. Winslow cites  $4\frac{3}{10}$  per 1000 (living) as the rate of mortality from Phthisis in the Metropolis. Mr. Simon considers that about one-fourth of the deaths occurring in the city proper result from Consumption and other strumous diseases (*Report for 1851*).

† *The Sanitary Movement.* It is elsewhere stated that, in 1799, the deaths from this cause in London were 1 in 3·8; and that, in 1808, they were 1 in 3·6.

‡ The statistics of this disease on the continent are remarkably striking. M. Journée finds that, in Leghorn, there is 1 phthisical patient to 44 attacked by other diseases. In Florence 1 to 28; in Rome, 1 to 20; in Naples, 1 to 6. According to Mr. Rienzi, however, the proportion of Consumptive to other patients in Naples is 1 to 12, due allowance being made for the influx of Consumptive invalids. Mr. Rienzi states that, in Paris 1 phthisical person is met with in 4 cases of sickness. Mr. Cas. Broussais has shewn that the medical statistics of 14 principal stations in the provinces of Algiers, Bonn, Oran, and Constantine, give 1 death from phthisis in 100 deaths, and 1 case of phthisis in 561 cases of sickness; whilst, according to Mr. Benoiston, whose researches extend over a period of 12 years, and are confirmed by those made by Mr. C. Broussais at the Military Hospital of Val-de-Grace, it is proved that, in the French Army, 1 death in 5 arises from phthisis.—*Med. Chir. Review*, January, 1846. In the *British and Foreign Medico-Chirurgical Review*, for January 1852, Mr. Benoiston is, however, cited as stating that of 1,000 Soldiers dying in the North of France, 85 were tuberculous; while, of an equal number in the Central parts and the South, 73 and 82 were thus affected.



We have already seen that, according to the calculations of Mr. Farre, the female sex—more numerous and generally more healthy than the male—fall victims to phthisis in a very considerably larger proportion.\*

Some very important facts have been elicited by Dr. Guy with regard to the influence of various employments in developing Pulmonary Consumption and other maladies. Dr. Guy observed that the ratio of cases of phthisis was somewhat higher in persons following in-door employment than those working in the open air; and that the disease is fatal at an earlier age in the former than in the latter class. With regard to the influence of in-door employments, it is found that the ratio of cases of Pulmonary Consumption to those of all other diseases is highest when the amount of exertion is least, and lowest when it is greatest; and that the age at which the disease makes its attack, and at which it proves fatal, is earlier in employments requiring little exertion than in those requiring more exertion; and in those requiring moderate exertion than in those demanding great effort. In the same manner, the per-centage proportion of deaths under 40 years of age is highest where there is least exertion, lowest where there is greatest, and intermediate where there is an intermediate degree of exertion. The maximum age, in the men following the more laborious out-door employments, is lower by one year than in those using less exertion; and, in the latter, there is a considerable excess of aged men.

It is explained, however, that employments requiring little exertion prove fatal by inducing an excess of cases of Pulmonary Consumption,—those requiring great exertion, by occasioning *other* diseases of the air-passages and lungs to-

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\* Here, however, we are met with another of the perplexing contrarities of statistics. It appears that the Metropolitan Returns of the Registrar-General for 1843-46 shew an excess of deaths from Consumption among males in the proportion of 53 to 47 (*Medical Gazette*, December 14th, 1849); while the statistics of the London Hospital for Consumption give 2,679 male to 1,569 female patients. Still these statements, do not appear to be at all irreconcilable with the deductions of Mr. Farre. It will be remembered that the proportionate number of female operatives, factory-workers, &c., is far smaller in London than in many of our other large manufacturing towns; and the greater prevalence of intemperance among men of the poorer classes in London, than among females, must also be taken into account. The report of the Hospital above alluded to, shews that under 25 years of age, the liability to consumption is greater in females than in males by nearly 10 per cent. while above 35, the liability is greater in males than in females by about 12 per cent. It is of course safer, however, to deduce results of this kind from the ascertained causes of death throughout the entire population of a town or nation. A greater influx of patients of one sex may be determined by many circumstances in the case of any particular hospital.



wards the commencement of old age. Exposure to a high temperature does not appear to exercise any injurious influence upon health, during the earlier periods of life; but it is found to be unfavorable to longevity.\*

The First Report of the London Hospital for Consumption, which embraces facts deduced from the cases treated in that institution between September, 1842, and December, 1848, goes far to support Dr. Guy's opinions. It appears that Tailors, Clerks, Shopmen, Printers, and Compositors, were the classes of workmen who most frequently sought relief at the Hospital.

Dr. Guy has also afforded conclusive evidence of the fact, that the tendency to Consumption is much greater among tradesmen and artizans, than among independent gentlemen and professional men.†

Taking sufficiently into account the action of ill-ventilation and lighting, heated atmosphere, constrained positions of the body, and deficient exercise; the inhalation of dust and flocculent particles; smoke or pernicious gases or vapours; ill-feeding; want of personal cleanliness, &c.;—and also bearing in consideration the effect of the habitual intemperance, carelessness, and profligacy, which are too generally found associated with those injurious influences among the working classes, it appears certain that there are several trades which render the artizans who follow them most especially liable to the ravages of Phthisical Disease.

A reference to one or two of the more destructive occupations must suffice here.

It has long been known that the unfortunate class of Working Tailors in the Metropolis‡ and in other large towns are, in an extraordinary degree, liable to die of Consumption, and to suffer dangerous impairment of health from other forms of disease of strumous origin.§ As a class, these men

\* Further Contributions to a Knowledge of the Influence of Employments on Health, &c.—*British and Foreign Medical Review*, 1846.

† He mentions, in his *Lectures delivered at the Liverpool Mechanics' Institution*, in 1846, that "while 1 death out of every 6, occurring in the gentry at 15 years of age and upwards, was due to consumption, 1 out of every 3½, occurring among tradesmen of the same ages, and 1 out of every 3¼ occurring in the labouring class, is traceable to that cause.

‡ This class of men are said to number 23,000 in London, or about 1 tailor to every 48 males in the Metropolis—scarcely an excessive proportion; even when the number of children among the male inhabitants is duly taken into account.

§ Some years ago, Mr. Thackrah, of Leeds, measured several tailors round the chest; the dimensions, instead of being 36 inches, were, in most cases, only 33 inches. A statement was published at the same time respecting a



are wretchedly under-paid and over-worked, ill-fed, and in-temperate. The closeness, heat, and ill-ventilation of their work-rooms are described as something barely within the endurance of human existence.\* It is considered that a very high temperature is required in those work-rooms to aid in some manner in giving a proper appearance to the work:—it has been shewn that this result may be as certainly produced by artificially heating large and well-ventilated rooms to the required temperature, as by the usual expedient of sedulously preventing all access of pure air to the wretched attics which are usually chosen as the purgatories of these unfortunate workmen.

It is notorious that the lives of the working milliners, in a large proportion of the dress-making establishments of London, are still in no degree less miserable, or less exposed to preventible causes of disease, than are those of the journey-men tailors. This subject was first mooted in the second Report of the Children's Employment Commission, presented

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tailoring establishment in London, in which 334 men were employed. Of this number, not more than 6 had reached 60 years of age, and 3 of these were afflicted with curvature of the spine; 14 were about 50, and most of the others about 40. They were described as "so subject to fistula, that they have a 'Fistula-Club.'" Their most common affections are dyspepsia, diarrhoea, and dull headache, with giddiness, especially during summer. They attribute their complaints to two causes, one of which is the posture, the body bent for 13 hours a day, the other, the heat of the shop."—(As cited in the *Working Classes Association's Manual of Public Health*.)

\* The following startling details have been given by Dr. Southwood Smith:—"I find it stated for example (and the description here given of one occupation, that of the journeyman tailor, is applicable to many), that in a room 16 or 18 yards long, and 7 or 8 yards wide, eighty men worked together; the men were close together, nearly knee to knee. In summer-time, the heat of the men and the heat of the irons made the room 20 or 30 degrees higher than the heat outside; the heat was then most suffocating, especially after the candles were lighted. "I have known young men," says this witness, "tailors from the country, faint away in the shop from excessive heat and closeness; persons, working-men, coming into the shop, to see some of the men, used to complain of the heat, and also of the smell as intolerable. The men sat as loosely as they possibly could, and the perspiration ran from them. It is of frequent occurrence in such workshops that light suits of clothes are spoiled from the perspiration of the hand, and the dust and flue which arise during the work. I have seen £50 worth of work spoiled in the course of the summer season from this cause. In winter, these places are still more unhealthy, as the heat from the candles and the closeness is much greater. Any cold currents of air which come in give annoyance to those who are sitting near the draught. There is continued squabbling as to the windows being opened; those who are near the windows, and who do not feel the heat so much as the men near the stoves, objecting to their being opened. The oldest, who had been inured to the heat, did not like the cold, and generally prevailed in keeping out the cold, that is, the *fresh* air. Such has been the state of the atmosphere, that in the very coldest nights large thick tallow candles (quarter of a pound candles) have melted and fallen over from the



to Parliament early in 1843. This document contained the following statements among others of an equally painful character:—

“It is estimated that there are, in London, in the millinery and dress-making business, at least 1,500 employers, and that the number of young people engaged by each employer varies from two or three to twenty-five or thirty-five, the average in each establishment being about ten, making in the whole, 15,000: but this does not include journey-women who work at their own houses, of whom there always are great numbers. In some of what are considered the best-regulated establishments, during the fashionable season, occupying about four months in the year, the regular hours of work are fifteen; but, on emergencies, which frequently recur, these hours extend to eighteen. In many establishments, the hours of work during the season are unlimited,—the young women never getting more than six, often not more than four, sometimes only three, and occasionally not more than two hours, for rest and sleep out of the twenty-four; and very frequently they work all night.” To this it was added that—“in the drive of the season, the work is continued all night three times a week,” and that “there are houses in London which work on Sundays.” These facts leave little room for wonderment at the evidence of a medical witness which follows. This gentleman stated that he “has had ample opportunity of watching many of these cases for a long time; the young persons so affected may leave

heat. This state of the place of work, produced a very depressing effect on the energies of the workmen. Many could not stay out the hours, and went away earlier; those who were not accustomed to the place generally lost appetite. The natural effect of the depression was, that we had recourse to drink as a stimulant;—gin being taken instead of food. I should say the greater part of the habit of drinking was produced by the state of the place of work; because, when men work by themselves, or only two or three together, in cooler and less close places, there is scarcely any drinking between times. Nearly all this drinking proceeds from the large shops where the men are crowded together in close rooms: it is the same in shops in the country. In a rural place, the tailor, where he works by himself, or with only two or three together, takes very little of the fermented liquor or spirits which the men feel themselves under a sort of necessity for doing in towns. The closer the ventilation of the places of work, the worse are the habits of the men working in them.’ A large mass of evidence has been collected to shew that a similar state of things prevails in other occupations.”

Still the Doctor shews that a sum of £1,325 is annually subscribed by the masters and working-men for the relief of aged and infirm tailors, while no contribution is raised to prevent the production of sickness and premature infirmity; although a comparatively small sum, expended under scientific direction, in the ventilation of the places of work, would prevent sickness, and retard the period of superannuation.



off work for a period, they may go into the country to their friends; but they never regain their health. Has known several who have married, has attended them for years; their health and strength are gone. The young dress-makers who are subject to these long hours suffer invariably from palpitation of the heart and indigestion. They are completely disorganised. Many of them die, especially from Consumption. \* No men work so long; it would be impossible for any animal to work so continuously with so little rest."

"Plurima hic ægra moritur vigilando; sed illum  
Languorem peperit cibus imperfectus, et hærens  
Ardenti stomacho. \* \* \* \* \*  
\* \* \* Magnis opibus dormitur in urbe;  
Inde caput morbi. \* \* \* \* \*

Before the expiration of that year, several benevolent ladies of high rank organized the "Association for the Aid and Protection of Dress-makers and Milliners," with a view to induce the principals to limit their hours of actual work to *twelve* per diem; to abolish the working on Sundays; to afford early and effective medical advice, change of air and other aid, in cases of sickness; to organise a Provident Society among the workwomen; to promote an improved system of ventilating the workrooms; and to aid in obviating the serious evils connected with the present system, by inducing ladies to allow a reasonable time for the execution of orders, and by the encouragement of those establishments which should zealously co-operate in carrying out the objects of the Association. These benevolent intentions have doubtless been carried out in many instances; still, numerous witnesses attest the fact that the evil in question continues in active and destructive operation.

In 1843, Dr. Calvert Holland published\* some very striking facts illustrative of the dire effects of "Dry-Grinding," in producing pulmonary and other diseases among the Scissor, Fork, Needle, Razor, and Knife-Grinders of Sheffield and Hathersage. Among a great number of other examples, Dr. Holland shewed that, in 1820, one fourth of the number of persons employed in fork-grinding died every five years, a rate of mortality exceeding every thing previously known in any branch of manufacture, or in any pursuit or occupation. Out of 1,000 deaths of persons above 20 years of age, the proportion between 20 and 30 was shewn to be 160 in England and Wales, and 184 in Sheffield; but, amongst the fork-grin-

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\* *London and Edinburgh Journal of Medical Science.*



ders, the proportion rose to the appalling number of 475, so that between these two periods of life, 3 in this trade died to 1 in the kingdom generally. Between the ages of 30 and 40, a still greater disparity presented itself. In the kingdom only 136 in 1,000 die; in Sheffield 164; but in the fork-grinding branch 410; so that between 20 and 40 years of age, 885 in this trade perish out of the 1,000; while in the kingdom at large the deaths are only 296. Out of 102 deaths of scissor-grinders, 86 took place under 45 years of age, and 5 only exceeded the age of 50; of 1,000 scissor-grinders, not one had reached the 65th year; while of an equal number of operatives in Manchester, at the time the report was made, there were 45 living at that age; and in the agricultural county of Northumberland, 119. With regard to Pulmonary Diseases alone, it was found that out of 213 workmen, 66 had suffered, or were affected with, inflammation in some part of the chest which had required medical treatment; 24 had had spitting of blood, and 18 had unequivocal organic disease of the lungs, exhibiting difficulty in breathing, urgent cough, and expectoration. With regard to needle-grinding, Dr. Holland states that the new hands are taken fresh from the plough for this employment, with vigorous constitutions, at a time of life when the animal system possesses considerable energy—that is, from the age of 17 to 20—are employed only six hours a day, having the rest of their time for gardening and other amusements; and yet the majority of them are killed off under 30 years of age, after two or three years of suffering. The workmen describe that, during the dry-grinding of razor blades, a gaseous matter is evolved, which is not only exceedingly disagreeable, but prejudicial, and which is necessarily inhaled. It is shewn that “the more destructive the branch, the more ignorant, reckless, and dissipated are the workmen, and the greater is the tendency to marry, and at exceedingly early ages.”

Many plans have been devised with a view to improving the condition of the shops, where

———“draws the grinder his laborious breath.  
There coughing at his deadly trade he bends;  
Born to die young, he fears nor man nor death;  
Scorning the future, what he earns he spends;  
Debauch and riot are his bosom friends.”

Various ingenious attempts have been made to prevent the inhalation of the gritty and metallic particles,—by the use of apparatuses for covering the mouth and nose, some of



which are magnetic, &c.; but, as their employment is voluntary on the part of the men, they in a great measure fail. A more effectual means was invented by Mr. Abraham. A wooden funnel from ten to twelve inches square is placed a little above the surface of the revolving stone. This funnel is prolonged into a channel immediately under the surface of the floor, and which terminates close to an external wall. Within this channel is placed a revolving fan, which is worked by the same machinery that turns the stone; the fan, acting at this point, causes a strong current to flow from the mouth of each funnel, which carries along with it all the gritty and metallic particles evolved, leaving the room in which the operations are pursued free from any perceptible dust.

There are many other occupations attended with the extrication of fine particles of dust or flue:—such as those of the Mason, the Worker in Coal-mines, and of some descriptions of Factory-people, which are extensively productive of Phthisis and other Pulmonary Diseases. Most of these injurious influences, however, have known and applicable means of prevention; and it is to be trusted that, in process of time, a strict obligation on the part of manufacturers and others to observe the constant employment of these preventatives among their work-people, will form an essential constituent in the laws for the protection of the industrious classes.\*

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\* Some excellent prophylactic rules have been laid down by M. Fourncault, in his work on Phthisis (as quoted in the *British and Foreign Medical Review*) for persons predisposed to consumption. He directs that such individuals should be freely exposed to the light and air; that they must take sufficient and active exercise; and keep the skin clean and transpirable. He strenuously sets forth the advantages of physical education, and advocates (what has been much neglected,) the utility and advantage of selecting a trade or profession suited to the constitution. "Every man of a lymphatic constitution and, in consequence, unfit for labours occupying his whole time, should take moderate gardening exercise. When a fatal hereditariness predisposes him to pulmonary consumption, he will fly from towns, and devote himself to hunting, riding, or agriculture. If poor, he should enter the marine. If rich, travel a part of his life. If a land-owner, he should be a farmer in climates where the air is dry, and on elevated ground, where it is freely in motion. It cannot be too strongly recommended that gardening is among the indispensable employments in hospitals, orphan-houses, and penitentiaries. The life of a soldier is not suited to persons predisposed to phthisis, for the military services render that disease prevalent among the soldiers, and particularly the infantry. Prudence and foresight consequently forbid the admission into the ranks of the army, of young men the sons of phthisical parents; or of those born in damp localities or marshy plains," (it must here be recollected that, of late years, the opinion that marsh miasm is antagonistic to phthisis has been very strongly advanced, although several authorities reject it) "or mecha-



Recently, the condition of Bakers' Journeymen has called forth a good deal of attention in the United Kingdom. Working, for the most part, in underground cellars throughout the night,\* in the midst of an intensely-heated atmosphere, laden with the heavy fumes of the bread,† while they are continually liable to be exposed, when perspiring excessively, and thinly clad, to extreme transitions of temperature. Hence these men are nearly invariably, and almost unavoidably, the consumers of enormous quantities of beer and ardent spirits. They are marked among the most unfavorable subjects for treatment among all the varieties of broken-down wretches who crowd the public hospitals. They are very frequently the subjects of the worst form of rheumatism: and of cardiac and pulmonary affections; but the disease to which a very large proportion of their number fall victims is that almost hopeless malady—renal dropsy—the result at

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nics taken from cold and unhealthy workshops. It has been observed that a great number of Flemish weavers enlisted into the Belgian Army die of pulmonary phthisis. There can be no question that these different classes of recruits would escape from this dangerous influence if they were educated for sea-service. This destination would be an immense benefit to themselves individually, and a considerable saving to the country."

The following remarks by Dr. Hallowell (in the *American Journal of Medical Sciences*, January, 1850,) also deserve attention:—"One of the most important means of preventing the development of phthisis is the free admission of air into dwellings. Our state governments should prohibit the erection of buildings that do not meet the requirements for the maintenance of a healthy set of operatives. Not only their own interests, but those of other classes, re-acted upon by them, demand such a prohibition. It has been recommended that those of the poor who marry—and the same advice might be given to others—should select habitations that contain apartments which are large, and to which the air has free access. A vigorous offspring cannot be had by unhealthy parents. The progeny may be numerous, but will be unhealthy. The early marriages in this country" (America) "are a great evil:—the mother, for the most part, with a fragile constitution, is worn out by numerous births; and, by the care and attention given to the children, becomes a mere drudge. In society, she is rarely seen, and her influence is unfelt—she too often, in a few years, exhibits the marks of premature old age."

\* In a paper on the condition of the Edinburgh Bakers, in *Chambers' Journal* for August, 1846, it is mentioned that, on some occasions, particularly about Christmas, the Bakers of that city labour as many as eighteen or twenty hours a day.

† It appears that a decidedly prejudicial influence is exerted by these fumes. To the generality of persons, the odour of fresh bread inhaled for a short time is very delightful; but, in a short time, it becomes almost unbearable to those who are continually in the midst of it. On this account, lodgings over bakers' shops rarely let. It is remarkable how frequently the wives and children of Bakers, who take no active part in the preparation of the bread, have the same pallid, anæmial, doughy, aspect that characterises the operative bakers. It would seem that there is something in the air of these places which is unfavorable to sanguification.



once of their occupation and of their intemperance. Happily, the condition of this class has engaged the attention of philanthropists in a manner which will probably tend to its amelioration.

The influence of Lead in producing those distressing forms of paralysis—painters' colic and dropped hand—among persons who have been long employed, either amidst exhalations from painted surfaces, or in trades where the salts or oxydes of this metal gain free access to the skin, is generally known. Scrupulous cleanliness, the use of sulphuric acid lemonade as a beverage, &c., have been recommended as prophylactics; but it is evident that these afford but slender protection to men who are daily exposed to the contact of white paint, and who are constantly inhaling its pungent fumes. The introduction of an adequate substitute for this noxious pigment is a great desideratum in art. In 1833, the Academy of Paris announced that M. de Ruolz had demonstrated the perfect applicability of the Oxide of Antimony to all the uses of White-Lead as a pigment. Its colour was stated to be a very pure white, rivalling the purest silver-white; it is easily ground, and forms with oil an unctuous cohesive mixture. Compared with the White-Lead of Holland, its property of concealing is as 46 to 22, and mixed with other paints, it gives a much clearer and softer tone than White-Lead. M. Ruolz stated that it may be obtained from the native sulphuret of antimony, and at a third of the cost of ordinary white paint.\* In 1850, it was announced that the Academy awarded a prize of 2,500 francs to M. Leclaire for discovering a substitute for White-Lead in the preparation in bulk of White of Zinc, and its application to house-painting, by means of manganed oil, as a dryer.†

Another employment which is, or was a few years since, attended with extremely deleterious effects upon the work-

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\* Chambers.

† It was reported, in November, 1851, that the Academy of Medicine of Paris were engaged in investigating the influence of manufacture and use of the Oxide of Zinc upon the health of the workmen. Dr. Bouchut had shewn that about 50,000 persons in France are engaged in the manufacture and use of carbonate of lead; and that to these the substitution of the Oxide of Zinc is a matter of the first importance. The enquiry had not been completed, but it appeared, from M. Bouchut's researches, that in the manufacture of Oxide of Zinc the workmen have experienced certain accidents, but that these have been in no degree comparable with those arising from Carbonate of Lead, while the use of the Oxide in painting is not attended with injurious effects in any degree, comparable to those of the Carbonate of Lead.—Safe and guarded reports, which leave it very doubtful whether M. Leclaire has deserved his prize or not.



men engaged in it, is the enamelling of cards and ornamental papers by means of lead.

The advance of opinions which a very few years more must inevitably bring, will denounce, as absolutely unendurable by the State, every art, trade, manufacture, and calling, which tends to imperil the life even of a single individual annually, in ministering merely to the taste or to the luxury of the public. The maxim, *dulce et decorum est pro patria mori*, has, of late years, gained an acceptation which it assuredly cannot be permitted to hold. There was a time in which the security of a nation was considered to be dearly, but worthily, purchased by the devotion of the life of a single citizen. The life of one Roman was a thing of no small moment in the days of Horatius and Curtius—yet,

—“how can man die better,  
Than facing fearful odds,  
For the ashes of his fathers,  
And the temples of his gods?”

Now, human lives are wasted more basely than were even the lives of the retiarii and the myrmillones of the amphitheatres. The beautiful form of A. must receive its call to the grave in an effort to enable B. to imagine that she does not appear to disadvantage at the Lady Mayoress's ball. C., and D., and E., all fall victims to their exertions in supplying F. with well-built coats during some twenty or thirty years; G. is a paralysed cripple for life, because H. has registered a vow that his pinch-beck watch shall pass for gold; and I.'s undertaker's bill follows as the immediate result of the preparation of K.'s wedding-cards.—

“To what base uses we may return!”

The noble axiom of Captain Hunter,\*—“*I consider the life of a British seaman of more value than any ship in His Majesty's navy,*”—must hereafter become a practically acknowledged principle among all orders of civilised men.†

\* See *Edinburgh Review*.

† The following sentences from “*The Claims of Labour*” are worthy to be placed in letters of gold over the entrance of every work-room:—

“Each branch of manufactures has its peculiar dangers and disadvantages; and it behoves the master to be frequently directing his attention to remedy the peculiar evils of his manufacture. He is to be the pioneer to find out for his men ways of avoiding these evils. It cannot be his duty to study only how to make his fabric cheaper, and not to take any pains to see how it can be made to cost less of human life. \* \* \* In a thickly-peopled country like this, an employer of labour, if his work does not require much skill, can generally get any number of men to serve him, which would be a strange reason, however, for making the health of any one amongst those whom he does employ less precious in his eyes. Human labour may be ever so abundant, but *human life cannot be cheap.*”



With all their imperfections, the statistical deductions of the last few years have established in science the principle always acknowledged in religion,—that no event can be considered as *accidental*, or as the result of a mere concurrence of chances. Fixed laws evidently co-operate in the developement of every event, be it great or small, which combines to form the visible life and working of the universe; and, although a proportion of those laws are beyond the reckoning of our philosophy, some of them appear to be perfectly within our view, and, to a certain degree, subject to our control.

Accordingly,—as it is found that nearly the same number of undirected letters are annually posted at St. Martin's-le-Grand, or that nearly similar totals would result if two persons should each throw the dice a million times—so will it be observed that, subject mainly to certain very appreciable influences, nearly the same number of births, marriages, and deaths, will occur from week to week in a great city; and nearly the same number of individuals will be maimed or killed, year by year, on the railroads, in the mines, or in the large manufactories of an industrial country.

In the Tempest, the Earthquake, the Avalanche, the Lightning, and the Flood, we submissively recognise agents of deadly fatality, which must continue in nearly unrestrained operation while the processes of nature last, and from the effects of which man, with all his caution, and all his art, can never certainly secure his life.

“Such evils sin hath wrought; and such a flame  
Kindled in Heaven, that it burns down to earth,  
And in the furious inquest, that it makes  
On God's behalf, lays waste his fairest works.  
The very elements, though each be meant  
The minister of man, to serve his wants,  
Conspire against him. With his breath he draws  
A plague into his blood; and cannot use  
Life's necessary means, but he must die.  
Storms rise to o'erwhelm him: or if stormy winds  
Rise not, the waters of the deep shall rise,  
And, needing none assistance of the storm,  
Shall roll themselves ashore, and reach him there.  
The earth shall shake him out of all his holds,  
Or make his house his grave; or so content,  
Shall counterfeit the motions of the flood,  
And drown him in her dry and dusty gulfs.”

Still, these natural calamities are by no means the most frequent or the gravest causes of sudden destruction of life amongst us. The larger proportion of sudden and violent



deaths, from "accidental" causes, occur during the working out of man's own undertakings, as the results of his own carelessness, rashness, want of sense, and want of foresight. The majority of the accidents to life and limb, which tell so severely among the population of Europe in times of peace, of course fall most heavily upon the labouring classes. The means of preventing these frightful casualties might worthily engage the study of all the years of a life as great and as valuable as that of Howard or of Davy. A sense of the inevitable approach of death carries a thrill of instinctive horror to the hearts of the bravest and most reckless amongst us;—but the terror of sudden extinction, when the vigor of life is strongest, by the crushing of every sensitive fibre into a gory mass, in which scarcely a trace of manhood is distinguishable; or the still more vivid dread of perishing slowly, broken and mutilated, when the burning torture of the surgeon's knife has passed—and failed—must lead us to regard, with the liveliest and most active interest, every judicious endeavour that may be made to guard the working classes from these tremendous calamities. Few will forget the exquisite pathos of the satirist's description—

Nam si procubuit, qui saxa Ligustica portat  
Axis, et eversum fudit super agmina montem,  
Quid superest de corporibus? quis membra, quis ossa  
Invenit? obtritum vulgi perit omne cadaver  
More animæ. Domus interea secunda patellas  
Jam lavat et buccâ foculum excitat, et sonat unctis  
Strigilibus, pleno et componit linthea gutto.  
Hæc inter pueros varie properantur; at ille  
Jam sedet in ripâ, tetrumque novitius horret  
Porthmea.

There is scarcely a foot of ground in any of our cities upon which some such deadly catastrophe has not occurred.

It appears from the Registrar-General's Return, that, in 1842, no less than 10,881 violent deaths (inclusive of suicides) occurred in England and Wales.\* It is further gleaned from the same reports that, in 1843, the accidental deaths

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\* The number in the preceding years, as given in the *Edinburgh Review*, were—1838—11,727; 1839—11,632; 1840—11,594; 1841—11,000. In 1845 it was calculated (in the *Atlas*) that the scattered deaths from various descriptions of violence amounted to an average of 12,000 yearly in England and Wales alone; and that the probable amount of orphanage, generally destitute, produced by this cause was 24,000 yearly; and the amount of destitute widowhood 7,000. These numbers, however, were merely given approximatively. In the above journal the total number of violent deaths occurring in the three kingdoms is computed at 20,000 (in *Chambers' Sanitary Economy* it is reckoned as 24,000). "This," says the able writer



in France were 6,436; and in 1844,—6,729. It is elsewhere stated that, in 1846, they amounted in that country to 7,558; of which 3,861 were reported to have been caused by drowning, 624 by carriage accidents, and 45 by railroad accidents.\*

These numbers will afford us some aid in discovering the classes of persons among whom violent "accidental" deaths occur most frequently. Miners, Railroad Employees, Factory and other Artizans, and sea-faring men, are evidently those who suffer most.

An enquiry into the possibility of diminishing the frequency of such deaths, by endeavouring to control their proximate causes, may well engage our most earnest attention.†

It has been ascertained that, in 1850, the number of persons actually employed in British mines was 193,000.‡

In 1846, it was reported, by a committee of the House of Commons, that during the foregoing twenty-five years, there had been, at least, 2,070 deaths from explosions in mines; and that the mortality from that cause was then proceeding at the rate of 100 a year.§

The loss of life in mines has certainly not diminished since these calculations were made; indeed, of late, the accidents have been of extraordinary frequency and severity.

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of the article in the *Edinburgh*, "is, in itself, a vast mass of calamity. It would appal the world if it came in considerable instalments. All Europe was startled by the accident which killed 1,200 people at the marriage of Marie Antoinette, and which was in some measure repeated on that of Marie Louise. Our five great naval victories in the late war cost us only 1,233 killed, and 3,626 wounded; while 20,000 were probably beyond the British loss in battle in any one of its campaigns. Twenty thousand deaths would have cut no mean figure in the human sacrifices of Napoleon; and it will be remembered that the result of the three bloody days of the battle of Paris, was deemed to be grossly exaggerated when the deaths were computed at 8,000."

\* *Medical Gazette*, September, 1848.

† The following remarks have been greatly aided by a highly valuable article entitled "Fatal Accidents: how far Preventable," in the *Edinburgh Review*.

‡ Spacknan's *Analysis of the Occupations of the People*.

§ These numbers, however, do not appear by any means to represent the full extent of this class of evils. The Editors of *Chambers' Journal*, in March 1844, referred to a list of accidents gleaned from the pages of the *Mining Journal*, during a period of eight months, by which it appeared that 301 individuals had lost their lives, and 182 received severe and permanent injuries. According to Parliamentary Report, the annual loss of life in the Bromwich, Tipton, Dudley, and Wolverhampton districts amounted to 110; and it was stated, by the Midland Mining Commission, that out of 1,122 deaths of colliers, no fewer than 610 arose from accidents. It is added that the best authorities allow that scarcely a fifth of the accidents which happen in connexion with mining operations, is recorded in the newspapers, and proceeding on this estimate, they calculate that 2,500 lives are annually lost to Britain through this cause alone.



The immense mass of Parliamentary Evidence on the subject of collieries, which is now before the public, contains abundant evidences of the difficulty which has hitherto existed in ascertaining either the true causes, or the precise results of accidents in mines; still, it appears to be very certain that the working of unsafe mines, and the careless employment of the safety-lamp, added to the general recklessness of the workmen in blasting, &c., are mainly operative in producing the casualties. The Select Parliamentary Committee appointed in 1835, to enquire into the accidents in mines, stated it as a fact, that since the introduction of Davy-lamps, accidents had rather increased than diminished,—because coal was now worked under circumstances of danger in which it would never have been ventured on before.\*

Beyond this, the almost incredible want of caution so universal among the workmen, renders life always precarious, even in the safest mines. As examples of these two sources of peril, we may refer to the newspaper reports of an explosion which occurred in a mine near Newcastle in August, 1851, in which from thirty to forty individuals perished. It was considered that the pit was badly ventilated; at all events, such an accident as this could scarcely have been absolutely unavoidable. Again, at about the same time, an explosion which occurred at the Upperley Coal Mines in the Potteries, was occasioned by the wilful carelessness of the unfortunate men whose lives fell a sacrifice. Seven men entered the mine, one only of these had a safety-lamp, the others carried only unprotected candles;—a quantity of gas, which had collected in the roof, at once ignited, and the whole party perished in the explosion. In December, 1851, an explosion like that of a volcano suddenly burst from the mouth of the Warren Vale Pit Colliery, near Rotherham. As soon as the pit could be entered, 52 dead bodies were found in the recesses of the mine, and nine unfortunates were extricated so burned and shattered that it was feared several of them could not recover. The supposed cause of the accident was “the fall of a portion of the roof of the pit, stopping the usual current of ventilation, liberating a large quantity of foul air, and forcing it into the parts where the miners *were working with candles.*” At about the same time, 16 miners were burnt by an explosion of fire-damp in the Norbury Hall Colliery near Wigan. “As usual,” says the report, “the men worked with unprotected candles.” Evidences

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\* *Edinburgh Review, ut supra.*



of the utter recklessness of the miners are met with in every report on colliery explosions. In the report submitted by Sir H. De la Beche and Dr. Lyon Playfair to Lord Lincoln in 1836, it is stated that, when paid for their work by the ton, or piece, the miners will remove the covers of their lamps, or employ a candle at every risk. Managers have the greatest difficulty in preventing the continual use of candles in suspected places, before the danger becomes known to them. The less light afforded by the lamps is considered to be a great drawback to their use, when it can be avoided. A lamp not open to this objection, is that modification in which the wire-gauze cylinder is protected by a thick glass cover.\* Apart from the injudicious management of lights, the principal causes of fatal accidents in mines are found to be a bad condition of the ropes and machinery of the shafts; the fall of ill-secured roofs; the eruption of water from old and unregarded wastes; and faulty systems of ventilation, allowing of the accumulation of *fire-damp* (carburetted hydrogen), and of *choke-damp* (car-

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\* The following striking facts are related by a correspondent of the *Illustrated London News* of March, 1851:—"The Davy-Lamp is to fire-damp what vaccination is to the small-pox; yet I have over and over again been assured, in the North of England, that the proprietors and overlookers of mines find one of their utmost difficulties in the task of inducing the workmen to bestow the most ordinary care upon the necessary condition of their safety. To save themselves the trouble of cleansing the wire, the workmen willingly use a candle, amid escaping whiffs of fire-damp. Rather than give up a few minutes' smoke, they will open up the shade of the preserving wire, and very frequently, if they find the noxious gas escaping copiously from the seam, they will first 'brush it out,' as they call it, with their jackets, and then use an unsheltered light with all the coolness in life. This appears to have been the case in the Lanarkshire mine. It was a "fiery pit," that is, abounded in explosive gas, and yet the work seems to have been carried on with bare and unprotected candles. But the recklessness is universal beneath ground. A couple of years ago, I stood in a 'goaf' of one of the deepest mines in Durham. The 'goaf' is the worked-out portion of the mine, where the props have been removed, and the roof has been left to crumble. Here the explosive vapour generates foulest and thickest. In many cases, indeed, the goaves are perfect reservoirs of gas more dangerous, because more subtle, than gunpowder. Glancing at the Davys which I and my guide held, I noticed a bright blueish fire burning inside the wire, just above and around the flame of the wick. Hastily pointing out the phenomenon, I enquired what it was, 'Well,' said my companion, with a pleasant North-Country drawl, 'well, that's the 'damp' burning inside the Davy.' 'So there is damp all around us?' 'I should think so, millions of gallons.' 'And do you mean to say that the only thing between us and eternity is that shred of gauze-wire?' 'Of course, what did you think there was?' For a moment my natural course tended to a speedy movement in the direction of the shaft; my guide's was to lay down his burning lamp, and laugh at my panic until the low roofs of the vaulted goaf rung again."



bonic acid gas). These accidents appear to be all susceptible of prevention.\*

There is now a law for the inspection of coal mines in Great Britain.† In 1847 the House of Commons threw out a Bill, the object of which was to compel, for a limited period, (until August, 1848) the use of safety-lamps, and to prohibit the employment of gunpowder, or other explosive materials in all fiery collieries. We find it urged, in the report by Sir H. De la Beche and Dr. Playfair, that "there are many collieries in which fire-damp never appears, and it would justly be considered a hardship, in such cases, to compel a precaution altogether unnecessary." On the other hand, Mr. West observes that mines receiving a tolerable character, had been the scenes of frequent explosions; for instance, the Jarrow Mine; where, although reported "to be not very fiery," there had been six explosions in the course of 28 years, and 140 persons had been killed. In such cases, it would appear right to give the workmen the benefit of the doubt, by compelling them to carry locked Davy-Lamps. The numbers of individuals reported as killed on the Railway Lines of the United Kingdom—including passengers, railway servants, and the public at large, were, in 1841—270; in 1847—211; in 1848—240‡, in 1849—202; and in 1850—216. This last number included 4 suicides. The total number of persons injured in 1850 was 256. These casualties occurred on 5,996 miles of line (the number open on the 1st January, 1850), and during between sixty and seventy millions of individual journeys. Dr. Lardner shews that, out of the 806 railway casualties occurring in the two years above alluded to, 327 only suffered from accidents

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\* Space could scarcely be afforded here for a discussion of the various precautionary measures which have been proposed. They will be found well and practically noticed in *Chambers' Edinburgh Journal*, vol. i. (N. S.) p. 206; and vol. ii. p. 414; as well as in the reports of a paper entitled *A Comparative View of Recorded Explosions in Coal Mines*, read by Mr. West at a meeting of the Institution of Civil Engineers in November, 1850. The benefit likely to result from improving the moral and educational condition of the workmen has been strongly insisted upon by Mr. West, as a means of developing their better qualities and reflective powers, while the love of life might become a safe-guard against accident.

† 13 and 14 Vict. c. 100.

‡ *Edinburgh Review*. Dr. Lardner's numbers are lower than these. He states that during the two years ending December 31st, 1848,—413 deaths and 393 cases of injury were occasioned by railway traffic: but these figures appear to refer merely to the *English* railroads. The present remarks are little more than an abstract of the comments on railway accidents, given in the above-mentioned *Review*, and of those contained in the xiv. chapter of Dr. Lardner's valuable work on *Railway Economy*.



which were beyond their own personal control; of the remainder, 3 suffered from the misconduct of railway servants; all the others might have avoided their fates by due precaution.

"A belief," says the *Edinburgh Review*, "is now entertained among scientific men, and it is strongly supported by the reports of official inspectors, that no accident occurs of which it may not be said that proper precautions—involving probably a considerable outlay—would have prevented it." Again:—"It has not been, in general, from the bold and original experiments of celebrated engineers that the public have suffered. Men so high in their profession feel the responsibility of power, and the risk to which professional character may be exposed by mischievous blunders. It is in the subordinate and simple operations left to ignorant and irresponsible people, unwatched and unknown, that danger lurks. A welding has been carelessly finished. A bar or girder has an internal crack, caused, perhaps, by sudden expansion or contraction in its manufacture. Through such latent causes, in the midst of a general feeling of security, the infinitesimal overstrain severs the parts, and a crash follows (as lately in Grace-church Street), of which all the realm hears with commiserating horror. Amongst the other sources of danger believed to be inscrutable, it used to be stated on scientific evidence, that such internal defects in the materials used in connexion with railways were not discoverable. The public were disabused of this notion, when they found that every piece of iron, to be subjected to a possible strain in the construction of the Crystal Palace, was to be tested by the hydraulic press. Three formidable accidents, reported by the Commissioners of 1850, were caused by fractures where the metal was found porous and crystalline.\*

Against very strenuous attempts to carry, as a point of law, the principle that they were not responsible for the consequences of these 'latent defects,' as they were called, the railway companies have been held liable for accidents thus arising; and it is suggested that, to afford the public a valid protection from risk, the testing of the sufficiency of materials previously to their employment should be enforced by the Legislature.

It is shewn that the number of passengers killed was 30, in 1847; 21, in 1848; 23, in 1849; and 32, in 1850.

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\* A most dangerous defect frequently present in the long-used axles of horse-carriages.



the number of passengers injured in the last mentioned year being 171. "So small a proportion of deaths," it is remarked, "levied on the travelling community, shews that what the companies require, is, not so much control, as regulation. A more effective check on carelessness or parsimony, and a closer responsibility might reduce the number of accidents nearly to zero. In the mean time, we have no hold on companies to prevent them from gambling with the public safety. In other words, though they are pecuniarily responsible for injuries caused by carelessness or defectiveness, and though they know that, when any flagrant calamity occurs, their line will be, for a time, deserted, they have it in their power to run risks involving both the lives of their passengers and their own fortunes, in sanguine reliance on the chapter of accidents turning up in their favor, and we know that they have persevered in doing so." It is further shewn that although the railway commissioners may expostulate, and recommend greater caution and the adoption of preventive measures, in cases where accidents from preventable causes or practices fraught with dangerous consequences have come to light, there appears to be no law subjecting the managing partners to responsibility, by punishment as criminals, should any company choose to disregard these representations, and, for the sake of present economy, to take the chance of a similar catastrophe.

There can be little doubt that strong and efficient remedies might readily be found for such laxity as this.

Further, we have a formidable item of railway accidents in trespassers and other persons, neither passengers nor servants of the company, among whom the destruction of life in 1847 was returned as 57; in 1848 as 43; in 1849 as 52; and in 1850 as 48. These numbers are regarded as representing, in a great measure, "victims deliberately offered up to a cheap construction of railways. Level crossings are less expensive than bridges or tunnels, and they are sanctioned at so many lives a year. It would, we think, have been a good rule from the commencement, and one of which the cost would have been well repaid to the public in its sense of security and ease of mind, had railways been as it were hermetically sealed, so as to render trespassing on them next to impossible."

The preponderance of fatal accidents is, however, found among the railway servants. Of these there were killed in 1847—124; in 1848—138, in 1849—127; and in 1850—128. With regard to this item, strong and just indignation is ex-



pressed against the contractors for railway cuttings and other like works, in tempting their ignorant servants to put their lives in peril. As, for example, on the fatal practice remarked upon by Mr. Chadwick, of making use of iron instead of copper stemmers in ramming home the powder for blasts. Doubtless, a large proportion of the deaths above enumerated might have been prevented under wise regulations:—still, it cannot be questioned that a reckless insensibility to dangers which are daily present to them, gives rise to a large proportion of the casualties among railway employees.\*

The law for the protection of factory-workers from that great source of peril—the entanglement of their garments and limbs by the wheels or blades of unguarded machinery,—has some appearance of strictness in its requisitions.† It appears, however, that this law is not unfrequently evaded, with the most disastrous consequences. In a case which was decided so lately as July, 1851, by the magistrates of Leeds, a flax-spinner escaped the penalty for a severe injury sustained by a girl, owing to the unfenced state of certain machinery in his mill, by shewing that, although a general notice, applicable to all flax machinery in the mill had been given by the inspector in the preceding February, the machine in question had not been brought into the mill until the following March, and that, consequently, the notice did not apply to that particular machine. Another egregious instance of wanton defiance of this law, and escape of the penalty, is given in the article above cited. It certainly does appear that the enactment would have been more complete, had it rendered compulsory the fencing off of all dangerous machinery immediately upon its erection and previous to its employment; a fine of really crushing severity being imposed whenever the inspector should discover a working machine imperfectly secured, without its being necessary that injury to life or limb should have resulted from the proprietor's criminal incautiousness. The fines usually inflicted un-

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\* Dr. Lardner's work may be profitably referred to for a careful analysis of the causes of railway accidents, and for some judicious remarks upon the means necessary for their prevention.

† The 60th Section of the 7th and 8th Victoria, chap. 15, enacts—"that if any person shall suffer any bodily injury in consequence of the occupier of a factory having neglected to fence any part of the machinery of which he shall have received notice from the inspector that the same was deemed to be dangerous, the occupiers of such factory shall pay a penalty of not less than £10, and not more than £100."



der the present Act appear to be altogether inadequate.\* The article already quoted contains several valuable hints upon the importance of a regulating influence in providing for the safety of factories, of theatres, and other public buildings, in which large numbers of persons congregate, by directing that their materials should be originally sound, and their repairs effective, and that they should be provided with wide staircases and avenues of exit, that fatal crushing may not result in panic outrushes at the alarm of fire, &c.†

The exceeding prevalence of accidents to shipping, attended with enormous loss of life, and resulting from causes of a demonstrably preventable character, has long engaged the attention of the English Government. Upwards of ten years ago, the public were in possession of evidence adduced in the reports of Parliamentary Committees of enquiries into the

\* From the recently published Report of the Inspector of Factories for the six months ending 30th April, 1851, it appears that the total number of informations for infractions of the Factory Acts, sworn within the six months, was 446; and that, of these, 312 terminated in convictions, 103 were withdrawn on payment of costs; 10 withdrawn before heard; and 21 dismissed. In 299 cases, penalties were inflicted of £1; in 62 cases of £2; in 21 cases of £3; in 2 cases of £5; and, in 1 case of £10. The total amount of fines inflicted was £436, and the costs amounting to £234.16s. 11d.; that is to say, not one fine was inflicted during that period adequate to the restraint of an evil involving or menacing injury to life or limb. The loss of a single finger would have been ill compensated, even to the poorest workman, by the total amount of the three hundred and twelve fines. It is stated that the factory people in the neighbourhood of Manchester have, of late, expressed great and apparently very just dissatisfaction at the continual breaches of several clauses of the Factory Act now taking place in various districts, and that they have attempted to raise a fund to be employed in enforcing penalties leviable under the Act.

† The city of London Sewers' Act contains a rather stringent clause relative to houses in a ruinous and dangerous state. This is also extended to any house or building which, in the opinion of the medical officer of health, is permanently unwholesome and unfit for human habitation. Vitruvius is quoted as an authority enjoining that the adits of public buildings should be wide, numerous, and direct—as exemplified in the remains of the ancient amphitheatres—a rule which was enforceable by the Roman Ædile police, “on the sound old principle that no structure of a character to endanger the public safety should be permitted to exist.” Tacitus relates that, in the Consulship of M. Licinius and L. Calphurnius, one Atilius built an amphitheatre at Fidenæ with so unstable a foundation, that it fell while crowded with spectators, and about 50,000 persons were killed or mutilated. The senate banished Atilius, and decreed that no person with a fortune of less than 400,000 sesterces should exhibit gladiatorial games, and that no amphitheatre should be erected in future without due examination of the foundation. The Ædiles, however, must have looked rather remissly to these matters, to have caused Juvenal to exclaim,—

Nos urbem colimus tenui tibicine fultam  
Magna parte sui : nam si labentibus obstat  
Villicus, et veteris rimæ contexit hiatus :  
Securos pendente jubet dormire ruinâ.



causes of shipwrecks in the merchant navy, to the effect that, under the prevailing system of assurance, the recklessness of shippers in placing cargoes on board the most notoriously unseaworthy vessels, and of entrusting such craft to masters of the worst character—nay, even to men absolutely destitute of even an empirical smattering of navigation, was absolutely astounding. We are told that these shippers of goods were perfectly irresponsible, there being no authority to investigate their actions, while the destructive effects of assurance removed all motives for care. It was declared that any man who could procure a lading for a vessel from any foreign port would seldom be refused the appointment of master, or have any inquiry made into his character;—that a Portsmouth publican, who, evidently, had not the most distant conception of navigation, but depended on the empirical knowledge of one of the seamen, commanded a vessel trading from Lisbon to London;—that, on one occasion a certain brig, of two hundred tons, bound for London, in a run of five or six days, with a fair wind, from Cape Finisterre, made Cape Clear instead of the Land's End—the master being perfectly ignorant of navigation!—that there was no interest in getting good hands, and that merchant vessels were to a shameful extent inadequately manned;—that, when a ship was lost, the widowhood and orphanage did not fall on the owners; on the contrary, the owners frequently gained when a vessel was lost, there was no claim for wages, and the parish supported the widows and orphans;—that it was believed to have been ascertained beyond contradiction, that the number of British ships which is lost, is more than one in twenty-four, and that property to the value of nearly three millions annually is thus lost to the nation, chiefly through ignorance, and the present system of nautical insurance, which insures any vessel, on a good premium, however unsafe or decayed. Further, that for every *seventeen* sailors who die, *twelve* are drowned or lost by shipwreck; and that nearly two thousand perish annually in the deep. Thus hundreds of widows, and thousands of children, are thrown on the precarious charity of the public.—In 1837 the following statements were made on respectable authority:—“So deficient is the construction of our ships, that the average annual loss, taking the period from 1793 to 1829, is 557 vessels; but, of late years, the loss has been increasing in an alarming degree—no fewer than 1,068 having, in the year

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\* *Tait's Magazine* for April.



1829 been wrecked, foundered, upset, or driven ashore. It appears, in fact, that our merchant ships are the worst in the world, and that they have been rapidly declining of late years. The chief cause of this is the system of Insurance, combined with classifying the ships at Lloyd's. After a certain length of time, a ship ceases to be in the first-class *A. 1.*, whatever may be her strength. The merchant, finding the rate of insurance is lowest on new ships, of course prefers them. The ship-owner is thus compelled to have—not good, but *new* ships; he, like the merchant, protects himself against the risk of loss from their insufficiency, by insurance; and hence it is only cheap ships that are in demand. A merchant ship of 1,000 tons, is only 3 inches thick in the bottom; while a ship of the Royal Navy, of equal tonnage, is 21 inches thick. Many merchant ships are so weak, even when new, that they cannot bear the weight of their own cargoes, unless when afloat, and hence the enormous loss of that kind of shipping compared with that of the Royal Navy and the vessels of the East India Company, neither of which are insured. In 1833, 800 merchant ships were lost, and not one of the Royal Navy. Although ship-builders, ship-owners, merchants, and insurers, may all contrive to carry on a lucrative business, the loss of property, amounting to about three millions a year, ultimately falls on the public, in the form of an increased price of the commodities carried by sea. The loss of life by this state of matters is so great that Professor Faraday lately mentioned, at the Royal Society, that of all classes of men, sailors are the shortest lived.” It appears that on the 1st January, 1841, the number of vessels belonging to the United Kingdom amounted to 21,983, and their tonnage to 2,724,107; and that the number of seamen employed in navigating British vessels was 160,509. It is shewn by the Navigation returns of January, 1852, that in the eleven months ending December 5th, 1851, 30,463 vessels employed in the foreign trade of the United Kingdom of 6,444,043 tonnage, entered inwards, and 28,749 ships of 60,071,131 tonnage cleared outwards; together with 122,211 ships employed in our coasting trade of 11,271,864 tonnage entered inwards; and 139,524 ships cleared outwards, of 12,291,592 tonnage.\* Notwithstanding the apparently stringent measures which have been

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\* *Laing's Prize Essay on the Existing Distress of the Country.* But according to the Rev. Mr. Angus, the number of vessels belonging to British ports in that year was 28,962 employing 201,340 men.



adopted to remedy certain of the above evils, recent statements would lead us to believe that there is still something very rotten in the state of our present merchant navy. It has been adduced from the Parliamentary Report lately published, containing an abstract of all the collisions, wrecks, and other accidents to vessels, which have fallen within the knowledge of Lloyd's between the 1st January, 1848, and the 31st December, 1850, that the number of reported accidents was about 13,500; that ship accidents of some sort or other occur at sea as nearly as may be at intervals of  $2\frac{3}{4}$  hours throughout the year, and it would appear that at least two thirds of these accidents are of a serious description. Again it is stated,\* that in 1850 six hundred and eighty English and foreign vessels were wrecked on the coasts, and within the seas of the British Isles, and that, as nearly as can be ascertained, 780 lives were lost. It is further shewn that, in this year, the whole number of life-boats on the British coasts was under *one hundred*, and that, of these, one-third were in an unserviceable condition. In that article some very just comments are made upon the fact, that the salvage of a bale of merchandise, or the recovery of a floating corpse, carries with it a pecuniary reward, but that there is no rule for rewarding those gallant men who are ever ready to start forth from every port and fishing-village along our iron-bound coast for the rescue of drowning crews.—*No salvage is obtainable upon the body of a LIVING man.*†

From a list appended to Gilly's *Narratives of Shipwrecks of the Royal Navy*, it appears that "the loss of life from serious accidents to this class of vessels, quite apart from the casualties of war, and the deaths from minor accidents of almost daily occurrence, falls very heavily upon the nation. It is here shown that between 1793 and 1850—or within nearly the average period of an admiral's service—about 167 Royal vessels were wrecked or burned, with the ascertained destruction of the lives of 15,229 men and officers, besides a very considerable number of other serious casualties,

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\* In an interesting paper in the *Household Words*.

† The highly laudable, but necessarily limited, measures of the "Royal Humane Society," of the "Royal Institution for the Preservation of Life from Shipwreck," and the "Shipwrecked Fishermen and Mariners' Royal Benevolent Society," are not to be overlooked. The latter Society has recently reported that, during the year 1851, upwards of 700 wrecks occurred on the coast of the United Kingdom, and that the managers are now making every exertion to increase the number of their life-boats at every point where they are likely to prove useful.



the precise extent of which appears not to have been ascertained.

The Admiralty authorities have long been in the habit of instituting strict inquiries into every case where their ships have been wrecked, or have received injury by being run on shore. The pilots of all our ports are held seriously responsible for misadventures of a similar character. Care now appears to be taken in securing the efficiency of officers of the merchant service by examination, &c., previous to admitting them to commands; and it is generally considered that these gentlemen are now liable to have every disaster to vessel or freight recorded against their prospects of employment and advancement. The Mercantile Marine Act of 1851 contains several clauses of literally vital importance to crews and passengers; and the New Steam Navigation Act of the same year, which has now come into operation, promises to become the means of introducing several material improvements. The former measure contains certain strict clauses providing for the education of officers in the merchant service; the latter provides for the survey and inspection of steam vessels; for the number of passengers they are allowed to carry, of their boats, lights, safety-valves, &c. It also provides against accidents from collision; and indeed appears altogether well calculated to enhance the safety of steam navigation. Whenever these and all other precautions which experience can suggest shall be concentrated into a systematic plan for the protection—*first* of the lives of crews and passengers; and, secondly, for the safety of ships and cargoes, it will in all probability, become a matter of demonstrative proof that the danger of the great waters are in a surprising degree less inevitable than they would appear to be from our present returns of maritime disasters.

It is shewn in the article already cited, that Fire “is, on the whole, with all its appalling attendants, generally little destructive of life, in comparison with its devastation of property. In the great Hamburgh fire of 1842, which destroyed 61 streets and rendered 20,000 people houseless, the casualties to life were only 39. In the Registrar-General’s Returns, the deaths from conflagration are not distinguished from others caused by burning, which are all classed under ‘chemical injuries.’ In the two years 1838 and 1839, there were, collectively, in the the Metropolis, 2,600 deaths attributed to violence, and of these 414 were by fire—136 males and 278 females—the preponderance of the latter evidently indicating ordinary household operations as the chief cause. In



the manufacturing towns of Birmingham, Manchester, Salford, Liverpool, and West Derby, collectively, out of 693 violent deaths, in 1839, 170 were from burning—here 99 were males, and 71 females. The erection of party walls through the roof is supposed now to secure the Metropolis from sweeping conflagrations\* like those which laid waste Hamburgh, and have occasionally desolated the American cities. Among the last, its abundant supply of water must now make an exception of New York. On the other hand, it may be questioned if our provincial wood and brick-built towns are safe from such a calamity." We have already seen, from Mr. Braidwood's Evidence,† that London is still exceedingly ill-protected against fire, as regards water supply. Indeed it is lamentable to watch how absolutely ineffectual the most powerful fire-engines are in a London conflagration which has reached its height. Water can only prevail when promptly employed in vast quantities, almost immediately upon the first outburst of the flames. It is stated that, on an average, half an hour elapses after the alarm of fire has been given before an engine can be set to work upon the burning premises; whereas, by adopting the "constant supply" system, 30 gallons of water per minute can be brought to bear upon the fire in two minutes after it has broken out. It is estimated that, when a very serious fire broke out at Nottingham, after the introduction of this mode of supplying the town, water was poured upon the flames at the rate of 120 gallons per minute. It is also mentioned that, in some factories, the high pressure water-pipe is carried into every room with so perfect yet simple an arrangement that any person, by merely turning a cock, can throw an unlimited quantity of water into whatever portion of the building may be on fire. The cost of the apparatus necessary for this purpose varies from £2 to £4; so that for this trifling outlay, the proprietors of buildings who were accustomed to pay from £200 to £600 yearly for insurance, can save that sum and yet have their property better protected than before. It is added that the great loss of life, frequently caused by fire in dwelling-houses, would

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\* It is stated that the returns kept by the principal insurance offices of the fires which occurred in the Metropolis during the year 1851, exhibit a considerable increase upon those of former years: they exceeded 1,000, and between 400 and 500 houses were for the most part destroyed. On the whole, however, they were not of so extensive a character as those of the preceding year. This is attributed to the working of the new Building Act which requires the formation of strong party walls, and other precautions. The fatal fires are stated to have greatly decreased during 1851.

† Cited in the article on Water Supply.



be avoided by a constant supply of water at high pressure : means could then be furnished for extinguishing fire, equal to an engine and twenty men constantly stationed at every house in every street.\* A great improvement in the condition of English houses, as regards safety from fire, is looked for in the more general introduction of iron-work in domestic architecture. It is also to be trusted that the ingenious plan of Mr. Thomson, surgeon R. N., for lighting ships by means of the refuse fat of the sailors' provisions, recently tested with success on board the "Impregnable," at Devonport, will in future remove that serious danger which always attends the use of candles or movable lights of any description on shipboard.†

XV. *The due Remuneration of the Working Classes (especially in the Manufacturing Districts) ; and the proper Limitation of their Hours of Labour.*

Our present laws visit with no light severity all persons who are found guilty of entering into conspiracy to raise the wages of Workmen ;—that is to say—Workmen are at liberty to agree among themselves not to undertake employment except at a certain rate of remuneration, but no individuals are permitted to combine in order to induce men in employ to leave their work for the purpose of compelling their

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\* *The Metropolitan Working Classes Association's Manual of Public Health.*

† It was stated in the *Times* newspaper for January 3rd, 1849, (as quoted by Mr. Cunningham) that, between the years 1833 and 1848, the average yearly number of fires in London was 644 :—that is, 216 instances of considerable damage or of total destruction, and 428 of slight damage. Mr. Braidwood, the Superintendent of the London Fire Engine Establishment, reported that, in 1849, the number of fires in London was 838 ; 582 of these were slight ; the number of lives lost was 26. In 1850 there were 868 fires, 247 of which were extensive, and 18 casualties occurred.

The large number of casualties among the children of the poor from their clothes catching fire, and from drinking boiling water from the spouts of tea-kettles, gives these accidents almost a foremost place in the list of preventible fatal accidents. It was mentioned in the London papers that, during the last week of December, 1851, no less than five deaths resulted from these causes at St. George's and Charing-Cross Hospitals ; and this occurs constantly every winter, owing to the neglect of parents in not laying out a few pence in providing wire fire-guards, and from there being no obligation on the part of landlords to furnish stoves fitted with boilers at a very moderate additional outlay.

Formerly, the law very wisely refused to regard house conflagrations as unavoidable accidents. According to *Household Words* there existed an ordinance in the reign of James I. which rendered servants liable in cases of accidental fire. "Fine, corporal punishment, and banishment for 3 or 7 years, made it their interest to mind where they (or their masters and mistresses) put the candles."



employers to raise their wages.\* It is unquestionable that this law was urgently called for, in consequence of the many tumults and catastrophes to which the combination system appears to have given rise, some years since, in the manufacturing districts; still,—without entering into any unfair and prejudiced views with regard to the manner in which English work-people are treated by their employers; without for an instant joining in the factious cries which heap upon the heads of the “Cotton Lords” and of the Landed Proprietors all the blame for all the destitution, and ignorance, and preventible disease, which prevail throughout the manufacturing and rural districts; and without overlooking the influence of over-population, of ill-regulated distribution of labour, and of deficient educational and moral training in maintaining an excess of want, sickness, and degradation, among the “masses;”—we may be allowed to hold that some cogent rules are necessary to protect workmen against being systematically under-paid or under-bid, or from being starved into submission to the insufficient rates or the unfair rules of their employers. While it cannot be expected that ten can be paid for doing the work of six, or that the supply of produce can be made to exceed the demand, merely for the benefit of the operative classes, there is nothing unreasonable in the claim of “a fair day’s pay for a fair day’s labour”—*in times when the employers’ profits are large and sure*; nor is there anything unduly levelling in the principle that there must be something constitutionally wrong in the distribution of a nation’s income, when *all* the gold finds its way into one end of the people’s purse, while the baser metals only are discoverable in the other. It would be equally unjust either to argue that the large employers of England are to be regarded otherwise than as a class who generally observe fair dealing—to a certain degree, and according to a certain acceptation of the term—in their transactions with their employees; or to maintain that unjust and grinding masters do not occasionally find a place among them. The State, the Workmen, and their own order, alike require protection against men of this latter class; and it is by diminishing the numbers of this order of men, exceptional as such instances undoubtedly are, that one of the first valid advances would be made towards satisfying the fair and legitimate “claims of labour.” The precise modes

\* See the ruling in a case tried at the Stafford Assizes on the 30th July, 1851.



of protection which would be likely to prove most just and feasible under these circumstances require the knowledge and tact of a statesman for their selection. Indeed, it must be admitted that some high authorities deny, in toto, the practicability of successful legislative interference in securing due remuneration for labour. Be this as it may, it does appear that a well-organized system of centralized jurisdiction, regulating the general conduct of mines and factories with regard to the sanitary condition of the work-people; the state of their places of labour, as regards the security of buildings, machinery, &c.; the number of hours employed in work, and the rates of remuneration; might be brought into operation with very decided advantage. The existence of an authoritative and independent tribunal which should, from time to time, define and regulate, in a certain degree, the rates of remuneration to be given to the various classes of operatives, with due regard to the state of the markets, could not but tend to secure the United Kingdom against the recurrence of those calamitous feuds, conspiracies, discontents, and tumults, which blot our history during the first four decades of the present century.\* Say that the leading feature of this system could not be wrought out under the present constitution of things, it is nearly sufficient that the broad principle of—"the labourer is worthy of his hire"—should have an uppermost place in men's thoughts for a few years to come, and then we may safely foretell that all obstacles will gradually be removed, and the want will be supplied. It is the best feature in the character of the men of the present day

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\* We shall not be suspected of advocating the fallacy that, under all fluctuations of trade, all candidates for employment can be equally and sufficiently provided for; but a great object would be effected could it be ordered that a fair proportion of operatives should be duly remunerated, whenever the demand for labour is really considerable: and it will be perceived how usefully a regulating discipline of this kind might be brought to co-operate with a well-organized Government system of Emigration.

The following may be taken as a fair practical example of the benefits likely to arise from a thoroughly organized plan of arbitration between employers and workmen. It was mentioned, in April, 1852, that the differences which, for some weeks, existed between the master gun-makers and operative stockers and finishers of Birmingham, had at length been satisfactorily arranged, and that, in consequence, the Government contracts for a supply of 23,000 Minie rifles would be immediately commenced. This result was effected by Mr. Westly Richards and Mr. Joseph Bourne, whom both parties agreed to appoint as arbitrators; their decision being that the prices paid by the contractors to the men should be for finishing, 12s.; stocking, 3s. 7d.; making for both branches 15s. 7d.; being 5d. less than the demand made by the men, and 1s. 9d. more than the terms offered by the masters; the latter to be liable for all risks over which the stockers and finishers have no control.



that—although working with a slow and suspicious discretion, and displaying a strong attachment to half-measures as the preliminary tests of the practical working of views which they have long determined to carry out to the uttermost,—they never become aware of a really great and desirable object without resolving to develope it—never wearying of the task until the result is within their grasp.

“Man,” say the scriptures, “goeth forth unto his work, and to his labour until the evening;”—but Night,—the time at which all living things, the active birds, the beasts of burthen—the very trees and the flowers sink into a rest which brings them vigour for the life of the succeeding day—has ceased to be a season of quietude for thousands of the overwrought human beings who labour in our great cities. Shopmen and shopwomen, milliners’ apprentices, tailors’ journeymen and hosts of others,—

———“whose hard toil  
Doth scarce divide the Sunday from the week,”—

must work not only throughout the hours of every “working” day, but far into the watches of every night. Some, as we have seen, appear to be working out the problem of perpetual motion,—

“Sunday brings no holiday to them.”—

The sabbath of Religion may or may not be present in their hearts, but the sabbath of Rest is a thing unknown, until the overwrought mechanism of drooping head, dim eye, and weary hand, falters and stops and crumbles into dust. Many,—as the employees in newspaper offices, journeymen-bakers, &c.,—work throughout the night, and have but little space allowed by day either for rest or exercise. Taken in all its bearings, this system is found to be productive of a vast deterioration in the health and lives of the trading and operative classes.\*

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\* We have already seen how far more destructive pulmonary consumption is among operatives than it is among the richer classes of society—and how little difference there is, in this respect, between the operative and the tradesman. Dr. Guy has further observed that “persons employed in-doors die earlier, attain a lower average age, are more liable to consumption (and those who die of it, die at an earlier age) than persons working in the open air. Some might perhaps be inclined to attribute this superior wholesomeness of out-door occupations not to the purer air, but to the exercise which often accompanies them; but that this is not the case may be inferred from the circumstance that the hawker, who sits or stands about in our streets and markets, and certainly uses quite as little exercise as the majority of persons employed within doors, enjoys the same comparative immunity from consumption, and this despite of his constant exposure to one of its most exciting



For some years, the question of—How far the moral and physical ill effects of the “Late Hour System” are removable?—has received much earnest consideration. It has been alleged, with a certain degree of truth, that workmen are free agents, and are at liberty to engage themselves, if they will, at any conceivable disadvantage:—still, workmen, like most other men, are trammelled with injurious customs, and it is clear that the remedy for this evil is not wholly beyond the reach of society. In that clause of the Factory Act of 1850 which gives from 6 in the morning until 6 in the evening as the hours of labour, the factories closing every Saturday at two o’clock in the afternoon, the Government has shewn both the power and the disposition to legislate humanely and beneficially in this matter (although the first steps of Legislative interference have not advanced so far as to meet the desires of many); and it is to be trusted that similar regulations will hereafter be enforced in respect to the early closing of retail shops,—as well as to the discontinuance of night-labour in milliners’ and tailors’ work-rooms, and in bakeries, &c. Disappointed vanity may find its consolation in patience, or in ready-made garments; and discontinuance of the bad habit of eating hot bread will prove conducive alike to economy and to digestion.\* It has been practically

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causes—cold.” Dr. Guy has found from experience that “liability to consumption occurs earlier in sedentary employments than in those requiring more exertion; and in the latter, again, than in those requiring great exertion; that the deaths from all causes follow the same rule; and that the average at death is lowest in the sedentary class. There is abundant proof that in employments carried on in-doors, exercise has a most beneficial effect. This is illustrated by the case of the compositor and pressman. They both breathe the same kind of air, in rooms similarly constructed, warmed and lighted; they resemble each other, in fact, in everything but the amount of exertion they employ. A comparison gives the striking result, that while the compositor suffers from attacks of consumption in about  $3\frac{1}{2}$  of all other diseases, the pressman is liable to only 1 in 5.” Still, this excellent observer proves, as might have been anticipated, that, apart from consumptive disease, too much exertion is not less destructive to life than is too great confinement. Dr. Guy has further alluded to the relative amount of injury arising from want of exercise and foul air. “It is an acknowledged fact, that consumption can be produced in animals by confining them in a hot and foul atmosphere; which is equivalent to consigning human beings, and especially the young, to sedentary occupations in ill-ventilated workshops. The labourer at 30 years of age has an expectation of  $40\frac{1}{2}$  years; the clerk of only  $27\frac{1}{2}$  years—a difference of no less than 13 years; and does not this speak volumes in favor of air and exercise? and does it not force upon us the duty of striving with all our might and means, to secure for the poorer inhabitants of large towns facilities for exercise and pure air, of which a long course of negligence has deprived them?”—*Lectures delivered before the Liverpool Mechanics’ Institution.*

\* During the great scarcity of wheat in 1801 it became an established rule that no bread be vended which was less than a day old.



demonstrated that an absolute advantage accrues to the employer where he wisely permits the energies of his workmen to become refreshed by allowing due time for sleep, meals, and exercise.\* Nothing can be more palpably false, as regards the main bearings of this question, than the often-reiterated argument that, in the majority of instances, additional leisure would merely afford an opening for idleness and dissipation. A little indolence, an occasional return to the unrestrained joyousness of childhood, are privileges which indulgent nature has granted for the invigoration and rejuvenescence of every human being. No one escapes wholly from the penalty of living by the sweat of his brow;—but it is man—not God—who has decreed that the toil of some shall have no intermissions, save those which utter exhaustion demands;—that the workman must live and die in harness, without relaxation or release, until,—

“He his worldly task has done,  
Home is gone, and ta'en his wages.”

Dulce est desipere in loco.—Work or starve, is the universal law; but, now and then, a few hours spent with the Muses, or employed in unrestrained physical exertion, or passed in intellectual converse or in chat, or in mere hilarity—as the case may be;—now and then, a day loitered away in the blessed sunshine with the mind and the hands at rest, and the senses free to rejoice in the odour of the flowers and the ringing of the waters:—

———“in the calm of mute insensate things  
“The breeze of Nature stirring in our soul;”—

and then the over-laboured brain and the unnerved muscles will gain vigour and activity for the tasks and the trials which are gathering for the days to come.† It is as self-evidently unfair not to allow the artizan or the shopman due intervals for sleep and exercise, on the pretext that such time will be wasted or misused, as it would be to withhold his wages on account of his habits of extravagance or excess. “I can make better use of your leisure than you would,” is an argument which can hold only between the slave-driver and the slave:—the employers of free men, in the nineteenth century, should have had the sense, if not the decency, to withhold it.

\* See *Chambers' Journal*, N. S., vol. iii., p. 412, for some excellent practical remarks on this subject.

† “If ever a people,”—says the benevolent Mr. Helps—“required to be amused, it is we sad-hearted Anglo-Saxons. Heavy-eaters, hard-thinkers, often given up to a peculiar melancholy of our own, with a climate that, for months together, would frown away mirth if it could—many of us with



XVI. *The Opening of Baths, Wash-houses and Places of Exercise, for the Use of the Working Classes in the vicinity of Crowded Cities and in Manufacturing Districts.*

All the moral and physical aspects of every land combine to illustrate the platitude that "God made the country, but Man built the Town." The open plains and the breezy hill-sides are the natural and fitting scenes of man's labours. His physical vigour and his moral sense alike deteriorate in scenes where not even the ground he struggles on, nor the atmosphere he breathes, deserve to be termed "God's Earth" and the "Air of Heaven."

However their tastes may have become sophisticated by city existence, men of all grades and races continue to retain about them evidences of the truth, that the wisdom of the Creator originally cast the lot of the first of our race in the midst of a garden. The green-house jutting out from the swarthy front of the "town-residence;" the brightly laden flower-stand in the city trader's parlour; the rich, fresh, nosegay on the judge's desk; the single moss-rose lying beside the folios of the copying clerk; the lily of the valley which no amount of diving through the press in Threadneedle Street can detach from the stockbroker's button-hole; the tiny box of mignonette in the weaver's casement—all denote that green foliage and sweet blossoms are among the essentials of our existence, and that their aspect and their odour alike exercise a kindly influence upon our senses, at once refreshing and humanizing us by their grateful presence.

" God has not given  
This passion to the heart of man in vain  
For Earth's green face, th' untainted air of Heaven,  
And all the bliss of nature's rustic reign.  
For not alone our frame imbibes a stain  
From fætid skies; the spirit's healthy pride  
Fades in their gloom."

Still, unhappily, necessity, "utility," and design, have alike combined to crush out every green spot from our large cities. London has been especially unfortunate in this respect:—the pleasant meads of Clerkenwell, the Convent Garden, the Long Acre, Spring Gardens, the Mulberry Gardens, and May Fair, have, for centuries, been known only as densely-built districts of a crowded city. So also Islington Fields,

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very gloomy thoughts about our hereafter; if ever there were a people who should avoid encreasing their dulness by all work and no play, we are that people. 'They took their pleasure sadly,' says Froissart, 'after their fashion.' We need not ask of what nation Froissart was speaking."



Mary'bone Gardens, Moorfields, and St. George's Fields, have, in like manner, disappeared before the progress of modern "improvement." To attempt to discover a single wild flower within the precincts of either of those once famous breathing places, would be as forlorn a task as to search for the Maypole by St. Andrew's Undershaft, or to attempt to recall the freshness of "Bucklersbury in Simple Time." Beyond this, even a very "little knowledge" of vegetable physiology has, of late years, given rise to an ignorant crusade against the few ancient trees which had withstood every aggression in many parts of our great cities. Plants are liable to give out carbonic acid at night,—carbonic acid is a deadly poison,—therefore every tree and shrub in the neighbourhood of our dwellings is to be regarded as a very upas, and must be eradicated accordingly! Besides the advantages derivable from the shade and shelter of trees, and their influence in cooling the atmosphere during the heats of summer, these noble plants, in a temperate climate, and when not too densely placed, naturally absorb infinitely more carbon than they exhale. They, and all the earth which surrounds their roots, must be regarded as vast magazines of effete carbonized matter secreted from the carbonic acid of the air; and, under all favorable circumstances, trees are to be viewed as great and invaluable eliminators of oxygen for the supply of men and animals. It is only where vegetation is excessive, as within the tropics, and where the decay of plants is equal to their growth, at seasons when the air is heated and motionless, that trees can be regarded as inimical to the health of man. Upon the whole, these, in themselves, very common-place facts are beginning to be practically acted upon in most of our principal towns:—on the Continent, they have scarcely anywhere been overlooked. Within a few years, we may hope to find in the near vicinity of every manufacturing city, parks and gardens\* open to the working classes which shall rival in freshness and beauty, if not in costliness and extent, the delightful shades of Saint Cloud

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\* Reference has already been made to the benefits which result from supplying town labourers with opportunities of indulging in horticultural pursuits. The practice has long been followed in the manufacturing town of Nottingham. Mr. Howitt states in his *Rural Life of England*, that there are in the outskirts of that place, upwards of five thousand gardens (about one to every 10 inhabitants) averaging less than a tenth of an acre in extent, and that the larger proportion of these are occupied by the working class. The mechanics pay at rather a high rate for these plots of ground—"but then they get the health and the enjoyment, and their fruit and vegetables are so fresh."



and the Trianon; while in its Victoria, Battersea, Hyde, Regent's, Green, St. James's, Smithfield, and other Parks, all opening by turn-stiles, not by pass-keys—London of the nineteenth century may become nearly as well furnished with places of exercise for its citizens, as Fitz-Stephen found it some five hundred years ago. It will be indeed a fortunate time for the murky city, when the over-worked tailor, the hollow-eyed weaver, the consumptive penman—

“a prey  
To sallow sickness, which the vapours dank  
And clammy of his dark abode have bred,  
Escapes at last to liberty and light:  
His cheek recovers soon its healthful hue;  
His eye relumines its exhausted fires;  
He walks, he leaps, he runs—is wing'd with joy,  
And riots in the sweets of every breeze.”\*

*Baths and Wash-houses.*—Without attempting to rival the fame of that venerable Court Physician, Master John de Gaddesden, which mainly survives upon the record—that “he invented divers modes of keeping people clean”;—medical men

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\* Mr. Chadwick mentions, in *The Sanitary Report*, that “on the holiday given at Manchester in celebration of Her Majesty's marriage, extensive arrangements were made for holding a Chartist Meeting, and for getting up what was called a demonstration of the working classes, which greatly alarmed the municipal Magistrates. Sir Charles Shaw, the Chief-Commissioner of Police, induced the Mayor to get the Botanical Gardens, Zoological Gardens, and Museum of that town, and other institutions, thrown open to the working classes at the hour they were urgently invited to attend the Chartist Meeting. The Mayor undertook to be personally answerable for any damage that occurred from throwing open the gardens and institutions to the classes who had never before entered them. The effect was, that not more than 200 or 300 people attended the political meeting, which entirely failed, and scarcely 5s. worth of damage was done in the gardens or in the public institutions by the work-people, who were highly-pleased. A further effect produced was, that the charges before the police of drunkenness and riot were, on that day, less than the average of cases on ordinary days. I have been informed of other instances of similar effects produced by the spread of temperance pleasures on ordinary occasions, and their rivalry to habits of drunkenness and gross excitement, whether mental or sensual.” This is certainly an interesting and suggestive fact, and one which is well calculated to tell strongly in a popular lecture; but the examples of our continental neighbours would lead us to fear that the humanizing effects of mere æsthetics soon wear off, and that the solace derivable from gardens and picture-galleries would alone have but very little power in diverting the minds of a ferocious and uneducated rabble from designs of lawless violence. The shot-holes in the pictures at the Louvre tell us plainly that something far higher than the faculty of appreciating the beautiful in art, is required to make men good and peaceful citizens. Still, without giving it undue weight, this must be viewed as one among the many constituents of a feasible system for the improvement of the physical and moral condition of the industrial classes.



of the present day are unwearied in inculcating the vital necessity of maintaining the healthy action of the cutaneous surface. Every one is aware that the skin is naturally an outlet for abundant secretions which cannot be suddenly checked or retained without great disturbance in the action of internal organs, and with almost immediate risk to life, and which cannot be gradually impeded and suppressed without the retention of much noxious matter in the system, and the consequent maintenance of undue excitement in every viscus. In all climates, and at all seasons, deficient perspiration is known to be among the gravest of the cases of pulmonary, cardiac, hepatic, and renal diseases, of certain fevers, of dysentery, and of rheumatism in all its most painful and destructive forms. A freely and healthily perspirable condition of the skin is especially recognised as one of the greatest safeguards against disease in pestilential climates;\* and it is, of course, absolutely impossible that the skin can throw off its due excretion of many ounces of fluid daily, so long as its pores are encrusted and obstructed by thick layers of effete scurf-skin which profuse and frequent ablution can alone remove.†

It is perhaps scarcely to be ascribed to the civilization of the Greeks and Romans that, following the example of the Asiatics, their cities became filled with public and private baths of the most gorgeous and luxurious description. Living in a hot and relaxing climate, frequent bathing suggested itself as a natural want, and gradually degenerated into a mere pretext for indolence and sensuality.‡

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\* My friend Mr. W. F. Daniell, the distinguished topographer of the west coast of Africa, told me that, soon after his arrival in the country, one of the native chiefs, on grasping his hand, declared that he would remain healthy—his skin was not dry. Until near the close of his first five years in Africa, Mr. Daniell enjoyed almost entire freedom from illness.

† The ancients were not satisfied with the use of the bath alone, they also employed the strygil to scrape away the exuviae from their bodies.

‡ We find that in the time of Rome's greatest splendour, the city boasted of no less than 754 private, and 10 public baths. Much valuable and curious information on this subject may be gleaned from the *Traité-complet des Bains*, by M. Corbel Lagneau. It appears that, at first, the public baths of Rome were opened at two in the afternoon, and that they were closed at five; the sick alone had access to them at all hours. The Emperors, however, endeavoured to gratify the people by ordering that the baths should remain open for longer periods. Nero commanded that they should be entered at twelve, and Alexander Severus threw them open at day-break, and lighted them at his own expense. Nothing could exceed the splendour of the public thermæ:—the richest marbles, porcelain and bronze, the noblest statuary, columns, vases, fountains, and paintings, enriched their glorious halls in almost inconceivable profusion. The fact that the thermæ of Diocletian contained three



In most Eastern countries public baths have always been considered as among the essentials of existence, although the Orientals generally are far from deserving that character for cleanliness which prejudice has conceded to them. In Turkey and Egypt, and in Morocco, the practice of warm bathing is carried to excess. In China, although fuel is somewhat costly, the poorest workman may obtain a warm bath at the lowest conceivable expense.\* In India, the tanks and rivers are now the only bathing places of common resort, but, during the period of Mussulmaun rule, public baths were not wanting in the principal cities. Most of the large continental towns are tolerably well supplied in this respect; but, until very recently, the means of personal cleanliness have been entirely beyond the reach of the poorer classes throughout nearly the whole of the European cities. A recent Act of Parliament,† however,—proceeding upon the results of experiments tried at East Smithfield by certain benevolent individuals, among whom Mr. Robert Bowie, a surgeon, deserves especial mention,—has provided for the establishment of Baths and Wash-Houses for the labouring classes, in the large manufacturing towns of England: and we now have statistical evidence of the somewhat encouraging fact, that about one-third of the inhabitants of London enjoy the luxury of a bath, *once* in the course of a twelvemonth.‡ This would, certainly, not be regarded by

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thousand recesses for bathers, may afford a conception of their vast extent. Luxurious extravagance was carried even still further in the decoration of private baths. Pliny reproved the ladies of his time for covering the floors of their baths with silver.

\* It was mentioned some time since in the *Athenæum*, that, in the town of Shanghai, as well as in many other large Chinese towns, there are a number of hot-water bathing-establishments, in which the visitors who use the common room pay six copper cash, or about one farthing; while the other class pay eighteen cash, but they, in addition, have a cup of tea and a pipe of tobacco, in a private room, from the proprietor.

† This Act was passed in August, 1846.

‡ From a statement published in 1851 by the Committee for the establishment of baths and wash-houses for the laboring classes, it appears that, "Taking the whole of these London establishments, the bathing is now going on at the rate of nearly 700,000 a-year; and when those for the parishes of St. James, Westminster, St. Giles, and St. George, Bloomsbury, and Poplar, now in progress, are completed, it will soon exceed 1,000,000 a-year. By far the greater part of the baths taken are of the second class, the charges for which (in accordance with the Acts of Parliament) are 1*d.* for a cold bath, and 2*d.* for a warm bath. When the Committee for promoting the establishment of baths and wash-houses for the laboring classes was formed, the lowest general charge in London for a warm bath was 1*s.* 6*d.*—a price which made a warm bath too expensive a luxury for a laboring man. The charges for the first-class baths are 2*d.* for a cold bath, and 6*d.* for a



the Brahmins of Benares as a remarkable advance in the practice of cleanliness:—still, it must be received with complacency as “an evidence of progress.” Bathing has, for some years past, formed an essential portion of our Jail discipline; and it would be gratifying to learn that baths had been furnished for the use of the work-people in all factories, mines, potteries, foundries, and other great industrial establishments. No decent workman would be insensible to the beneficial effects of soap and water on his own begrimed and heated person; and no one who has entered a close and heated work-room can doubt that, as regards purity of air, personal cleanliness is not less essential to the “masses” than ventilation itself.\*

warm bath. In all essentials, a first-class warm bath for 6*d.* is as good as a warm bath for which from 2*s.* 6*d.* to 3*s.* 6*d.* was the general charge when the Committee was formed. These public baths are made use of by persons of all grades in society, from the poorest dirty boy who picks up his living in the streets, and scrapes together 2*d.* for a thorough cleansing in a second-class warm bath, to members of each House of Parliament, who are well satisfied with the comfort of the sixpenny first-class warm baths.”

It was stated that the following were the number of bathers for the week ending 16th August, 1851, at the undermentioned establishments:—Model Institution, London 5,668 bathers; Establishment, St. Martin's in the Fields, 7,175; St. Marylebone, 7,728; St. Margaret's, 5,117; Liverpool Establishment, 5,489; Birmingham, 4,032; Hull, 2,311; Bristol, 1,634; Preston, 1,217.

\* A Writer, in 1847, says,—“I am engaged among the middle and working classes, and as I see many opportunities of doing good suffered to pass away, I feel called upon to write a few hints, in the hope they may lead to good. I have been actively engaged for some years in getting up Mechanics' Institutions and various schemes to improve the condition of the people, and I must speak of some of the causes which prevent the good from being done. We find that, after all our efforts, the workmen seldom attend our rooms. They state that they are too tired and unclean, and consequently drop in at the low public-house or beer-shop, and squander their means; adding to their difficulties, and causing misery to their families, and vexation and loss to their employers. I know of a large foundry employing fifty hands, but none of them come to the institution designed for their benefit, as they leave their work in a black, dirty state, and doubtless much exhausted. Now I think I could suggest an important improvement to the employers of these and similar men, and it has this advantage—*that it is easily put in practice.* To the foundry and most others, a steam engine is attached, the waste water from which would make a convenient and useful bath for the men; only a very small outlay being required. The baths may be fitted up by the master, and some trifling payment, 1*d.* per week, perhaps, deducted to repay the cost. The men might wear to the shop a decent clean suit of clothes, and put these on at night after a bath, and thus be comfortable to spend the evening at the institution. Such a movement would greatly improve the health of the men, and lead them to be steady good workmen, no small treasure to employers. Messrs. Cubitt (the builders) and Seddon have partially tried this with success. Employers! do this duty to your fellow-men, and you will be amply repaid.”



XVII. *The Establishment upon an Extensive Scale, throughout the Country, of Houses of Temporary Refuge for the Destitute, where Medical Aid may be received, as well as Assistance in obtaining Proper Employment.*

Among the numberless vices and injustices with which the old monastic regime of England was fraught, there shone out one bright redeeming point, in the thoroughly benevolent system of alms-giving universally practised by the religious houses. Before the Reformation, there was scarcely a valley, throughout the length and breadth of the land, in which the weary and friendless traveller could not discover a Norman portal ever open to afford him a bench, a stoup of ale, and a muncheon of bread, and a *bien'cite* to speed him on his way.\* Now, the uncertain and degrading relief of private alms-giving is the only resource of the absolutely poor, but not yet demoralized, wayfarer. In the country, such an unfortunate must find his rest at night in cow-sheds, under the lee of haystacks, or within the deadly warmth of lime-kilns; in cities, his only places of refuge lie under market-stalls, in the dry arches of bridges, or, still worse, in lodging-houses, where the transition from poverty to vice and dishonesty is almost inevitable. When once awakened to the actual want of those who seek it, English charity is, in truth, a glorious virtue. No individual was ever publicly *known* amongst us to be positively in want of the absolute necessities of life without having many ready hands outstretched in every direction to assist him:—but it is those who are ashamed to beg—those who cannot succeed in making their distresses known, and those upon whom utter want falls so suddenly that they are unable to ascertain in what quarter relief might be obtained before starvation reaches them;—who fall victims to that apparently most easily preventable of all deaths—death from cold and want of food—in the wealthiest and most civilized land that the world has ever seen.†

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\* Since the time of Stephen, bread and beer have been supplied to every stranger seeking such refreshment at the Hospital of St. Cross, near Winchester. In like manner, worthy Richard Watts founded an alms-house in Rochester, where—"six poor travelling men, not contagiously diseased, rogues, nor proctors, may have lodging one night freely, and every one four pence in the morning."

† It was reported that, in 1838, the deaths from *starvation*, within the registered districts, was 167; in 1839, it was 130; and in 1840, 137.

"We talked of the state of the Poor in London. Johnson: 'Saunders Welch, the Justice, who was once High Constable of Holborn, and had the



Of late years, a few "Night Asylums" and "Refuges for the Destitute" have been opened in the chief towns of the United Kingdom.\* But, even in the Metropolis, there are still hundreds who daily pace the streets craving for food, and unable to guess where they are destined to lay their heads at night. It is true that, by applying at any of the Police Station Houses, unfortunates of this description may usually obtain temporary shelter; but this proceeding evidently carries with it a strong discouragement. What is actually required is the establishment, in every large town, as well as in many of the principal country villages, of substantially but inexpensively built, and thoroughly warmed and ventilated, edifices capable of receiving say one per cent. of the gross population of each place, and sufficiently well-endowed to be able to afford two pounds of bread and two basins of gruel tea, or coffee, with the accommodation of a couch and rug to every destitute person who may seek the boon of a night's lodging. The difficulty of deciding who are in reality proper objects of charity is decidedly great; but it does not appear likely to stand much in the way here. Each Refuge might employ two or more veteran policemen of well-proved character and

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best opportunities of knowing the state of the poor, told me that I under-rated the number when I computed that twenty a week, that is, above a thousand a year, died of hunger; not absolutely of immediate hunger, but of the wasting and other diseases which are the consequences of hunger. This happens only in so large a place as London, where people are not known."—*Boswell*.

\* To Scotland especially belongs the honor of instituting, upwards of ten years since, several establishments in which the otherwise houseless poor are provided with shelter and food for a single night. The first houses of the kind were those at Glasgow and Edinburgh. We learn from *Chambers' Journal* that a similar asylum was established at Selkirk in February, 1843. Early in the following December, it was stated that 1,833 persons had been received into it, at an expense of little more than £24, the further sum of ten guineas having been expended in previously fitting it up. This is about three pence each person for shelter and two meals. The inhabitants speedily found that this little institution had not only done much good amongst the poor, but had gone a great way to suppress begging in the town and neighbourhood. In the same year, the formation of similar establishments in London was very strongly advocated by the *Times*, *Atlas*, and other influential public prints; and a "Refuge for the Destitute" was opened in Shoreditch during the cold season. One of the first refuges of this kind in London was that near Whitecross Street, which was established towards the end of 1841. For some years past, a more permanent institution, for the reception and employment of Destitute Females, has been in operation at Dalston. This refuge now receives about eighty inmates. It appears from the *Charities Report* for 1850, that, in this year, the total number of inmates received was 89, of whom 20 had gone to service, and others had left from various causes. The whole of those who had gone to service, with three exceptions, were acting in a most creditable manner. The ordinary income of the year, including the last grant of £1,000 from the Government, had amounted to £2,507, and the expenditure to £2,111.



intelligence; one of these experienced persons, being always in waiting to receive applications for admission, would rarely fail to distinguish, with instinctive acumen, between the really distressed stranger, and the professed beggar or "loafer." In any case of doubt these guardians of the Refuges should be instructed to lean to the side of mercy. Such establishments would seldom be chosen as the resorts of thieves and professional beggars; and, in extreme cases, a distressed thief or an unsuccessful tramper might occasionally find a night's shelter there without violation of the purposes of the Charities. Every Refuge should be able to command the attendance of a qualified surgeon, in cases of sudden illness; and in large towns, it would be well that a rule should be established for the immediate admission into the nearest hospital of any individual who might be sent thither from the Refuge bearing the medical officer's certificate of severe illness. It appears probable that temporary asylums of this kind might readily be made the means of obtaining employment for large numbers of industriously inclined, but destitute persons. It is a recognised fact that the difficulty experienced by employers in engaging active and competent workmen is often as great as the difficulty which the industrial poor generally meet with in getting employment when suddenly thrown out of work. As the captain of a merchantman sends to the Sailors' Homes and Lodging-Houses, whenever he is short of hands, so the Mason, the Builder, the Tailor, the Contractor for the Repair of Roads, and many other employers, might be expected to seek for workmen at the principal Night-Asylums. A strong prejudice against this practice might be anticipated at first—masters would be unwilling to employ "riff-raff picked up in the streets"—but, in course of time, this feeling would doubtless yield before evidences of the positive utility of the practice. The example of a few enlightened employers would soon give currency to the system. A bricklayer has contracted to build a house within a given time—half a dozen of his labourers strike—hands are scarce—to-morrow's work threatens to come to a stand-still—he will be by no means unwilling to have six able-bodied hodmen sent to him from the Night-Asylum, and will not find fault with them because they are ragged and unshorn, and do not carry their "characters" in tin cases. Employers might be allowed to send in daily memoranda, stating the description and number of men required, and the daily rate of wages offered; these memoranda, being



affixed to a board, should be read over to the inmates immediately before their evening meal, when volunteers would be furnished with the addresses of their future employers. Nothing can be conceived more forlorn than the condition of a really industriously-disposed labourer or artizan discharged upon the world after a tedious illness in one of the great public hospitals:—days, perhaps weeks, are spent before he meets with an employer who is in need of his services. The officers of the Asylums might, in many instances, confer the greatest benefits by allowing persons of this description to attend at the hour of reading the application list, or to enter their names in the Asylum books, as candidates for employment, without receiving other assistance. It is a fortunate characteristic of the age that, whenever an impetus is given to the undertaking of any indisputably good work, the means of effecting the desirable object are rarely wanting. Heavily taxed as it is, the public charity of England may be regarded as almost boundless, and we may fairly trust that, where it has been found equal to the outlay of millions for the redemption of African slaves, it will not, for many years longer, fail to afford a shelter and a crust to every individual who is threatened with death from exposure and starvation upon his native soil.

XVIII. *The Introduction of Better and more Liberal Rules than are at present in operation, for the Medical Relief of the Destitute Sick; and for the Support of Incurable Patients.*

It is a great and a cheering fact that the Metropolis of England supports nearly a hundred institutions in which the diseased poor receive medical aid at the public expense; that these hospitals and dispensaries are maintained at an annual outlay of nearly two hundred and fifty thousand pounds; that upwards of seventy of their number have arisen during the present century; and that twelve of the principal establishments yearly admit about 3,500 in-patients, and afford relief to nearly a million of out-patients.\*

Still, every institution of human devising has its defects and blemishes; and it must be admitted that, great and useful as our Medical Charities are, their administration involves

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\* In his work on *The Charities of London*, Mr. Sampson Low enumerates (1850) 12 General Medical Hospitals; 50 Medical Charities for specific purposes; and 35 General Dispensaries—which are supported by an annual income of £243,944.



several radical evils for which strong remedies are urgently required. The matter is a painful and a delicate one for a medical man to deal with;—yet, when it is considered that one-sixth of the inhabitants of London die in the wards of its Hospitals, Work-Houses, and Lunatic Asylums, the concealment of any known and removable error in the management of those Houses would be an act of cowardice which no amount of reproof could adequately punish. The blemishes in the administrative system of our principal medical charities lie considerably below the surface, and are scarcely detectable except under a very rigid and searching examination. It is known to every one that most of the London Hospitals are palaces for the reception of the sick; that every necessary is provided for the inmates; that the non-medical governors, treasurers, and other authorities, are almost universally men of high social standing and unblemished honor; and that their medical staff includes nearly the whole of the most distinguished professional men in the Metropolis. Where, then, are the grave defects to which allusion has been made? They are mainly embodied in these facts,—that the system of electing the medical officers is faulty;—that the management of the institutions is essentially independent of medical control. Again, we find that the evidence of the justice of these propositions lies far beyond the glance of the superficial observer. What, it will be exclaimed, can any caviller allege against the judgment which selected such men as Harvey, Cheselden, Hunter, Astley Cooper, Abernethy, Pott, Key, Cline, Liston, Morgan, and a host of others whose names now form part of our country's history as the Physicians and Surgeons of the Poor? Can he or any other critic impugn the choice of those who have confirmed Brodie, Green, Lawrence, Bright, Williams, Addison, Hodgkin, Babington, Bransby Cooper, Cock, Barlow, Hilton, Fergusson, Hughes, Partridge, Rees, Solly, Walshe, Burrows, Curling, Latham, Golding, Bird, the Arnotts, Stanley, Guthrie, Theophilus Thompson, Budd,\* and a score of other great and learned men now living, as the successors of the masters of our art? Could human judgment have been more wisely directed than it was in these instances, and in very many other instances, resembling these? The reply is—certainly not—still, the defects which mark the present system of

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\* It has not for one instant been intended to render the above list exclusive; the author has merely given for example's sake a few of the distinguished names which first occurred to his mind.



election go far beyond its merits. No medical body had a really active voice in the selection of any one of these eminent persons. It cannot be argued that medical authority was not in any way consulted in their election. In societies, where every one's reputation is known to every one, it is not remarkable that the really meritorious should attain distinction—still, where the dispensers of high places are not, in themselves, competent judges of the respective merits of the candidates, (personal feelings and interest being, if possible, entirely set apart) it will generally happen that a certain amount of glaring error must occur in the selection; and that, even allowing that sterling merit is the chief qualification sought for, *the wrong kind of merit* will, from time to time, be chosen. It is unnecessary, and would be invidious, to attempt to seek examples from the present time;—it is merely proper to say that the system of hospital election by governors and treasurers has remained unchanged for many years. Any surgeon who was well acquainted with the Metropolitan Hospitals, ten or fifteen years ago, will remember that their medical staff then included a considerable proportion of the very best physicians and surgeons that the world could produce, and that there was scarcely one of their medical officers who was not, in some way or other, a man of remarkable attainments;—it is painful to add that a few of the worst practical surgeons in England also found a place among them. In the selection of the whole of these gentlemen, two points had been observed:—first, they had commanded sufficient extra-professional interest to enable them to procure their election; and, secondly, they had possessed, in a greater or less degree, an amount of reputation which might be considered as justifying their non-medical friends in the choice which they had made. Whoever was then in the habit of visiting the great hospitals must retain, mingled with many gratifying recollections, a vivid remembrance of the fact that, in more than one of those institutions, instances of lamentable incompetency were almost daily exhibited. The Operating Theatre was of course the point at which this incompetency became most publicly egregious—and words can scarcely express the painful character of the imbecility, rather than ignorance, which, from week to week, and from year to year, was permitted to display itself in that arena. I have frequently wandered away from my own noble school, and, gaining access to some hospital on the operating day, have stood beside men who were evidently practitioners from the country, or foreign surgeons;



and, glancing from time to time at the working muscles of their pallid, shocked, impatient countenances, have hardly restrained myself from exclaiming,—“This is not a fair specimen of London Surgery.” Happily, the instances of such incompetency as this were not very numerous;—it is scarcely possible, however, to calculate the mischief which even one man, essentially and constitutionally unfitted for the duties of an operating surgeon, may inflict while holding a responsible position during a long series of years, daily reversing the adage, that—

“A wise physician, skilled our wounds to heal,  
Is more than armies to the public weal.”—

It has been only with the strongest reluctance that I have brought myself “*ambiguas spargere voces*” regarding an evil which has long been manifest as the greatest blemish in the administration of our medical charities. I believe that the above remarks are not calculated to throw the slightest slur upon the professional character of any hospital physician or surgeon of the present day:—still, while the system of election to medical appointments by irresponsible non-medical bodies remains unchanged, it is evident that the public are always liable to have the injuries resulting from a faulty and injudicious selection forced upon them. The cure for this abuse is evident;—the financial management of the medical charities should still devolve upon the non-medical governors and treasurers of those institutions—but the entire duty of providing medical and surgical officers should rest with the Profession. The manner in which such selection could be most advantageously made, whether by public *concours*, by the votes of the Members or Fellows of the Colleges of Physicians and Surgeons, or by the decision of professional censors deputed by the medical corporate bodies, under the sanction of Government, to examine into and to regulate the affairs of the medical charities—is a question of secondary importance. The principle contended for is—that no one should be elected to, or be permitted to retain, the office of Physician or Surgeon to a Public Hospital who is not proved, *by the fiat of his own class*, to be mentally and physically equal to the great and onerous duties which that position demands.\* It is not probable that these changes

\* The details of the required reform cannot be advantageously discussed within our limited space. It appears desirable, however, that the present incumbents of medical appointments should be allowed to remain in office for five or ten years; and that, subsequently to this all such elections should be



would meet the views of the present extra-professional managers of our great charities;—still, the united voice of the Profession appealing to the Government and to the sense of the public for an improved system could not long fail to command attention. It is to be remembered that about seventy-one thousand pounds—or nearly one-third of the entire sum devoted to that purpose—is annually subscribed by the public for the support of the London medical charities. There can scarcely be a reasonable doubt that the hospitals and dispensaries, which these funds maintain, are managed with strict integrity, as far as their financial regulation is concerned;—it is the duty of the subscribers also to provide that they shall be ruled with judgment, and with absolute regard to the welfare of the sick. In the cases where dispensaries are supported by subscribers of one or two guineas annually, there might, at first, be some diminution in the funds when it became decided that the subscribers should no longer exercise the right of voting in the election of Medical Officers. Still, but little permanent aid to any good work can be expected from men who give to a charity merely for the sake of exercising a fractional portion of authority in its management. The guineas of such persons could be spared without regret.

England is assuredly fortunate in the number of its richly-endowed colleges and alms-houses for the reception of the aged poor; and is by no means deficient in asylums for the education of the deaf and blind\*,—but the country is singularly ill-supplied with *Hospitals for Incurables*. “They

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made quinquennially by the Profession. Up to a certain age, each medical officer would, of course, be eligible for re-election, except under particular incapacitating circumstances. It would be very desirable that the physicians and surgeons of the richer hospitals should be salaried and resident. With very moderate fixed salaries, and the right of lecturing, of taking pupils, and of receiving consultation visits, men of first-rate ability and efficiency would find it well worth their while to remain in connection with the hospitals during ten or fifteen of the best years of their lives, resigning so soon as the increase of their private practice should enable them to do so. All medical men, on ceasing to act as the physicians or surgeons of these institutions, might be enrolled as consulting physicians or surgeons—a mere title of honorary distinction in the cases of retired or inefficient men—an office of sterling importance when occupied by men of activity and eminence. Still, as long as sight, or hearing, or voice, remained to them, men whom the Profession had chosen as the medical officers of the chief hospitals in the country could never cease to give valuable aid in consultation.

\* It appears from the authority already quoted that there are, in London, 103 alms-houses, colleges, and other asylums for the aged;—possessing a total annual revenue of £83,047; and 14 institutions for the blind, and deaf and dumb, supported by an income of £7,246.



order those things better in France." Indeed, all thought of such provision appears to have nearly passed away from our minds since the ancient Lazar-Houses ceased to be required. It has certainly been found that there is scarcely any degree of original bodily defect, mutilation, or life-long physical infirmity, that absolutely precludes its victim from employing some exertion for his own support. The instances of the celebrated Miss Biffin, and of Thomas Englefield, who painted and wrote with their mouths; of the almost equally famous Miss Hawtin who cut watch-papers with her toes; the Paaps, Hauptmans, and Boruwlaskis, who exhibited themselves, and rose to eminence as dwarfs; the O'Briens, Cookes, and Tollers, who amassed fortunes by virtue of their gigantic height;—sufficiently exemplify this evidence of the Creator's all-wise and ever-guiding benevolence. Still, there occur, from time to time, in every hospital, diseases which, although of almost unmitigable severity, allow the sufferer a protracted respite of miserable existence, ere death puts a period to his trials. Without friends, or employment, or physical or mental energies at their command,—nay, without any certainty whatever that the remainder of their earthly probation will be endured under the shelter even of a work-house roof,—such unfortunates must pass forth into the streets to make a few more agonizing struggles for subsistence, and then to be speedily overtaken by death. This is especially the case with individuals suffering from organic diseases of the heart and lungs, and of certain other internal organs. With care and rest, and well-regulated diet, these persons will sometimes wear on for several years after their maladies have been perceived to be incurable; while even an ordinary degree of fatigue and exposure would evidently destroy them in a few weeks or days. Such unfortunates are assuredly objects for compassion :—they do but

“Seek a little breathing-space between this and the grave.”

Ten or twenty HOSPITALS FOR INCURABLES would prove essential blessings to the United Kingdom :—the only hope, however, of obtaining these must rest upon the possibility that wealthy and benevolent persons may be brought to consider such an object deserving of support by donations and legacies. It is an unfortunate, and often signally unjust, spirit of criticism which strives to discover the evidences of callousness, and of unchristian resentment maintained even unto death, in the dispositions of those who, overlooking the assumed claims of distant kindred, will their property away



to institutions of national charity. It is surely wiser and more just to consider that there must be something righteous and exalted beyond the common in the minds of those who adopt so beneficial a course. At all events, the world should learn to view indulgently the error which leads a man to think it better that the sick of his city should ever more be ministered to by gentle and skilful hands, than that his nephew the gamester should have so many thousand chances more of cursing over the losing dice.

XIX. *The Establishment of Judicious Systems for the Reduction of the Mortality in Lunatic Asylums, Jails, and Work-houses.*

*Lunatic Asylums.*—Among the many instances continually presented to the medical practitioner of the uncontrollably potent sway of physical disease, and of the inability of all our best devised systems of medical treatment to check the ravages of its more destructive forms, it is refreshing to turn to the successful practice of those to whom the task of “ministering to minds diseased” is now entrusted; and to observe the almost uniform benefit that attends their efforts to improve the mental and bodily condition of the Insane—by carrying out that admirably wise and humane plan—the *System of Moral Restraint*.

The substitution of the present system for that which was formerly pursued in public and private Lunatic Asylums must be regarded as unquestionably the highest triumph of philanthropy and science combined, that has been achieved by the profession in modern times. How remarkable is the contrast afforded by the appearance of a dwelling for the Insane of the present day, to the spectacle which offered itself upon entering a mad-house conducted upon the old system of severity and forcible restraint! Twenty years ago, an asylum of this kind was, at the best, a mere prison, bare and gloomy, and with all the evidences of irresistible captivity fronting its unhappy inmates at every turn. Through the wards and courts of this house of sorrow were seen wandering pinioned, clogged, and hand-cuffed wretches, whose sullen and ferocious aspect shewed that nothing but the closeness of their restraint, or the fear of summary punishment, withheld them from acts of crafty malice, or frantic violence. There every keeper was a gaoler, and, as indicated by the cane or whip which he invariably carried in his hand, a castigator at his own discretion. Many of the cells were dens too miserable and



too squalid to be the receptacles of brute animals—to say nothing of human beings—containing wretches from whose bodies and minds alike the stamp of humanity might well nigh be considered to be obliterated for ever. The least painful or revolting objects that the scene displayed were probably those in whom the distempered mind, temporarily freed from the disturbance of external excitement, had sunk into a condition of torpid vacuity—the idiot twisting between his fingers straws which he had gathered from the floor, or the melancholy maniac crouching in the sunshine, gazing vacantly upon the shadows of the clouds as they passed. This, however, was by no means the most unfavourable view of the now exploded system; still, how different from the picture afforded to the visitor by a modern asylum, which usually presents the appearance of a clean, light, airy, and comfortable residence; the apartments of which are furnished with all that is absolutely necessary, and often with much that may be considered as ornamental, and even elegant, for the accommodation of the inmates. Here are open squares, and lawns, and covered ways, for exercise and amusement; usually workshops, perhaps a printing office\* and a garden,—often a farm,—for the employment of those who can be persuaded to adopt habits of salutary industry. Books lie ready for the studious; musical instruments are in many instances provided for all who delight in eliciting those harmonious sounds which, since the days of the poet-king of Israel, have ever been known to exert so strong a power in softening and tranquillizing the feelings of the Insane. The entire scene is, in short, usually one of activity and comfort—almost of happiness; and the consciousness that it is so, is infinitely enhanced by a knowledge of the fact, which is evidenced by a thousand minutiae in the arrangements and regulations of the place, that the entire study of the medical and other authorities is to secure, by

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\* Several of the larger British Asylums publish a periodical literary sheet. We have seen a few numbers of the *Morning-side Mirror*,—a small monthly paper, written and printed by the inmates of the Royal Edinburgh Asylum, which afforded most striking evidence of the value of those means which tend to restore the often highly-accomplished and elevated minds of the Insane to their pristine condition of healthy tranquillity. Cruel, indeed, must have been the system which would have condemned the writers of those clever and reflective articles to the coercion of the shackle and the whip, and which would have secured with manacles the busy hands which have given those fairly printed pages to the world, as evidence that the madman still retains within him all the elements of a thinking and an acting being.



every attainable means, the comfort, tranquillity, and restoration of the unfortunate beings who are entrusted to their care. We have omitted, in the above slight sketch, many of the most striking and characteristic features of each system; but, even as we have drawn them, the two pictures afford a view of the respective methods which cannot but lead every philanthropist to rejoice that it has pleased Divine Providence to awaken men to the atrocity and fallacy of the ancient plan, and to direct them to the adoption of a wiser and a more gentle course.

The subject which now most especially demands the attention of persons concerned in the management of these institutions, is the large mortality which still prevails among the inmates of Lunatic Asylums. It appears that, upon the whole, the condition of these unfortunates ought not to be one that should render them especially liable to the incursions of fatal disease. The state of seclusion in which they live, their freedom from a vast number of those injurious influences and vicissitudes to which the poorest of the labouring classes, and not a few of the middle ranks, are frequently exposed, the regularity of their diet, and the constant attention paid to their health, must certainly, in some measure, compensate for the ill effects which protracted conditions of mental excitement are known to produce upon the nervous and vascular systems; and even these injurious influences must be very considerably diminished by the system of management now generally adopted. Still, it is a well-proved fact that the rate of mortality among the inmates of Lunatic Asylums is still exceedingly high. In his excellent work on *Insanity*,\* Dr. Thurnam remarks that:—"The mean annual mortality of the Insane in English Public Asylums, exclusive of Bethlem and St. Luke's, so far as can be ascertained from their first establishment to the present time, has been 11·86 per cent.; viz. that of county asylums (for paupers only) 13·88 per cent.; that of county asylums, (receiving both private and pauper patients) 10·46 per cent. The mortality of seven Scotch Asylums has been 7·52 per cent., and that of the Irish District Asylums, during the comparatively short time they have been established, 8·7 per cent. Extended inquiry and consideration appear to justify our concluding that, taking considerable periods of time, during

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\* *Observations and Essays on the Statistics of Insanity: including an Inquiry into the Causes influencing the Results of Treatment in Establishments for the Insane, &c.* London, 1845.



which there have been no extraordinary disturbing circumstances in operation, in a mixed County Asylum, or in one for the middle and more opulent classes as well as paupers, a mortality which exceeds 9 or 10 per cent. is usually to be considered as decidedly unfavorable; and one which is less than 7 per cent. as highly favorable. In regard to Pauper Asylums, I believe we may conclude, under similar limitations, that a mortality which exceeds 12 or 13 per cent. is a very unfavorable one; and that one which is much less than 10 per cent. is highly favorable. Dr. Conolly has shewn that the annual mortality in the Hanwell Asylum from 1834 to 1844, inclusive, ranged from 6·40 to 11·99 per cent.

Even making due allowance for the gradual improvement which has probably taken place during the seven or eight years which have elapsed since these statistics were collected, under the continuance of the reformed system of managing the insane,\* it is evident that such rates of mortality as those given above demand the most sedulous attention, with a view to their reduction, especially when the exceedingly large number of lunatics (averaging from thirty to forty thousand) in the United Kingdom is borne in mind.†

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\* From the statistics of eight French, one American, two Scotch, one Irish, and four English, Asylums, given in the *London Medical Gazette*, for August, 1851, we find that during the year 1849, the total number of deaths in those institutions was 734 upon 2,171 admissions, or 30·42 per cent. The prevalence of Cholera in that year, however, may, in great measure, account for the generally excessive mortality. Dr. Webster, in alluding to this point, mentions that, in one French Asylum (Le Mans), the rates of deaths were only 6·20 per cent. This, he considers, may be regarded as the index of the ordinary rate, as no patient died of Cholera in that Asylum.

At the Pennsylvania Asylum, the proportion of deaths to treated was 12·35. No fatal cases of Cholera occurred in that Asylum during the year.

It appears, from the same article, that at St. Lukes, the annual per-centage of mortality during the last hundred years, has been, males 13·09; females 7·42;—total 9·71.

† A return, ordered on the motion of Lord Seymour, shews that the total number of Lunatics and Idiots (paupers) chargeable in *England and Wales*, on the 1st January, 1847, amounted to 18,065; viz., 10,429 Lunatics, and 7,636 Idiots. Of these unfortunate persons 5,142 were maintained in county lunatic asylums and hospitals; 3,761 in licensed houses; and 4,631 in union work-houses; while 4,418 were maintained by their friends or elsewhere. In that year there were 2,853 patients in the licensed lunatic asylums of the Metropolis. In the previous year, the total number of Lunatics chargeable to parishes in England and Wales, was given as 17,887.

At the commencement of 1850, the number under confinement was 15,079; of these 11,305 were paupers, and 3,774 private patients; exclusive of single patients in private custody, and of 264 criminals. In 1851 the total number was 16,456;—7,843 males and 8,613 females. In 1852, the number was stated at 12,059;—5,492 males and 6,567 females.

In a report recently published in the *Dublin Quarterly Journal of Medicine*, the total number of persons afflicted with Lunacy in Ireland was given



It appears to be a clearly-established fact that, even in the best regulated Asylums, the annual deaths are proportionally from twice to four times as numerous as among members of the community at large.\* This excessive mortality must be, in a great measure, attributable to conditions of disordered health which are the almost unavoidable attendants of several forms of Insanity. The liability of the Insane to organic disease, especially of the nervous and vascular systems, can admit of prevention only to a limited degree. Still, there is every reason to believe that Insanity is the cause, rather than the consequence, of most of those lesions in the vessels of the brain and of other organs which so generally exist in cases of mania; and it is evident that a course of management which substitutes gentle and tranquillizing control for painful and violent restraint, must directly tend to avert those diseased actions which frantic excitement or hopeless despondency may alike produce.

A highly interesting illustration of the value of Moral Treatment, as contrasted with the brutal system of neglect and coercion formerly employed, is given by Dr. Thurnam, in his *Statistics of the York Lunatic Asylum*, before and after its reform. During a period of thirty-seven years antecedent to 1844, the annual mortality in that institution varied from 9·5 to 14·8 per cent. and averaged, in the total number of years, 11 per cent. annually. In 1845 Dr. Thurnam reported that more than a quarter of a century had elapsed

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as 15,098; of whom not less than 8,985 were recorded as "Abroad, unprovided for in public institutions."

On the 1st January, 1851, the total number of pauper Lunatics in *Scotland* was 3,362. It was announced, a few years since, by the Minister of Commerce, that, taking the annual mean of seven years, from 1835 to 1841, the number of Insane Persons in *France* was 18,350. This number included all those who were and were not confined in public establishments. The admissions which amounted to 3,947 in 1835, reached 5,841 in 1841; and in the same period, the number of Insane, which was 14,586 in 1835, had increased to 19,738.

In 1849, Dr. Rubio, Chief Physician to the Queen of Spain, published the following statistics of Insanity:—

In *Scotland* the proportion of the Insane to the Sane is 1 in 417; *Canton of Geneva*, 1 in 446; *Norway*, 1 in 550; *Belgium*, 1 in 816; *England and Wales*, 1 in 700; [Dr. Winslow computes that, in 1844, there were 0·98 insane or idiotic in 1,000 of the male population of *England*, and 1·1 out of the female population.] *Prussia*, 1 in 1000; *Holland*, 1 in 1,230; *Spain*, 1 in 1,667; *France*, 1 in 1,733; *Ireland*, 1 in 2,125; *Italy*, 1 in 3,698; *Piedmont*, 1 in 5,818. Reference to other authorities, however, render it probable that these numbers require revision.

\* In the year 1844-45, no less than 15·50 per cent. of the patients died in a remarkably well-conducted pauper Asylum in *Ireland*; and this apart from any epidemic visitation.



since an entire change was wrought in the management of the Asylum, and in the treatment of the patients; and, during this time, the annual mortality had been reduced to 7·24 per cent.

Apart from affections of the nervous centres, there are a few diseases which continue to be extremely prevalent among the Insane:—the chief of these are *Diarrhœa* and *Phthisis*, and it is to the detection and removal of the causes which lead to the production of these maladies in Lunatic Asylums, as well as in other places of confinement, that the attention of the profession is especially demanded.

*Diarrhœa* is evidently by no means directly associated with the physical condition of the Insane, who suffer from it in common with the inmates of Jails, Work-houses, &c., in which the ventilation is imperfect and the diet bad. Dr. Thurnam justly designates the occurrence of this disease in any Asylum as “a very suspicious circumstance;” and it is certain that, in all instances where the annual mortality in any Asylum, Jail, or Union-House, at all exceeds the average, where Typhus, or any other contagious disease, *Phthisis*, *Dysentery*, or *Diarrhœa*, occurs among the inmates of one of these establishments, the matter should at once be made the subject of careful investigation and deliberation by the authorities, especially with reference to any thing which may admit of improvement in the cleansing, ventilation, lighting, drainage, heating, &c., of the building; or in the food, clothing, cleanliness, exercise, &c., of the patients. There are no valid grounds for regarding *Pulmonary Phthisis* as a disease to which the Insane are especially predisposed; it is perfectly evident that there are certain Asylums in which the proportions of deaths from this cause are annually greater than in any other Lunatic Hospitals whose reports are published. In these instances I have always been strongly inclined to believe that the greater liability to this disease is due to removable causes, such as sedentary employments, imperfect ventilation and lighting, and the absence of opportunities for healthy exercise in the open air, &c.

In the Report of the Royal Edinburgh Asylum for the year 1846, we find that, out of 19 fatal cases, tubercles were found in the lungs in 13. The leading features of the treatment adopted here are non-restraint and kindness, and various kinds of in-door and out-door amusement and exercise are provided for the inmates. Still, it was very observable that, during the year in question, a considerable number of the patients were employed under the tailor and shoe-



maker; that work to the value of £285 was accomplished within that period by patients engaged in the former occupation, while £147 were earned by those in the latter trade—the average number of patients being 410. Again, in a very creditable and valuable report of the Lancaster County Asylum for the years 1841 and 1845, we find that the deaths from Phthisis among the inmates were then very numerous. Between June 1840 and June 1841, 21 individuals died of this disease; the total number of deaths in the year being 70, out of an average of about 320 patients. Between June 1844 and June 1845, 25 patients died of Pulmonary Consumption, of whom 5 were males and 20 females:—the total mortality from all causes during this year, being 68. From the statement made in one of the tables appended to the Report, of the number of articles of clothing made by the female patients during the twelvemonth in question, it appears very probable that the great confinement necessarily attendant upon increased application to sedentary pursuits, in some measure, conduced to the augmentation of deaths from Phthisis.\* Among the males, on the contrary, (many of whom were engaged in out-door employments,) the deaths from this cause had diminished more than one-half. It is probable that the conductors of Lunatic Asylums, Unions, Penitentiaries and Houses of Industry, Schools, and, in fact, in all institutions where a large number of individuals are congregated together, and subjected to a certain degree of personal restraint, can scarcely fail to diminish the mortality from Phthisis and other chronic maladies among their inmates by a judicious adherence to the principles laid down by M. Fourcault.†

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\* Dr. Thurnam has shewn that, as a general rule, the relative difference in the rate of mortality in the sexes is enormously greater in the insane than among the population at large. Thus, at the York Lunatic Asylum, and at St. Luke's Hospital, the mortality amongst men has been nearly double that amongst women; there having been an excess on the side of the men of 93 per cent. in the latter institution. The excess of mortality on the side of males amounted to 72 per cent. at Hanwell; to 71 per cent amongst the "curable" patients at Bethlehem; to 63 per cent. in the Metropolitan Licensed Asylums for Paupers; to 57 per cent at Lancaster; to 46 per cent. at Woodbridge; to 34 per cent. at the Retreat, York; to 29 per cent. at Siegburg, near Bonn; to 13 per cent at Worcester, U. S; and to 9.9 per cent. at Schleswig Holstein.

† In the treatise already cited—*Causes Générales des Maladies Chroniques, Spécialement de la Phthisie Pulmonaire et Moyens de prévenir le Développement de ces affections*: Paris. 1844.

The report of the Commissioners of Lunacy for 1840 contained abundant evidence of the fact that much had still to be done towards the improvement of the moral and physical management of the Insane in



Dr. Thurnam has given some important statements which render it probable that the plan of diet adopted in Lunatic Asylums has an immediate influence upon the rates of mortality and of recovery among their inmates, and strongly suggest the necessity for strict enquiry into the equalization of the diet in different Asylums. Dr. Thurnam found that in those Asylums where a liberal diet was allowed, the recoveries averaged 43·7 per cent., and that the mean mortality was 9·35 per cent.; whilst, in four institutions in which the diet was less liberal and nutritious, the recoveries only averaged 36·75 per cent., and the mean mortality was as high as 14·54 per cent.

*Prisons.* The somewhat excessive revulsion of humane feeling which has, in recent times, induced the English Legislature to erect spacious palaces for the reception of felons, in place of the close and noisome dungeons into which it was the fate of the criminals of the last century to be thrust, and, literally, to "rot;" and the extreme care which has been taken to supply those institutions with ample and well-ordered dietaries, medical attendance, sanitary regulations, &c., upon a system at once more liberal and more solicitous than that which has characterised the organisation of the Union Work-houses for the Poor, have not availed in removing

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some of our English Asylums. While expressing their satisfaction in reporting that the various institutions for the Insane throughout the country are in an improved state, and that the management of those establishments is, for the most part, humane and judicious, the Commissioners state that, in several instances, they and the visiting justices "found it necessary to animadvert upon the excessive use of mechanical restraint; on the neglect of cleanliness; on inadequate ventilation; on want of sufficient attendants; on improper or deficient diet; on the dirty condition or scanty supply of bedding and clothing; on irregularities in the medical books; and on other defects. And in about *seventy* instances these defects were deemed of sufficient importance to require the special interference of this Board, by whose direction letters were addressed to the parties inculpated, the effect of which has been that the defects thus noticed have been wholly or partially remedied." The visitors made especial allusion to three houses in which they discovered that it had been the practice to garnish some of the patients' beds, during the day, with clean sheets, with a view to keeping up appearances, but to remove the linen at night! In one mad-house the system of neglect had been so egregious that the Commissioners recommended the withdrawal of the license. Allusion had been made, in the Report for 1848, to the defective condition of the wards appropriated for the reception of the Insane Females in Guy's Hospital. Special reference was at that time made to the want of baths; the offensive atmosphere in the rooms; the insecure state of the window-fastenings, and also to the fact that three female patients were found by the Commissioners, at the time of their visit, in a state of perfect nudity lying in the loose straw which constituted their bedding. In these, and in other respects, the condition of the Guy's Insane Ward had now undergone material improvement, but it was still considered to be defective, *owing to its situation*, in several important requirements.



those causes which almost necessarily render a state of long incarceration, in a marked degree, inimical to human life.

The importance of ascertaining upon what particular causes the excess of sickness and mortality among our Gaol Population depends, is shewn by the facts that, during the five years ending 1849, the average of commitments in the country was 27,282; while the annual average of sentences to imprisonment or transportation during the same period was 20,763.\*

About seven years since, Dr. Baly shewed† that, in the different English Prisons, the annual rate of mortality ranged from 15·767 to 38·938 per thousand; in the Prisons of the United States, from 19·019 to 39·336 per thousand; while in the Hulks of France, the rate of mortality varied from 30·7 to 53·4 per thousand; and that of the Houses of Correction from 30·5 to 86·9 per thousand.‡ It appeared further, from Dr. Baly's investigations, that the annual ratio of mortality in thirty-six of our largest County Jails and Houses of Correction was 19·013 in every 1,000 prisoners. In the Hulks of England, the mortality was remarkably large, being 38·938 per thousand. The excessive number of deaths was, however, accounted for, in great measure, by the fact that the more vigorous and healthy convicts were selected for transportation, and thus a large number of diseased and aged prisoners were congregated in those establishments. The annual rate of mortality in the Millbank Penitentiary was 18·147.§

\* *Edinburgh Review*; April, 1851.

† *On the Mortality in Prisons, and the Diseases most frequently fatal to Prisoners*. In the Transactions of the Royal Medical and Chirurgical Society, 1845.

‡ The annual ratio of deaths to every 1,000 persons living was then stated to be, in England (Metropolis), 15·390; France (the whole country), 14·140; Switzerland (Geneva), 16·165; United States (City and County of New York), 15·760.

§ In the year 1849-50, the deaths in this prison were no less than 8·2 per cent. We learn from the *Appendix to the Second Report of the Surveyor-General of Prisons* that, in Westminster Prison, during the year 1843-44, the proportion of deaths was no less than 24·93 per 1,000 (the highest rate of mortality in the table), while, within the same period at the Wakefield Prison, where the number of inmates was more than half as numerous, no deaths occurred. The other instances of the highest mortality occurred in the Cold-bath-Fields Prison, in 1840-41, when the proportion of deaths was 22·9 per thousand; in Wakefield Prison in 1840-41—23·7 per thousand; in Westminster, in 1842-43—21·0 per thousand; in Liverpool in the same year, 21·1 per thousand. In all the Gaols enumerated, the proportion of deaths is reported to have decreased of late years, shewing the effect of the introduction of improved systems.



Of late, the subject of mortality in prisons has been examined with great care by Dr. Forbes Winslow.\* This gentleman states that the known registered prison mortality is about 19 in 1,000 cases; a number of prisoners are, however, yearly discharged said to be labouring under "incurable diseases;" and calculating that one-third of these cases terminate fatally, the prison mortality will be at the rate of  $22\frac{4}{5}$  per 1,000. It is found that, at Springfield, the mortality is  $14\frac{3}{10}$  per 1,000; whilst, at Reading, it is estimated at 41 per 1,000 cases. The vital statistics of the English Prisons in 1850 have been calculated as follow, from the reports of the several establishments:—†

Pentonville, .. .. .	12·014	per 1,000.
Millbank,.. .. .	23·345	" "
Portland, .. .. .	10·85	" "
The Hulks,† (about) .. .. .	28	" "
County and Borough Prisons } in England and Wales, (about) }	16	" "

The diseases which are found to prove most fatal among the inmates of European Prisons are Phthisis and other maladies of strumous origin, Fevers, and Bowel Complaints.

Dr. Baly observes that one of the main results of his investigation of the health of the prisoners in the Millbank Penitentiary since the year 1840 was that, although, in particular instances, other causes may contribute to increase the number of deaths, yet, in all prisons, the Millbank Penitentiary included, the increased mortality was chiefly due to the prevalence of one and the same disease, namely *Tubercular Scrofula*. Dr. Baly brings facts and arguments to shew that the high rate of mortality suffered by prisoners in the Millbank Penitentiary cannot, except in small part, be ascribed to the previous unhealthiness of the criminal class. He considers it to be clearly proved by the medical records of the Penitentiary, that "the mortality caused by tubercular disease has been between three and four times as great during the eighteen years, 1825 to 1842, among the convicts confined in this prison, as it was in the year 1842 amongst persons of the same period of life in London generally, and that three-fourths of the excess of deaths from all causes in the

\* See *Abstract of a Paper on Prison Discipline* read before the London Medical Society, March 22, 1851: *Medical Gazette*, April, 1851.

† *London Medical Gazette*, November, 21, 1851.

‡ The data for the calculation of the mortality in the Hulks may be made to give three ratios—viz., 22, 49, and 69 per 1,000—assuredly a very suggestive fact!



Penitentiary, above the rate of mortality of all persons in the Metropolis, of the same period of life, has been due to the prevalence of this disease."\* Dr. Baly very justly argues that the fact of consumption and other forms of scrofula being less destructive to persons confined in the county gaols, &c. of England, than in the Penitentiary, by no means militates against the belief that tubercular cachexia is the disease which imprisonment has an especial tendency to produce. For the terms of imprisonment which persons undergo in the county prisons are, in a vast majority of cases, so short, that if the germs of tubercular phthisis were formed during the state of imprisonment, there would not be time for the disease to become fully developed, much less for it to reach its fatal termination before the prisoner's discharge.

Dr. Baly considers that the most influential of the causes on which the great mortality from tubercular diseases in prisons depends appear to be—1st, deficient ventilation; 2nd, cold; 3rd, want of active bodily exercise, and sedentary occupations; 4th, a listlessness, if not a dejected state of mind; and 5th, poorness of the diet. Amongst the prisoners in the Pentonville Prison, Phthisis has been considerably reduced by attention to those suspicious circumstances which are likely to excite the disease.† From the opening of the prison to the termination of 1844, the annual mortality per 100 from Phthisis had amounted to 11·14. [Dr. Winslow says that, of the first thousand admissions, 11 died of consumption, and 14 were discharged on that ground, which would be at the rate of  $2\frac{1}{2}$  per cent.] The physician, Dr. G. O. Rees, suspected that the *dusty trades* carried on in the cells, might have added to the chances of death from this disease. In 1845, measures were taken to guard against the supposed

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\* The annual mortality from Consumption, Hæmoptysis, and other tubercular diseases, in the Millbank Penitentiary, was, when Dr. Baly wrote, 16·113 in 1,000. English County Prisons 4,772. Inhabitants of London, between the ages of 15 and 70, 4·407. Eastern Penitentiary, Pennsylvania, (white convicts,) 12·864. Auburn State Prison 9·892. According to Dr. Winslow the comparative rates of mortality are as follow :—

Metropolis ..	{	Consumption, $4\frac{3}{10}$ per 1,000.	
		Scrofulous Dis-	
		cases, .. $\frac{3}{100}$	"
In Prisons ..	{	Consumption, $13\frac{1}{4}$	"
		Scrofulous Dis-	
		cases, .. $2\frac{8}{10}$	"

† *Medical Gazette*, February, 1848.



causes : in 1846 only 4 cases per 1,000 of consumption occurred, and in 1847, up to the 20th October, there was not a single death from this disease.

The causes of fevers are now so well understood that whenever *Typhus*, or any other contagious malady, makes its appearance in a prison, its source may almost invariably be detected at the very outset. It will usually be found to depend upon the operation of one or more of the following influences :—over-crowding ; defective drainage, or the vicinity of other sources of miasmata ; uncleanness, either in the house or in the persons of the prisoners ; defective ventilation ; the supply of impure water ; faulty systems of heating the wards ; or the culpably needless introduction of contagion from without.

The above-cited authority is of opinion that, although several facts strongly favor the generally received idea that the prevalence of *Bowel Complaints* in many gaols is caused by the liquid nature of the diet, it is altogether incorrect to regard the diet as the sole cause of the prevalence of diarrhœa in prisons, and he brings facts to shew that the disease usually depends upon some form of malaria floating in the atmosphere. There may be a good deal of truth in this argument,—still, it is difficult to resist the conviction that it is upon the nature of the diet, or certain other internal arrangements peculiar to prisons and union-houses that the frequency of diarrhœa in those establishments depends. It appears that diarrhœa never prevails to an equal extent among the inmates of colleges, schools, and other establishments where the inmates enjoy the advantage of good air, and free exercise ; or among the inhabitants of towns and villages adjacent to the prisons where, *cæteris paribus*, the effects of malaria may be expected to be equally potent. There appear to be strong grounds for believing that the disease in question is, in reality, due to the effects of particular states of the atmosphere, generally or locally diffused, upon persons rendered susceptible by a restricted or faulty diet, and by confinement.—Indeed, this appears to be, in substance, the conclusion at which Dr. Baly himself ultimately arrives.

The questions how far it is the duty of society to guard criminals from those causes of death under which thousands of their unoffending brethren are continually falling victims ?—and with what degree of justice the violators of the laws of God and of society can be better fed, more sumptuously lodged, and more warmly clothed, than those who have



fallen into the depths of poverty—but no further?—must rest with our legislators,—they require no solution here. As advocates for the conservancy of the public health, our course plainly is to regard the inmates of prisons merely in the light of individuals threatened by various causes of excessive mortality; and, therefore, to strive diligently to obviate the development, and check the operation, of those injurious influences by every means that we can command.

Adherence to the ordinary rules of the sanitary system which has been already laid down will, of course, go far towards preserving the health of prisoners. Still, in the Hygienic arrangement of Jails, the injurious effects likely to arise from improper food, over-crowding, and long confinement, must be especially borne in mind.

The superficial enquirer is liable to fall into almost hopeless perplexity with regard to the dietary systems of our English Jails; on one hand, he will find it noticed that “the diet of prisons, though often perhaps more abundant than the agricultural labourer usually enjoys, yet has generally been less stimulating, and also less nutritious, than seems to be requisite for the health, under conditions so unnatural and depressing as are those almost necessarily attendant on the state of imprisonment.”\* On the other, he will see it remarked that “the sustenance provided for the inmates of Newgate is infinitely better than that which most agricultural labourers in England, or *any* husbandman in Scotland, is able to obtain by the sweat of his brow;”† and that “by the conditions attached to the contracts for supplying provisions, &c., for the use of the convicts on board the hulks at Portsmouth, the provisions are required to be of a much superior character to those which two-thirds of the population of the neighbouring towns are able to procure—they are, indeed, required to be of the very best qualities it is possible for even a tradesman or a man of affluence to procure for himself. The beef must be good ox or heifer, sound, sweet, and fresh (bull, cow, or stag, will not be received), in fore and hind quarters alternately.”‡ A very slight practical insight into the ordinary working of the contract system will, however, be sufficient to show that, although the conditions of each contract may demand almost absolute perfection in the articles furnished, the individuals supplied

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\* Dr. Baly.

† “An hour in Newgate”—*Chambers' Edin. Jour.* July, 1845.

‡ Idem, Oct. 1850 :—from the *Hampshire Independent*.



under these contracts may be ill and insufficiently dieted. The revelations lately made by the Analytical Sanitary Commission, in the *Lancet*, with regard to the adulteration of oatmeal, arrow-root, and many other articles of food supplied on contract to English Prisons, Work-houses, and Charitable Institutions, are of great importance, and deserve the closest investigation.\*

The dangers arising from the over-crowding of human beings are especially liable to be fatally illustrated in our prisons. With regard to the ordinary frequency of zymotic disease among prisoners, Dr. Baly remarks that "the average annual mortality by all the diseases which can be ascribed

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\* It was found that 16 out of 30 samples of oatmeal submitted to examination were adulterated with *barley-meal*, the price of the former being, at that time, 16s. per cwt. and that of the latter 8s. per cwt. [*Lancet*, July 12th, 1851.] This discovery led to some observations regarding the danger of adulterating oatmeal supplied to Work-houses, Prisons, &c., with barley-meal, and upon the probable effects of this fraudulent practice in producing diarrhoea and other bowel-complaints; Dr. Pariera's authority being quoted to the effect that barley-meal contains less protein matter—in other words, less of flesh and blood-making principle than wheat-meal—and that it is more laxative than wheat-meal. These remarks led to the appearance of the following statement, (July 12th) which deserves to be quoted for the light which it throws upon the principles of the contract system—The writer says—"since your able analyses have taken place, it has struck me that I may be able to give you a little information as to an article of food which is adulterated to an *awful* extent—viz., *Oatmeal*. I will first mention *Oatmeal as sent into work-houses, prisons, and charitable institutions*, which are generally taken at contract prices. I enclose one for the parish of — for 1848, where I find the oatmeal was taken at 14s. per cwt. by —; and by reference to the stock-book, I find the market price was 17s. 6d. per cwt.; thus the oatmeal was reduced 3s. 6d., and then left an excellent profit. Well, at that time I was trying for all the contracts in London, and could not succeed, my *prices* being generally about 4s. dearer than any one's else: this was a *mystery* to me. By accident, I found out oatmeal was adulterated with barley-flour, which is bought at about 7s. per cwt.; this being mixed with the oatmeal, of course reduced the *prices*. I then being as wise as my competitors, tried, and have served the above work-house since.—Now the fault lies here. If the work-houses were to take the contracts at a per-centage on market-value then they would get *good* oatmeal; but they always *cut down* the price, and thus get an adulterated article. You will see the prices are 14s., 15s., 16s. and 17s.; thus if a man wants to be *honest* with them, *they will not let him*. I have again and again wished to supply on a per-centage on market-value; the answer I get is, '*Well, we are very well satisfied, and have no complaints.*'" The conductors of the Analytical Sanitary Commission add that they have been at some pains to verify the above statements; and, for that reason have procured samples of oatmeal as supplied to some of our unions and charitable institutions, and which, without exception, they have found on examination to be largely adulterated with *barley-meal* as described. They also allude to the fact that, at the inquest held on the bodies of some of the poor children who fell victims in the "pest-house" at Tooting, the fact transpired that the oatmeal, which formed so considerable a portion of their food, was largely adulterated with barley-meal.



to the influence of malaria, has been 4.511 per thousand prisoners in the County Gaols and Houses of Correction, and 5.632 per thousand in the Millbank Penitentiary. This excess of mortality, on the side of the Penitentiary, has been almost entirely due to fever. The proportion of deaths caused by bowel-complaints has been scarcely at all greater in that institution than in the country prisons."

There is little of real practical moment to be gleaned from the records of mortality in English Prisons, previous to the well-known enquiry instituted by the Parliamentary Committee in 1727, with reference to the atrocities practised by Bambridge the Warden of the Fleet; or between that time and the first operation of Howard's suggestions:—it is enough to say that the heaping together of guilt and filth, disease, madness, and despair, in those loathsome and utterly neglected dens, not only caused pestilence to be almost constantly rife within their walls, but gave rise to outbursts of poisonous emanations which—like the flame of the Babylonians' seven-fold heated furnace—from time to time issued through their gratings and destroyed the ministers of the law while in the every act of sentencing men to barbarous and irrationally-devised punishments. We can feel no surprise in learning that, about fifty years since, Newgate was ravaged by a contagious fever, when we find that no less than eight hundred prisoners were crowded within its narrow precincts; and when we are told by Sir Richard Phillips that, in 1808, the jail usually contained from a hundred to a hundred and fifty female prisoners, to each of whom *eighteen inches* breadth of sleeping room was allotted! Now, the Commissioners of Prisons allow a thousand cubic feet of air to each prisoner in his sleeping place.

In 1847, the *Union Médicale* reported that, among 1,968 prisoners at Clairvaux, there were, on the 24th of May, no less than 363 sick, and 165 convalescent. There were 60 deaths in April and 57 in May; making 117 deaths in less than sixty days; nearly *two* per diem! In thirty-two months there were 500 deaths among 2,000 prisoners; of 410 female prisoners, 119 were on the sick list. This excessive sickness and mortality appear to have arisen from over-crowding, as it was stated that the inhabitants of the town and garrison were at the same time in good health.

The *Solitary System* has, apparently with great justice, been considered an efficient means of checking the development of fever in prisons. In 1847, the *Gazette Médicale* reported that, at a conference held at Frankfort, it was stated



that those prisons which were provided with separate cells were comparatively free from typhus fever, while it was spreading its ravages through others where the prisoners were in common. In the former the mortality was only 3 per cent., while in the latter it was 10 per cent.

On that occasion it was mentioned that during ten years' trial of the solitary system at Warsaw, there were only two cases of *Insanity* among the prisoners. This, however, is a very important question which requires the closest sifting. Eleven years ago, the Superintending Committee of the Millbank Penitentiary reported that, "in consequence of a distressing increase in the number of insane prisoners, the separate system has been relaxed." In a subsequent Report, the Committee stated that, eighteen months before the alteration of discipline took place, 15 prisoners became insane; in the eighteen subsequent months only 5. Dr. Winslow has recently placed this question in a very striking point of view. He shews that 2.46 (say  $2\frac{1}{2}$ ) of adult working Englishmen in 1,000, are insane or idiots:—while the cases of mental disorder in the Pentonville Prison, between January 1st, 1843, and June 30th, 1850, were 42 out of 3,050 prisoners, being 13.7 per 1,000. At which rate (were it general) we should have in 1851 near upon 50,000 male pauper lunatics in England alone! It is added that Pentonville excludes idiots and men known to have been insane; those confined there being picked men in the prime of life—20 to 40 years of age.\* Further, in Portland Prison the number of cases of insanity has been 5 in 1,450 prisoners, or 3.46 (say  $3\frac{1}{2}$ ) per 1,000, being 1 per 1,000 above the average. In Millbank—34 cases in 18,520 adults, or 1.8 ( $1\frac{4}{5}$ ) per 1,000;—29 in 2,024 juveniles, or 4.4 ( $4\frac{2}{5}$ ) per 1,000. Among the troops on home service, the cases of insanity are stated by Dr. Balfour to be 0.73 ( $\frac{3}{4}$ ) per 1,000 men.

The question regarding the effects of the solitary system of confinement upon the mental and bodily health of those subjected to it has, of late, been very strongly and obstinately contested. On the one hand, we are told that it is a matter of demonstration "that separate imprisonment is perfectly compatible with good health, and that it is even attended with an immunity from disease not to be found in many honest callings."† On the other hand, we have

\* The rule at Pentonville was—from 18 to 35 years.

† Leading article, *Medical Gazette*, November 22nd, 1850.



a large body of opinions and facts adverse to the separate and silent system, in addition to the very striking facts adduced by Dr. Winslow, and already cited, and to his opinion that—"although the separate system is better than any other plan that has been suggested and adopted, it requires most careful and vigilant watching, and calls for some modification tending to obviate the mischief both to the mind and body which it undoubtedly gives rise to."\* Let any dispassionate investigator carefully peruse the evidence of Dr. G. O. Rees, published in the Parliamentary Report of the Select Committee on Prison Discipline (1850), and he will glean from it that, although this very high authority speaks with a strong conviction of the efficacy of the "experiment" as tried at the Model Prison under his own supervision—that experiment is, by his own shewing, one of the most highly dangerous character. Thus, Dr. Rees thinks that eighteen months, under the separate system, "is a period that might be adopted in general without much injury to the prisoners."—He observes "that the cases of insanity or delusion, which have occurred, have generally occurred at early periods of separate confinement, and not at advanced periods"—Again—"men have suffered from fits since the period was shortened;" and, still again, Dr. Rees remarks that since the period has been thus shortened—in addition to four attempts at suicide during the year 1849—"there is an irritability observable, which he has never before noticed among men confined in Pentonville." What do we gather from this testimony, but the belief that—although a very considerable proportion of men *can* endure eighteen months of silence and seclusion, and that although when fully inured to this discipline, their minds and their constitutions are tolerably safe, a certain number fail suddenly, mentally and physically, during the earlier months of this severe ordeal; and that, when a prisoner has been subjected to the discipline for a few months only, the irritability of his mind is such that it is infinitely safer to Keep him where he is,—until he has become fully seasoned:—should he now suddenly leave his solitary cell, the contact with the ordinary excitements of every-day life will jar so insufferably upon his over-strained nervous system that he will be in imminent peril of lunacy and self-destruction. Mr. Hampton, the surgeon of a convict ship in which a considerable number of the Pentonville prisoners were transported, states that "the

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\* Vide *ut supra*.



sudden change from great seclusion to the bustle of a crowded convict ship produced a number of cases of convulsions, attended, in some cases, with nausea and vomiting; in others simulating hysteria; and in all being of a most anomalous character." Mr. Hampton elsewhere states that these hysterical convulsions were propagated among the men by imitation. They entirely ceased on the third day after leaving England. It is shewn that these fits occurred chiefly among prisoners who had undergone the *short* period of confinement. The prisoners who had been in confinement for some eighteen to twenty-three months under the most rigid separate discipline were not attacked in this manner. In the course of this enquiry, Mr. Bradley, surgeon of Pentonville Prison, stated it, as his opinion, that towards the end of the twelvemonth the bodily health of the prisoners begins to be affected; they become pale, and he thinks that the seeds of consumption are in many cases developed. He did not know that the separate system itself produces consumption during the first twelvemonth; but he believed that the cases of consumption between the twelfth and eighteenth months are double the number of those that occur during either of the preceding six months. During the last seven years, there had been many cases of mental disease; the greater number of which had occurred during the first six months. He found that "there are two periods at which the pressure seems to be greatest: the first period is from six weeks to two months after admission, and the latter period is towards the end of the first twelvemonth." Mr. Bradley considers that twelve months is the maximum time which can be recommended for the infliction of the separate system, looking to the health of both body and mind. Upon the whole, he appears to consider that, supposing the separate system to be strictly limited in time, and carefully guarded by watching the health of the individual inmates of the gaol, this system tends rather to improve than to injure their health; but that if not carefully guarded, or carried too far, it is full of danger. The Revd. J. F. Burt, assistant chaplain to the Jail, shews that, during three and half years of short imprisonments, (terms not exceeding twelve months) the daily average number in gaol was about 440, and that there occurred 14 cases of Insanity, 11 of Delusion, 3 of Suicide;—total 28. During four years of long imprisonments (for terms exceeding twelve months, to any average of seventeen or eighteen months; some of the prisoners remaining as long as twenty-three months) the daily average number of con-



victs being 445, the cases of Insanity were 3, Delusions 8, Suicides none;—total 11. Within the whole of that period then, the cases of Insanity were 17; of these 15 occurred before the twelfth month, and 2 after. Delusions 19; of these 15 occurred before the twelfth month, and 4 after. In consequence of the unfavorable character of the above facts, an alteration in the system of this gaol was made in 1849-50, the term of imprisonment was shortened to an average period of eleven months. A considerable number of convicts were placed in association; the systems of moral and educational training and of direct medical supervision were, in great measure, abandoned; and, at the same time, a certain proportion of old men and boys were sent to this prison. It appears, however, that, as might fairly have been anticipated, the results of these partial changes have not been favorable; 9 cases of Insanity and 13 of Delusion occurred during the two years. The following were among the records of 1850—Deaths, 6; Suicide 1; Removals on medical grounds (including the 12 cases of mental Delusion),—40; Unfit for penal labour at the termination of their imprisonment, 25; Mania, 6 [5?]; Mental Delusions, 12! Assuredly, there is nothing satisfactory or encouraging in these results of the separate system upon the mental and physical constitutions of a class of prisoners, averaging daily about 450—all of whom were originally selected from the multitudes of criminals who crowd the London Gaols, as healthy specimens well calculated to endure this experiment of mental and bodily racking. Without diverging from the track of the present investigation to enquire whether this or any other kind of punishment exceeds or falls below the wise designs of a Government in the moderation of crime, we must at once perceive that a main element in the infliction of punishment is a just appreciation of the precise nature and effects of the corrective means employed. It may or may not be proper to compel our felons to undergo a system which places them in imminent danger of madness, or of chronic disease; but we fall into an error little short of fatuity, if, in maintaining this system, we persuade ourselves, and endeavour to convince them, that we are all the while succeeding in making them stronger and wiser than they were before they were subjected to our grave experiment.

In reviewing the comparative rates of mortality in our several prison establishments, it appears very evident by what general causes the different degrees of health among the



inmates of each are determined ;—always recollecting that the “criminal class,” previous to their committal to prison, probably contain more individuals of faulty constitution than does any other class of adults in the country.

Thus we have seen that the mortality at Millbank ranges from 18 per thousand to upwards of 8 per cent.—there is nothing surprising in this, when we recollect that the “Penitentiary,” although erected at an outlay exceeding half a million sterling, stands—immediately behind and below the muddy bank of a wide river—in the centre of a peat moss,—suggesting, at first sight, the idea of Giant Despair’s Castle planted in the midst of the Slough of Despond. Two years after its establishment, this prison was visited by so deadly an epidemic (or endemic) that a special Act of Parliament was issued directing that it should be abandoned for a time, the whole of the prisoners being removed to the Hulks.\* Again, the convicts in the Hulks, whose annual mortality ranges from 22 to 69 per 1,000, are, very properly, employed, chiefly by the water side, in works of local and national utility,—such as extensive drainage operations, the excavation and clearing of docks, &c., which, from the trying and dangerous character of the labour required, can scarcely be fairly committed to free labourers. On the other hand, the convicts at Portland represent the very highest degree of health in our prison population. They are all picked men, in the prime of life, who have passed through the ordeal of the trying systems at Millbank and Pentonville without sustaining mental or physical impairment :—they are kept in a healthy locality, employed in severe but fair labour in constructing a break-water ; they work in association, but are separated at night ; and several encouragements are offered to the industrious and well-conducted. Here, as might be anticipated, the annual mortality is low, falling somewhat short of 11 in a thousand.

One of the principal results of Dr. Baly’s enquiry was, that imprisonment, continued for periods of 2, 3, or 4 years, produced everywhere a high rate of mortality. “The rate of mortality amongst the prisoners in the Millbank Penitentiary appears to have been 13·052 per thousand during the *first* year of punishment ; 35·645, during the *second* year ; 52·267, during the *third* year ; 57·131, during the *fourth* year ; and 44·170, during the *fifth* year ; the rate of mortality rising rapidly from the first to the third year and slowly

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\* *Knight’s London.*



in the fourth, but falling again in the fifth year." In short, "the mortality suffered by convicts during the first year of their imprisonment has been comparatively slight; it has been more than doubled during the second year, and has continued to encrease to the end of the third year."

These are grave facts, tending strongly to the inference that, when the Law decides that a culprit shall be secluded from the world for a crime which does not call for the forfeiture of his life, it would be better to decide upon his immediate removal to one of the penal colonies, or elsewhere, for a lengthened term of years, rather than that he should be confined for a shorter period—but at an enormous cost to the nation—in a palatial gaol, where he is constantly menaced with a fourfold probability of death.

*Work-houses.*—With our present data, it would be difficult to arrive at any satisfactory practical result regarding the mortality which prevails among that half million\* of friendless wretches who take refuge in the Poor-houses of the United Kingdom. It is certain that in a very large proportion of these houses the mortality is excessive;† still, as

\* The number of in-door paupers in England and Wales during the sixth week of the quarter ending Lady Day, 1851, was 116,744; on the 22nd June 1850, there were 264,048 in-door paupers in Ireland; and in 1849, the registered paupers of Scotland amounted to 82,357.

† This is especially the case in some of the Irish Unions. The following extraordinary table of deaths among the inmates of Kilrush work-house appeared in the *Illustrated London News* of Dec. 29th, 1849:—

Year	Average number of Inmates.	Total Deaths.	After a residence of more than				
			Three months.	Two months.	One month.	One week.	Odd days.
1847	922	1075	321	235	264	154	101
1848	1411	1209	372	298	326	152	61
1849*	1617	441	138	90	84	76	53

\* Exclusive of December.

Still, again in March, 1851, Rev. S. Godolphin Osborne stated, in the *Times*, that the accommodation for paupers, in the Kilrush Union-houses was, in the three weeks ending the 8th, 15th, and 22nd, of that month, calculated for 4,654; in the week ending the 8th March there were 5,005 inmates, and 56 deaths!—in the week ending the 22nd March, 4,868 inmates, 79 deaths! That is, 203 deaths in 21 days. Previous to this, it had been reported by the medical officer that the inmates were over-crowded and improperly fed. A published statement of the half year ending September 29th, 1850, is also cited, to the effect that 1,014 deaths occurred among the Kilrush In-door paupers during that half-year. The average weekly outlay per head being—food, 11½d. clothing, 2d.

In April 1851, Mr. Monsell drew the attention of the House of Commons to the mortality in the Kilrush and Jennistymon Unions, in the latter of



nearly all of them give refuge to considerable numbers of infants,\* of persons worn out by age or by premature decay, of individuals who enter almost in the last stage of want and exhaustion, and of those who are rejected at the hospitals as incurable, any fair comparison can scarcely be drawn between the mortality which occurs among their inmates and that which prevails in other classes of the community.

XIX. *The Adoption of Measures encouraging the Poor to bring their Children to be Vaccinated.*

In their continual observation of the saving efficacy of Jenner's inestimable discovery, the profession appear virtually to overlook the striking incompleteness of the Vaccination System in England, and to be insensible to the strong prejudices which still prevent its extension among large classes of the people. Many will be unprepared to learn that, in the very heart of our boasted civilization, the most energetic superstitious feeling exists against this salutary measure. Evidences of this fact are of frequent occurrence even in the most recent reports on vaccination. Thus, in 1850, the Registrar for Nottingham stated that a woman in his district, who had lost a child by disease, assured him that she would rather lose half a dozen children by it, than *fly in the face of Providence in having one vaccinated*. In 1851, the Registrar of St. Ives gives a parrallel illustration of the prevalence of a similar kind of fatalism in his district. He says, "People have a superstitious fear of having their children vaccinated. They say 'it is taking the cause out of the hands of God.'"<sup>†</sup>

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which, in two weeks, there had been 253 deaths out of 3,893 persons—a proportion unexampled, he said, in the history of charitable institutions in this country. Recently, returns of the mortality in the Irish poor-houses have been completed. With reference to these papers, the Rev. Mr. Osborne says,—“such documents should not be put aside as ‘mere blue-book literature.’ Let any intelligent foreigner read them, and what can he think of our justice, our humanity?” In such cases, unhappily, it is easier to blazon the evil than to demonstrate its remedy. It is certain that, here, agitation is as inappropriate as brandy is in ardent fever. So far as our present question is concerned, the above records of calamity tend rather to illustrate the state of the country than to display any noticeable features in the management of the Irish work-houses.

\* The number of destitute children supported by the Poor-Laws in England and Wales averages about 300,000.

† *Return of the Registrar-General for the June Quarter, 1851.* Prejudices scarcely less rational than these often exist with regard to vaccination in the minds of otherwise highly intelligent persons. That is to say, nearly as often



The generality of readers are aware of the fearful destruction of life from Small-pox which prevailed antecedent to the introduction of variolous inoculation. The researches of Casper tend to shew that this scourge formerly swept away one-tenth portion of the human race. It is stated that, previous to the introduction of vaccination in 1800, sixteen per cent. of those who died in London fell victims to this pest. "Duvillard has found—1st, that in the natural state of 100 individuals of 30 years of age, scarcely four individuals have escaped an attack of small-pox; 2nd, that two-thirds of all infants are attacked by it sooner or later; 3rd, that small-pox in the early years after birth destroys, on an average, one out of every three who are affected with it; 4th, one dies of every seven or eight affected, at whatever age it may be."\*

Upon the general introduction of vaccination, its specific prophylactic power was almost immediately displayed and recognised. A Parliamentary Report published in 1833 describes the mortality as falling to 3 in every 100. Previous to 1800, about 1 in 4 of those attacked with small-pox died. In the Small-pox Hospital the deaths amounted to about one-third; and, in certain epidemics, from 15 to 42 per cent. of those attacked perished. Latterly (in the epidemic of 1838), the deaths were as 1 in 2.52 among the unprotected, while only 1 in 9.61 of those protected fell victims to the attack.†

It would be supposed that the general diffusion of such facts as these among a reading people (they may be met with in the reading room of every mechanic's institute in the United Kingdom) would have led to an almost universal adoption of this great and absolutely safe preventive. Still it will be found that, although for eleven years past the gratis

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as a child falls into a condition of disease—becomes strumous or suffers from enlargement of the mesenteric glands for example, within a year or two after its vaccination, the unfortunate medical attendant of the family is made the subject of bitter execration—"for vaccinating the child with diseased matter" and thus "poisoning its blood." It is true that there are one or two diseases which may be conveyed from one system to another in this manner, but medical men are usually so extremely cautious in this respect, that I have never met with a single well-authenticated instance or record of such an occurrence. In these cases generally the fear and the suspicion are as irrational and fanciful as would be the notion that the perversion to Mahomedanism of the eccentric Edward Montague was the natural result of Lady Mary's sensible experiment in having him inoculated from a little Turk in Constantinople some fifty years before.

\* *Chambers' Information.*

† Hooper.



vaccination of the poor has been proffered by legislative enactment, scarcely more than two-thirds of the entire number of children born in the country are permitted to enjoy the security which it offers.\* The Reports of the Poor-Law Commissioners afford us the following data :—

		<i>Unions and Parishes.</i>		<i>Children Born.</i>		<i>Vaccinated.</i>		<i>Unsuccessful.</i>
1844	..	542	..	412,891	..	290,453	..	12,261
1845	..	580	..	486,632	..	362,087	..	14,322
1847	..	621	..	—	..	267,895	..	20,133
1848	..	626	..	—	..	389,367	..	15,135

We find, then, that, notwithstanding the large and rapid increase of population, which is known to have taken place within the intermediate period, the vaccinations in 1847 were 22,558, (or, making allowance for an excess of unsuccessful cases,—30,420,) fewer than they were in 1844! In 1848, an improvement is visible; still, when we consider that the births in that year were about five hundred thousand, the numbers given do not appear to represent that extension of vaccination which the public health demands. Indeed, we learn from a report to the Poor-Law Commissioners, that, taking 627 unions and parishes in England and Wales in the year ending September, 1848, the number of persons under one year who were vaccinated, exclusive of those vaccinated at the cost of their parents, amounted to no more than 33 per cent. of the total births registered in the same period.†

The annual reports of the National Vaccine Establishment must be expected to afford some distinct information regarding the progress of vaccination in England: as, although the number of charges of lymph sent out may not give any direct clue to the number of persons vaccinated, it is evident that, with an increase in the practice, a proportionate increase in the number of demands for lymph would result. This, however, has not been the case. In the year 1844-45, 175,362 charges of lymph were supplied by the Board; in 1845-46, the supply had fallen to 158,531 charges, “of which” says the report,‡ “independent of an increasing home consumption,” [?] “a large proportion has been distributed to an-

\* Dr. Stark.

† There appears, however, to be a discrepancy here, which requires to be re-investigated.

‡ Printed 16th June, 1846.



swer the constantly recurring demands of the army, navy, colonial and emigration offices, and various stations in Her Majesty's possessions in every part of the world." In 1848-49, 174,991 charges were distributed. In 1849-50, the distribution still only amounted to 172,944 charges. In the report for this year, regret is very justly expressed that vaccination is not more universally resorted to, as with this neglect the frightful amount of small-pox still existing in the United Kingdom is inevitably connected. In the Metropolis alone, the total mortality from this pestilence amounted in eight years to 7,039, and was mainly dependent, as the Commissioners believe, upon the neglect of vaccination: in support of which opinion they quote their report for 1817, where it is stated that, from the year of its foundation, (1809) 34,369 persons had been vaccinated within the bills of mortality of whom only 5 had the small-pox.

According to the sixth Report of the Registrar-General, the total deaths from small-pox in England and Wales were 16,268 in 1838; 9,131 in 1839; 10,434 in 1840; 6,368 in 1841; and 2,715 in 1842—thus ranging from 1,101 to 172 in every million of the inhabitants.\* This Report shews that, at about the same period, our continental neighbours were much more fortunate or provident in this respect. The deaths in France from small-pox were 3,317 in 1842, or not more than 91 to every million of the population.† The deaths in Austria from small-pox, were 4,619 in 1840, 5,189, in 1841; and 4,411, in 1842, out of a population of 21,571,594. It is evident that the means of diminishing the severity of variola throughout the United Kingdom, by increasing the sphere of vaccination, demand immediate and sedulous attention. In the Vaccine Report for 1850, already cited, attention is drawn to the absence of efficient measures of medical police calculated to check the progress of this fatal disease; or, if possible, to extinguish it altogether;‡ and especial notice is called to the fact "that the contagion, in a

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\* In 1844, the deaths from small-pox in London were 1,804; in 1845, they fell to 909.

† The French Vaccination Reports for 1844 give 582,000 vaccinations to 924,000 births. During that year, 1,175 died of small-pox out of 8,812 attacked.

‡ According to Dr. Watson, variola had, at one time, disappeared in Denmark under a system of compulsory vaccination. In 1846, it was mentioned, in the *Gazette Médicale*, that vaccination is extensively practised in Turkey. At each stage of his journeys, the Sultan causes the children of all classes, Turks and Christians, to be brought to him, and he has them vaccinated in his presence. In order to enhance the value of the operation, and render it popular, he bestows money on all the poorer parents.



vast majority of instances, is carried throughout this country by the wandering Irish, it being feared that no care, however great, can be successful in eradicating small-pox, whilst the neglect of vaccination and the practice of variolous inoculation are permitted in Ireland."\* The report further draws attention to the more rapid progress of vaccination in foreign countries, owing to the municipal measures or legislative enactments there adopted to promote its dissemination, urging that, unless a similar course be followed in England, the country can never hope to be freed from its frightful scourge.†

It is, of course, impossible not to view with painful regret that item in the mass of fatal ignorance bearing down the intellects of the uneducated classes, which renders the name of vaccination a cause of superstitious terror in the hearts of thousands. Every surgeon in his daily rounds, every country gentleman in his intercourse with his tenants, every clergyman in his public advocacy of religion and truth, should energetically combat and argue away this false and dangerous prejudice;—still, education is a slow cure for daily encroaching public evils. Every scintilla of light takes years on years to travel into the dim recesses of the vulgar intellect, and here the evil requires an almost immediate check. The remedy appears to lie at present at the disposal of the medical profession. It is an indisputable law in human affairs that the labourer is worthy of his hire; it is a truth equally indisputable that few classes of labourers are proportionately worse paid than the medical officers of Unions under the existing Poor-Law System. Neither is it very questionable that the sum at present raised under Legislative authority for the support of the Poor in England and Wales might be expected to admit of the disbursement of more than one thirty-fourth of its amount for medical attendance.‡

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\* During the first half-year of 1845, the amount expended in vaccination in 108 Irish unions was £1,553, 3s. 11d.; during the second half-year, £1,813, 8s. 2d. were laid out in 112 unions. In that year £25,905, were expended upon vaccination in 580 registered Unions of England and Wales. That is to say, comparing the populations of the two countries, that the relative annual expenditure in England and Ireland was as nearly three and half to one.

† *London Medical Gazette.*

‡ In 1849, it was held at a meeting of Poor-Law Medical Officers, at which Lord Ashley presided, that £8,000,000 was annually raised for the support of the population of England and Wales; and that, out of this sum, £170,000



Still, in the absence of adequate provisions for the vaccination of the Poor, it may be hoped that the Medical Profession at large will generously afford their aid in rendering this safeguard general throughout the kingdom. In 1847 the number of public vaccinators in England and Wales was 2,855; in 1848 it was 3,154. The number of medical men in the two countries now considerably exceeds 15,000, and the benefit which would arise from the active co-operation of even one-half of that number in the gratuitous practice of vaccination among the illiterate poor, would fully reward the benevolence of the act. Among the many degradations which ages of hard competition and of ill-requited toil have accumulated upon our class, we are still able to declare that corporeal suffering never yet implored the benefits of medical skill and was driven away unrelieved on the score of inability to fee the hand that ministered to it. In the present exigency, it is probable that the aid of the clergy, and of many other humane persons might be advantageously enlisted. An hour's teaching would be sufficient to enable any intelligent man to undertake the duties of a vaccinator,\* and we may trust that but little persuasion would be required to enlist many active volunteers for this beneficent duty.

XX. *The Employment of Means tending to reduce the Mortality among the Children of the Poor.*

—————" 'Tis not a life,  
'Tis but a piece of Childhood thrown away!"

It is probably the most striking fact in the whole range of vital statistics that—throughout Europe,—from 22 to 36 per cent. of the total number of deaths occur in infants under

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was the largest sum disbursed to 3,000 members of the medical profession for attendance upon nearly 3,000,000 sick. There, however, appears to be some misapplication of figures here, as, according to Mr. Porter's calculation, the sum expended on the poor in 1849 was only £5,792,963.

\* "I have all along been very desirous to extend the benefit of vaccination to the tribes of the Niger; and have, at most places vaccinated, and recommended it to the Mallums (i.e. the priests and physicians) on every occasion. I explained its use to one or two Mallums, and to Mamansa, the chief's son. Mamansa was particularly struck with what was told him, and at once begged to be shewn how to operate himself. He inserted the lymph into the arms of six boys, and really with neatness and skill, although, I dare say, he never saw a lancet before in his life. But the people appear to have great imitative power."—*Dr. McWilliam's Expedition to the Niger*. Recent accounts shew that our medical officers on the West Coast are actively, and rather successfully, engaged in extending vaccination among the native tribes.



the age of one year, and that nearly one-third of the infants born perish under the age of five years.\*

Advancing one step further in our enquiry, we find that these startling numbers, in reality, merely represent a greatly diminished rate of mortality. According to Dr. Combe,—“in the twenty years subsequent to 1730, out of every 100 children born [in London]  $74\frac{1}{2}$ , or nearly 3 out of 4, died before they were 5 years old. In the succeeding twenty years, the proportion of deaths was reduced to 63 in 100, or less than two-thirds. Between 1770 and 1790 it was only  $51\frac{1}{2}$  in 100, or little more than one half. In the twenty years succeeding 1790, it was further reduced to  $41\frac{1}{2}$  in 100, or little more than two-fifths. And between 1810 and 1830, it was no more than 32 in 100, or less than one-third.”

\* The following interesting table, which bears all the marks of authenticity, is given in the *London Medical Gazette*, for February 5th, 1847 :—

Population.	Country.	Total deaths under 1 year.
Dalmatia, .. ..	394,028 ..	1,853 or 21.62 per cent.
England and Wales,	15,927,867 ..	77,394 „ 21.76 „
Austria, (Upper and Lower,) }	2,267,194 ..	27,618 „ 21.78 „ (?)
Galicia, .. ..	4,797,243 ..	49,710 „ 31.74 „
Moravia, .. ..	2,166,638 ..	19,326 „ 33.80 „
Bohemia, .. ..	4,174,168 ..	48,274 „ 34.57 „
Lombardy, .. ..	2,547,976 ..	28,676 „ 34.91 „
Venetian Territory, ..	2,168,573 ..	27,457 „ 36.03 „

Dr. Combe found that “the average mortality of Infants among rich and poor in England (and with little variation throughout Europe) is about 1 in every  $4\frac{1}{2}$  before the end of the first year of existence.” It appears, from Dr. Joynes’s *Statistics on the Mortality of Baltimore, U. S.* that during a period of 5 years, 25.59 per cent. of the total deaths occurred in infants under 1 year of age, exclusive of still-born.

A Belgian table, cited in *Chambers’ Information*, represents no less than a tenth of the entire mortality as taking place in the *first month* of life. A Report, published in the *American Journal of Medical Science* for July, 1848, shews that, in Philadelphia the mortality in the first year of life was found by the Government Census of 1840 to be 5,171, which is about 47 per cent. of the whole mortality under the 20th year (10,979), and about 27 per cent. of the mortality at all ages. The deaths under the 5th year amounted to 9,394, constituting about 86 per cent. of the whole mortality under the 20th year, and leaving but 14 per cent. for the succeeding 15 years of life. Compared with the mortality at all ages, that under the 5th year comprises 49 per cent., and that under the 20th year, 56 per cent. In like manner, Dr. Joynes has shewn that, in Baltimore 47.89 per cent. or nearly one-half of the deaths occur under the 5th year. In the year ending 30th June, 1841, there were registered 335,622 deaths in England and Wales; of these 140,089 were under 5 years, and 19,906 between 5 and 10 years of age.

In the report published by the Registrar-General in 1846, it is shewn that in 1844,—51,110 persons died in the Metropolitan districts; and that, of these no less than 20,650, or 44 per cent., were infants under 5 years of age. The census of 1841 shewed that out of a population of 15,911,757, England and Wales contained 2,099,152 infants under five years of age.



We have seen that the rate of mortality among children varies in different countries; and, as would be expected, it varies equally in different parts of the same country, as well as in different quarters of the same town.

Mr. J. Ross Coulthart states that, in the town of Ashton-under-Lyne, the deaths of infants under five years of age reach the enormous proportion of 57 per cent. to those of the whole population. From answers returned to queries by five hundred married operatives, it was found to be almost a universal case that there had been five children, of whom two were dead.\* Dr. Griffin† found that, among the families of the poorer class [in Limerick?] who came under his notice, “out of 66 who had more than 10 children born alive, 13, or one-fifth, had lost 11 or more of those children; and the aggregate mortality of those families was 159, or 12 each, which, if distributed among the same number of families who had the greatest number of children born alive, amounts to 79 per cent., and was probably higher.” He adds—“It has been remarked that production is often most rapid among a population in extreme wretchedness; and I strongly suspect that this is a consequence of the high mortality which occurs in such circumstances. It is the character of any influence which tends greatly to depress the powers of life, that it always bears heaviest on the tenderness of infancy and the feebleness of age. Now, as I find that the poor nurse their own children, there is generally an interval of about two years between the birth of one child and that of the next; but, if a child dies early on the breast, this interval will be much shorter; and if this occurs often, there will be a certain number born, as it were, *for the purpose of dying*.” It is found that 13,362 children under five years of age perish in seven years in Manchester above the mortality natural to mankind.‡ In the Parliamentary Tables of Population of 1841, it was shewn that, in 1839, the proportions of deaths under 5 years to 1,000 registered deaths, were:—Manchester 555·4; Leeds 528·1; Liverpool 507·6; Lancashire 458·5; West Riding of Yorkshire, 457·2; Lancashire (North of Morecombe Bay), Westmoreland, Cumberland, and Northumberland, 293·9. On the other hand, it is stated that in the French parish of Montreux, where the births are 1 to 46 of the population, 19 out of 20 complete the first year of life,

\* *Report on the Sanitary Condition of Ashton-under-Lyne*, 1844.

† As quoted in *Chambers' Information for the People*.

‡ *London Medical Gazette*, November 13, 1846.



and very nearly four-fifths of those baptised have been observed to receive the first communion.

In certain towns, the rate of infantile mortality is shewn to be progressively upon the increase; thus we learn that in 1821, the deaths of children under ten years of age in Glasgow was 1 in 75; in 1839 they were a little under 1 in 48; at the same time, the rate of mortality among the adult population of the town was undergoing a nearly proportionate increase.

The contrast between the rates of mortality prevailing respectively among the rich and the poor is no where more strongly illustrated than in the records of the deaths of children occurring in the various districts of London. Thus, one of the Registrar-General's Reports shews that, in the parish of St. George, Hanover Square, where 744 deaths were reported, 232, or 31 per cent., were under five years of age; whilst in Lower Westminster, (that is, St. John's and St. Margaret's parishes) in 813 deaths, 367, or 45 per cent., were also under five years of age; whereas, in St. Giles's, Bloomsbury, in 700 deaths, 426, or 60.80 per cent., were in children who had not completed their fifth year.\* In like manner we have seen that, in 1831, among the general population of England and Wales, 1 in 2.898207 died under 5 years of age; while, in the Society of Friends, only 1 in 4.558538 died at that period of life.

The subjoined table,† shewing the diseases which destroyed upwards of fifteen thousand children under five years of age in London during a single year, conveys so many important data that I cannot refrain from quoting it in extenso:—

\* *London Medical Gazette*, November, 1846.

† *Table of the principal diseases causing death in Children under five years in the Metropolis, during 1844:—*

Causes.		Disease.	Total deaths at all ages.		Under 5 years of age.	
Cold and at- mospheric Influences.	Specified. Contagion.	Scarlatina.	M. 1,545 } F. 1,484 }	3,029 ..	M. 1,126 } F. 1,025 }	2,151. or 71.02 p. ct.
		Small-pox.	M. 942 } F. 862 }	1,804 ..	M. 633 } F. 575 }	1,208. „ 66.96 „
	Measles.	M. 627 } F. 555 }	1,182 ..	M. 586 } F. 511 }	1,097. „ 92.80 „	
		Pneumonia.	M. 2,149 } F. 1,915 }	4,064 ..	M. 1,534 } F. 1,386 }	2,920. „ 71.85 „
	Hooping- [cough.	M. 565 } F. 727 }	1,292 ..	M. 534 } F. 687 }	1,221. „ 94.50 „	
		Croup.	M. 218 } F. 193 }	411 ..	M. 189 } F. 163 }	352. „ 85.64 „
	Carried over, ..		11,782	.. ..	8,949	



"According to this statement the most fatal malady amongst young persons is pneumonia, next convulsions, then scarlatina, and afterwards hydrocephalus; by which four diseases, 9,254 children under five years, or upwards of one-half the whole number of those comprised in the preceding table, died in the Metropolitan districts during 1844."

Many of the evidences which have been adduced of the effects of locality upon the health of children are striking and of great importance. Thus Dr. Guy, in remarking on the comparative fatality of disease in Town and Country, gives the following details:—"Diseases of infants,—Teething, Convulsions, Water in the Head,—Country 1,300; Town 3,500. Waste of Infant life under this head 2,200 a year. The Rev. Mr. Clay, of Preston, divided that town into four districts, according to the relative degrees of cleanliness and draining in each. In the streets well-conditioned in this respect he found that, of infants under 1 year old, 15 in the 100 died; in the streets moderately conditioned there died 21 in 100; in ill-conditioned streets 38 in 100; and in the worst-conditioned, the mortality among these infants was 44 in 100. Here, in addition to the effects of imperfect drainage and ventilation, the operation of ignorance, want, and neglect must, of course, be taken into account. The annual report of Mr. Simon, the medical officer of the city of London, for 1850, contains some important particulars on this point. Mr. Simon states that the city of London appears to be peculiarly unfavorable to Infant life. Of the whole 3,799 deaths in the previous year, 1,318 occurred under the age of 5 years; of the whole 2,752 deaths in 1850, 1,032 occurred under the age of five years. In the City of London Union, the deaths of

		Brought forward		..	11,782	..	..	8,949	
Often the above, or in consequence of other diseases.	Improper Feeding.	Teething.	M.	395	} 728	..	M.	392	} 725. or 99.58 p. ct.
			F.	333		..	F.	333	
		Diarrhoea.	M.	353	} 705	..	M.	257	} 499. „ 70.78 „
			F.	352		..	F.	242	
		Tabes Mesenterica.	M.	261	} 462	..	M.	229	} 407. „ 88.09 „
			F.	201		..	F.	178	
		Thrush.	M.	129	} 259	..	M.	127	} 256. „ 98.84 „
			F.	130		..	F.	129	
		Convulsions.	M.	1,545	} 2,736	..	M.	1,512	} 2,658. „ 87.11 „
			F.	1,191		..	F.	1,146	
		Hydrocephalus.	M.	982	} 1,763	..	M.	865	} 1,525. „ 86.48 „
			F.	781		..	F.	660	
		Total,		18,435				15,019. or 81.55 p. ct.	

*London Medical Gazette, January 8th, 1847.*



infants under 5 years old was 1—2·66 of the whole deaths, although their class numbers only 1—11·09 of the whole population; so that they die at more than four times (4·17) the rate which should have befallen them as participators in the average mortality of their district. This rate is not due to inappropriate diet, because it is highest during the first year after birth while the child depends for nourishment on its mother.” [An allowance should here be made for motherless and deserted children.] “Inasmuch as the few days of these children are passed chiefly within doors, their high mortality gives the least fallacious index of the wholesomeness of the dwellings in which they die, and affords the correctest means of judging of the sanitary condition of a district. Upwards of 1,200 of the deaths of the past two years have been due to Cholera and Epidemic causes which were unavoidable;” [?] “a large number beyond were referable to local and removable causes. It is notable that the proportionate mortality from scarlatina, measles, and hooping-cough, is greatest where the general death-rate is greatest. Among infants too, under similar circumstances, other diseases, not commonly accounted specific, assume a frequency and mortality warranting the belief that they are of endemic and avoidable origin. The hydrocephalus, convulsions, diarrhœa, bronchitis, and pneumonia, often referred to the irritation of teething, prevail in district localities with so marked a proportion to the causes of other endemic disease, that we may be sure of their partial and avoidable dependence on those local causes.”\*

It is still, then, with us as it was in George Herbert's time, that—

“When clothes are taken from a chest of sweets,  
To swaddle infants, whose young breath  
Scarce knows the way:  
They are like little winding-sheets,  
Which do consign and send them into death.”

We have a multitude of evidences leading to the natural conclusion that a very large proportion of the mortality which prevails among children depends upon those self-same removable causes of disease under which we have seen that communities at large languish and perish. Whenever household and personal cleanliness, temperance, morality, order, and industry, united with moderately cultivated reasoning powers, shall become the general characteristics of parents,

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\* As quoted in *Household Words*.



the rate of Infant Mortality will naturally and inevitably decline.

A few of the principal Removable Causes of Death in infancy and childhood must be considered in detail, although the subject is far too extensive and too important to admit of being fully discussed within the limits of a single chapter.

The chief of these destructive causes are :—

I.—The Crowding and Injudicious Management of Infants in Foundling Hospitals and Orphanages.

II.—Neglect on the part of Parents.

III.—The Systematic Administration of Narcotics.

IV.—The Confinement of Children in Ill-Ventilated School-Rooms.

I. Just ushered into the world, with new and unimpaired organs, and with wonderfully active and resilient powers of vital reparation, the young child would naturally be regarded as the most perfect of the Creator's mundane works. We may not be wrong in believing that the infant of a healthy race would need no miraculous change whatever in its present organization to enable it—did the All-Directing Will so order it—to remain permanent and undecaying among the creatures of Eternity:—there is nothing which should make us doubt that this exquisite mechanism of nerves and vessels might act for ever, were the hand of Providence constantly stretched above it to defend it from the attacks of outward causes of derangement and decay. But this has not been so willed—nearly every sapling has within it the principles of decay which, sooner or later, will convert it into dust; and we are compelled to view the young child as a being which, even when tended with the utmost solicitude, is menaced by a thousand deadly perils, and which a single day's privation, exposure, or neglect would inevitably bring to destruction. The constant unwearying tenderness of a mother's care will barely rear it to a condition of independent existence,—what then must be its fate if cast off from the source of its existence, deserted, and forced upon the mercy of strangers?\*

The means of rearing Infants in Foundling Hospitals, Lying-in Infirmaries, and Orphanages, have always formed a problem of great and trying difficulty.

\* It is very justly remarked, in *Chambers' Information*, that it is a fact, ascertained by statistics in opposition to common ideas, that illegitimate children have generally less of the elements of health and vitality than other children. The proportion of illegitimate to other births is here given as, for France, 1 to 12.5; Prussia, 1 to 13.1; England, 1 to 14.6. "In Paris, for 28 legitimate, there are 10 illegitimate births; in other and stricter terms the



In 1756, the Governors of the London Foundling Hospital received a large Parliamentary grant, on the condition that all children under a certain age should be received into the Charity. The whole process of admission consisted in placing the infant in a basket which hung at the gate, and in ringing a bell to make those within aware of the new arrival. During the three years and ten months which this singular experiment occupied, nearly 15,000 infants were received into the Foundling. One of the many evils which resulted from this mistaken course of charity, is shewn by the fact that, out of the whole 14,934 children received, only 4,400 lived to be apprenticed !\*

Dr. Combe mentions that, about a century ago, the work-houses of London presented the astounding results of 23 deaths in every 24 infants under the age of 1 year. "For a long time, this frightful devastation was allowed to go on, as beyond the reach of human remedy. But when, at last, an improved system of management was adopted, in consequence of a Parliamentary enquiry having taken place, the proportion of deaths was speedily reduced from 2,600 to 450 in a year. Here then, was a total of 2,150 instances of loss of life occurring yearly, chargeable not against any unalterable decrees of Providence, as some are disposed to contend as an excuse for their own negligence, but against the ignorance, indifference, and cruelty of man."

It was reported that, during the year 1850, 2,791 boys and 2,639 girls were received into the Neapolitan Foundling

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latter are in the proportion to the former as 1 to 2·84. In Stockholm, from the report of a recent traveller, the proportion is 1 to 2·3; that is nearly a third of the children born in that northern capital are illegitimate. In Berlin, the proportion has increased, since 1790, from 1 to 9, to 1 to 6." It is further mentioned that, at Gottingen, in 100 births there were 3 legitimate children still-born, and 15 illegitimate. When bearing the above facts in mind we also recollect that more than half a million of children are annually born in England and Wales alone, and that the number of destitute children supported by the Poor-Laws averages about 300,000, and further observe that a return published in January, 1852, shews no more than 3,453 mothers of illegitimate children in the receipt of English out-door Poor Law relief,—we may form some indistinct idea of the proportion in which this class of infant lives annually perish.

\* At present, according to Mr. Saunders, the Foundling supports about 360 children. Immediately after their reception the children are sent to one of the two stations in the country, East Peckham in Kent, and Chertsey in Surrey, with their respective neighbourhood. The nurses who take charge of the Hospital children receive 3*s.* 6*d.* per week for each, and a gratuity of 10*s.* 6*d.* at the end of the first year, if the child appears to have been successfully reared. The nurses in each district are under the supervision of paid inspectors.



Hospitals ; and that, during the same period, 1,334 boys and 1,319 girls died in those establishments. Places ordered in this manner are public curses, not public charities—vast morality and mortality traps, in which vice and death are alone encouraged.

We learn further from Dr. Combe, that the Orphan Asylum of Albany (New York) was opened in the end of 1829 with 70 children, the number being subsequently increased to 80. During the first 3 years, when an imperfect mode of management was in operation, from 4 to 6 children were constantly on the sick-list, and sometimes more ; one or two assistant nurses were necessary ; the physician was in regular attendance twice or thrice a week ; and the deaths amounted in all to between 30 and 40, or about one in every month. At the end of this time, an improved system of diet and general management was adopted ; and, notwithstanding the disadvantages inseparable from the orphan state of the children, the results were in the highest degree satisfactory. The nursery was soon entirely vacated, and the services of the nurse and physician no longer needed ; and for more than two years, *no case of sickness or death took place*. It is also stated that, since the new regimen has been fully adopted, there has been a remarkable increase of health, strength, activity, vivacity, cheerfulness, and contentment, among the children. The change of temper is also very great ; they have become less turbulent, irritable, peevish, and discontented ; and far more manageable, gentle, peaceable, and kind to each other.

In like manner, Mr. Edward Mallett\* mentions that in an establishment for the care of female orphans, out of 86 reared in 24 years, 1 only had died. These children were taken from the poorest classes. The average mortality on the whole population would have been six times as great. We have already seen† how decidedly the well-ordered condition of the buildings of the Metropolitan Association for Improving the Dwellings of the Poor conduced to the health of the children residing there in 1850-51.

II. Throughout the entire calendar of vice and misfortune which is ever open before the sight of those who closely study the condition of men in our great cities, there is no single passage at once so affrighting and so pitiable as that which displays the deaths of multitudes of infants resulting

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\* As quoted in *The Sanitary Report*.

† Note to page 86.



manifestly and immediately from the callousness and neglect of their parents. The error and its consequences are continually displaying themselves in every form and shade of turpitude and hideousness:—here are ill-trained, inexperienced, ignorant, and unwise parents, who watch death as he comes slowly upon their children, and yet never recognise his errand until his office shall have been fulfilled upon the victim of their folly; \*—there are vicious, criminal, intemperate parents, whose only act of kindness to their offspring is that they often permit their bodies to perish sufficiently early to spare them that contamination of soul which vile teaching and viler example would otherwise inevitably bring them. Again, we encounter parents upon whom the bitterness of abject poverty has wrought so deeply as to produce a prostration of energy, and an unresisting fatalism, which sees destruction doing its work upon those most dear to them, without summoning even one despairing effort to avert the blow, which, as it falls, is viewed with a sense of relief—a sentiment equally removed from brutal callousness or holy resignation. There are few medical men who have been in the habit of attending the London poor in their homes, who will not be able to recall the picture of a mother sitting weeping over the body of her dead child—weeping really bitter tears; but composedly uttering the words—“*It is better dead.*” She has known, for days, that her child was dying; she has scarcely put forth a single effort for its relief; she has neglected nearly every item of the advice which has been given her for its treatment,—this is evidently a time to which she has long looked forward; the blow is heavy, but it has not taken her unaware; she has, in fact, consciously allowed her child to die:—she could never sup-

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\* The Committee of Physicians and Surgeons at Birmingham, in their Report to the Poor Law Commissioners, write as follows:—

“The females are, from necessity, bred up from their youth in the workshops; as the earnings of the younger members contribute to the support of the family. The minds and morals of the girls become debased, and they marry, totally ignorant of all those habits of domestic economy which tend to render a husband’s home comfortable and happy; and this is often the cause of the man being driven to the ale-house to seek that comfort after his day of toil, which he looks for in vain by his own fireside. The habit of manufacturing life being once established in a woman, she continues it, and leaves her home and children to the care of a neighbour, or of a hired child, sometimes only a few years older than her own children, whose services cost her probably as much as she obtains for her labour. To this neglect on the part of their parents is to be traced the death of many children; they are left in the house with a fire before they are old enough to know the danger to which they are exposed, and are often dreadfully burnt.”



port it ; it could never have passed through the trials which lie between the present and future ; it might have outlived her, and so have died a worse death ;—at any rate it must have died soon, and so—“ God help her—it is better dead.” —Still further back in the darkness of this grim picture, we distinguish parents lost to humanity, lost even to the first instinct of the brutes,—who—barely restraining themselves from laying violent and murderous hands upon their tender offspring,—allow them to perish from neglect, that the blood-money of burial fees may ring upon their palms.\*

For the welfare and credit of humanity we must desire heartily that a time will come at which these records will be viewed as absolutely incredible :—when it will be thought that the advocates of sanitary reform pursued their object so incautiously that they finally learned to credit these and other absurdities, too wild and horrible to be regarded by men of sober reason.

III. The extraordinary prevalence of the abominable practice of drugging infants with opium has, of late years, been so fully canvassed by the public and the profession that a very brief notice of the evil will be sufficient here.

“ The custom first originated,” says Dr. Playfair,† “ according to all concurrent evidence, in the frequency of disorders having their primary seat either in the stomach or bowels, arising partly from injudicious feeding and improper nursing, but principally from the irritability produced by their continued exposure to a polluted atmosphere, and other physical causes of disease. The children thus disordered were taken to unlicensed practitioners, who prescribed opiates

\* The recent instances of child-murder prompted by this motive need not be recalled here. The following extracts from *Sanitary Economy* will suffice :—A collector of cottage rents, as his words are given in the *Health of Towns Report*, said—“ The poor people told me that they were unable to pay at that time ; but when a certain member of the family—generally a child—died, they would be able to pay. I have felt much shocked at this and I have told the people that it was very wrong to depend upon anything of the kind. Most of the children at the houses which I visit are in burial clubs.” Mr. Clay, in his Report on the Parish of Preston, says—“ A lady, a friend of the author of this Report, states that a young woman, whose services she required as a wet-nurse, having a child ill, she offered to send her own medical friend to attend it. The reply of the nurse was, ‘ Oh, never mind, ma’am, it’s in two burial clubs ! ’” Still again, Mr. Chadwick tells us that a minister in the neighbourhood of Manchester expressed his sorrow on observing a great want of natural feeling, and great apathy at the funerals. The sight of a free flow of tears was a refreshment which he seldom received. He was, moreover, often shocked by a common phrase amongst women of the lowest class,—“ Ay, ay, that child will not live, it is in the burial-club ! ”

† *Report of the Health of Towns Commission.*



as a general remedy, and their mothers mistook the soothing effects produced by narcotics for proofs of improvement, and themselves continued the practice. They soon discovered that the administration of narcotic drugs prevented restlessness in the child, enabling them to pursue their ordinary avocations : and thus a practice, often originating in disease, has become habitual, even in cases where disease did not exist. Druggists, who vend such narcotic preparations, speak as to the extent of their use ; and their evidence is perhaps the more to be depended upon, as it is their interest to diminish rather than to exaggerate the extent of the evil." Dr. Playfair goes on to give the evidence of "a respectable druggist in Manchester, whose customers are, however, entirely of the poorer class, among whom it may safely be said that there is scarcely a single family in which this practice does not prevail. The way it is done is this : the mother goes out to her work in the morning, leaving her child in charge either of a woman who cannot be troubled with it, or with another child of perhaps ten years old. A dose of 'quietness' is therefore given to the child, to prevent it being troublesome. The child thus drugged sleeps, and may waken at dinner-time ; so, when the mother goes out again, the child receives another dose. Well, the father and mother come home at night quite fatigued ; and, as they must rise early to begin work for the day, they must sleep undisturbed by the child ; so it is again drugged, and in this manner young children are often drugged three times in each day. This druggist states further, that he sells, *in retail alone, about five gallons per week of 'quietness' and half a gallon of 'Godfrey ;'* the strength of the former preparation is such as to contain one hundred drops of laudanum in an ounce ; a single tea-spoonful is the prescribed dose ; so that allowing one ounce weekly to each family, this one druggist supplies 700 families every week. A melancholy characteristic of this fatal practice is the unconcern with which it is followed. Another druggist says, there is no dread of laudanum now ; it is often used for the same purposes as 'quietness.' The usual dose to produce sleep in a restless child is eight drops, and this being, like the other, gradually increased to three doses a day, amounts to twenty-four drops. We are informed that '*three druggists,*' whose evidence is quoted, all of acknowledged respectability, are selling respectively five and a half, three and a half, and one,—in all ten gallons weekly ; two of them testifying that *almost all the families* of the poor in that district habitually drug their



children with opiates; and the third, after a lengthened examination of all the customers who attended a pawnbroker's shop, kept by a relative of his own, giving a statistical result, that five out of six families in his district were in the habitual use of narcotics for children." It is further stated that "returns have been obtained from almost all the chemists and druggists in Preston of the quantity of these mixtures sold by each; the aggregate of the whole quantity indicates that, allowing half an ounce per week to each family, upwards of 1,600 families are in the habit of using 'Godfrey's Cordial,' or some other equally injurious compound." Similar evidence is adduced as afforded by druggists in Wigan, Rochdale, Bury, Ashton-under-Lyne, Clitheroe, and Liverpool. "In fact, in the whole of Lancashire and the factory districts generally, the evil has been adopted with the most reckless disregard of consequences. This practice, as well as many of the other causes which deteriorate the value of infant life, appear to be in a great measure attributable to early and improvident marriages; the consequences of which, necessarily, are—penury, carelessness, and often intemperance on the part of the parents, entailing disease, privation, neglect, and early death upon their offspring." Dr. Playfair adds that—while much of the great mortality which occurs, especially among the first and second children of factory-workers (a larger proportion of those children surviving which are born after the mother has relinquished her factory employment), "may, doubtless, be traced to the extremes of poverty so often met with in manufacturing districts; there is ample evidence of the waste of infant life from the causes in question (neglect, dosing with opium, and injudicious feeding); for, in Wiltshire and Dorsetshire, where the wages are notoriously low, only 11 per cent. of all the children born die before they gain one year of age, while 17 per cent. are carried off in Lancashire. Under such circumstances, it can occasion no surprise that thousands of infants are swept off by hydrocephalus, the irritation of teething, and convulsions;—the only cause for wonder is that thousands more struggle on to perish from strumous disease, or to burthen society as idiots and lunatics."\*

We have already seen how deservedly Liverpool has gained the character of being the most unhealthy town in Eng-

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\* "In the absence of positive data, it is believed that there are a greater number of idiots and imbeciles in this province [Lancashire] than in any other part of England."—*London Medical Gazette*, July 27th, 1849.



land—evidently in a great measure from the excess in its infant mortality; and we have learned that nearly six-tenths of the mortality in Ashton-under-Lyne occurs in infants under five years of age:—we are, therefore, prepared to hear that 16,000 persons die in Manchester, in seven years, over and above the number that die in Surrey, within the same period, out of a more numerous population; and that 13,362 children under five years of age perish, in seven years, in that town, above the mortality natural to mankind.\*

Dr. Playfair looks for the remedy of these evils chiefly in the education of the working classes. Generations, however, must pass away before the effects of this great panacea can be practically felt. In the mean time, some mitigation of the evil might result from a stringent clause in the proposed "Pharmacy Bill"—fixing severe penalties upon those "highly respectable chemists and druggists" who render themselves accessories to systematic and wholesale murder, by the sale of penny-worths of "venomous distilment" to ignorant and inexperienced wretches who, in nine hundred and ninety-nine cases out of a thousand, have not the slightest conception that, in thus drugging their infants, they "have called DEATH to stand and watch beside the crib, to hold his cold clenched hand over the baby's mouth, and fix it in a spell, until they wake and come to it again":—† that—

"Sleep binds them fast, only their breath  
Makes them not dead.  
Successive nights, like rolling waves,  
Convey them quickly, who are bound for death."

The traitor who is found vending arms to his country's enemies is liable to be quartered alive:—the fate of a murderer attends the wretch who looks on encouragingly while ordinary homicide is at work, or who, greedy for a share of plunder, grasps and holds back the quivering hands that fight for life—but there is no punishment assigned in *this* world to the "respectable" villany which, every seven years, smirkingly metes out the deadly potions of thirteen thousand beings stamped with the image of God and still retaining the purity of His angels.

IV. The ill-effects of penning up large numbers of children in small, low, and badly-ventilated School-rooms has en-

\* See an excellent paper on this subject by Dr. James Black.—*London Medical Gazette*, December 11th, 1846.

† Morley's *Tracts on Health, for Cottage Circulation*: 1847.



gaged considerable attention. A few examples illustrating the injury which this practice inflicts upon the constitutions of the young will be sufficient for our present purpose.\* The following fact appears in the evidence given before the Health of Towns Commission.† In 1832, there were 600 pupils at the Norwood School, amongst whom scrofula had broken out extensively, and great mortality had occurred; which was ascribed to bad and deficient food. The case was investigated by Dr. Arnott; the food was found to be most abundant and good; and defective ventilation, and consequent atmospheric impurity, was assigned as the cause. Ventilation was applied by his direction; the scrofula soon after disappeared; and 1,100 children are now maintained in good health where the 600 before ventilation were scrofulous and sickly.”

Again in 1845, Dr. Playfair describes the public schools of Lancashire as too frequently extremely defective in respect to ventilation: the architects of such edifices having considered it quite sufficient to provide a certain number of doors and windows, without also furnishing atmospheric purity. Of 75 schools examined in Manchester, 35 were badly ventilated. When the pupils come from houses of a respectable order, the injury they sustain in school is not very observable; but those who live in cellars or other badly-ventilated dwellings, suffer prodigiously from the bad ventilation in their schools. In one school in Manchester 70 per cent. of the infants living in cellars are always absent from sickness. In another, 27 per cent. of the cellar occupants are absent from sickness; while only  $3\frac{3}{10}$  per cent. of those who live in houses are absent from the same cause. In all the schools, the average allowance of space to each child is about 5.9 cubic feet; and when it is considered that nearly double this amount of air passes through the lungs of a child, and is vitiated every hour, it cannot be considered surprising that the inmates of public schools, thus deprived of an adequate supply of fresh air, should suffer such a large amount of sickness, or that they should exhibit in their outward appearance the signs of a weakly and puny childhood. It is quite amazing to observe the difference in the appearance of children attending a well-ventilated and well-regulated school, and of those who attend schools of an opposite

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\* The subject is ably discussed at some length in an article entitled “Public Health:—Schools”; in *Chambers' Journal*, vol. iv. N.S.

† Vol. i, p. 78.



description, especially such as are usually denominated cottage schools. The sanitary disadvantages under which children labour in most of our schools, are so much opposed to their mental progress, that nothing would be more conducive to the rapid advance of education than attention to structural arrangements.\*

Dr. Fleming's evidence with regard to the condition of schools in the same town is of similar purport. Dr. Reid, in his report on the Northern Coal-Mining Districts, mentions that, at the Blue-Coat School in Durham, out of 387 boys, about 60 were on the sick list; and in the girl's school, immediately above it, there were more than 20 unwell among 234. In an infant school in the same town, 30 children out of 90 were absent from illness (scarlet fever). There were no means of systematic ventilation; a slaughter-house and a piggery were noticed opposite the principal window.

Early in 1851, a public meeting was convened under the auspices of the Bishop of London, Lords Shaftesbury and Carlisle, Sir R. Inglis, Sir James Clark, and other philanthropists, with a view to the establishment of a HOSPITAL FOR SICK CHILDREN in London. It appears that this benevolent and greatly-needed undertaking is in progress. The erection of many similar hospitals throughout the country may yet be hoped for. One of the objects of this movement is that of training women to be efficient children's nurses. Still, it will doubtless be borne in mind, that a young infant fares but ill in a public hospital unless its mother be admitted with it.†

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\* *Report of the Health of Towns Commission.*

† In Paris, Berlin, Turin, Frankfort, Brussels, and Munich,—in Hamburg, St. Petersburg, Moscow, Vienna, Prague, Pesth, Copenhagen, Stuttgart, Gratz, Brunn, Lemberg, and Constantinople—there are hospitals for sick children. There was not one in all England until the other day. No hospital for sick children! Does the public know what is implied in this? Those little graves two or three feet long, which are so plentiful in our church-yards and our cemeteries—to which, from home, in absence from the pleasures of society, the thoughts of many a young mother sadly wander—does the public know that we dig too many of them? Of this great city of London—which, until a few weeks ago, contained no hospital wherein to treat and study the diseases of children—more than a third of the whole population perishes in infancy and childhood. Twenty-four in 100 die during the two first years of life; and during the next eight years eleven die out of the remaining seventy-six. Our children perish out of our homes, not because there is in them an inherent dangerous sickness (except in the few cases where they are born of parents who communicate to children heritable maladies), but because there is, in respect of their tender lives, a want of sanitary discipline, and a want of medical knowledge. What should we say of a rose-tree, in which one bud out of every tree dropped to the soil



XXI. *The Maintenance of a Strict Hygienic System among Sailors and Soldiers, at Home and Abroad.*

It will, of course, always happen that the evils which obtrude themselves within our personal sphere of action, and which are actually presented tangibly to our senses, make an infinitely deeper impression upon our mind than those which we understood to be in operation to a far wider and more destructive extent in places far removed. On this principle it happens that,—while the occurrence of a severe epidemic which should destroy some hundreds of the inhabitants of one of our own cities, would be observed with the greatest consternation by the people at large; and while the services of the medical men who were most successful in checking this malady would scarcely fail to meet with general approval,—the deaths of thousands of our fellow-countrymen who annually perish from diseases contracted during their public service in the colonies, produce regret only in the minds of those individuals at home who personally suffer from the loss of friends thus untimely snatched away, while the public at large consider so disastrous a sacrifice of life merely as a thing of course; and if they ever reflect upon the matter for an instant, regard the efforts of those naval and military surgeons, whose constant task it is to strive against pestilential disease in climates where its devastations never cease, as the mere common-place performance of a routine service. There are, however, two important facts which stand forth with striking reality upon the very threshold of this subject; namely, that, in the first place, by far the largest proportionate sacrifice of human life which occurs in the British dominions is that which is produced in the colonies by sickness among the sea and land forces employed by Government for the protection of those territories;—that great as is certainly the loss of life which is the indispensable attendant of our national victories, the constant and regular destruction of existence which the diseases and hardships of foreign climates work among our troops and seamen is immeasurably greater; that, in fact, “they who die of the pestilence are

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dead? We should not say that this was natural to roses; neither is it natural to men and women that they should see the glaze of death upon so many of the bright eyes that come to laugh and love among them, or that they should kiss so many little lips grown cold and still. The vice is external. We fail to prevent disease; and, in case of children, to a much more lamentable extent than is well known, we fail to cure it.—*Dickens' Household Words.*



more in number than those who perish by the sword!"\*—And, in the next place, that it is entirely owing to the researches and exertions of the medical officers of the public services that such sacrifice of life is not immeasurably greater than it at present is;—that, owing to the suggestions of gentlemen belonging to these classes, the mortality among sailors and soldiers has, for more than a century, been gradually upon the decrease, and that it is only from the same source that a further diminution of the evil can reasonably be expected.†

With regard to the mortality prevailing in the British Navy, it has been stated, and doubtless with much accuracy, that, between the years 1755 and 1762, not less than 130,000 English naval seamen died of disease,—two-thirds of them from Scurvy. We have already seen that the number of cases of scurvy received into Haslar Hospital in 1780 was 1,457, while the admissions for this disease in 1806 and 1807 were only two! We learn, further, that on the return of the Channel Fleet (consisting of twenty-four sail of the line, with frigates, &c.) to Torbay, in September 1800, after a four months' cruise, only sixteen men were sent to hospital. In the years 1810, 1811, and 1812, the average mortality was  $3\frac{1}{2}$  per cent., and it is stated to have been as low as 1.4 per cent. since 1830. There is certainly something wonderfully cheering in the statement that the mortality in the entire English Navy falls below the average which prevails among men of corresponding age at home. Still, certain details contained in

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\* The following valuable remarks on this subject appeared in the *Quarterly Review*, for 1846 :—"During the last three years of the Peninsular war, the total number of deaths in the British Army, amounted annually to about 16 per cent. of the whole force. Of these only 4 per cent. died in battle, or of wounds which proved fatal soon after. The number of men sick in hospital usually averaged about one-fourth of the whole. In less than three years and a half, out of a force the average strength of which was 61,500 men, nearly 34,000 died, and of these only one-fourth fell by the sword; and this enormous mortality occurred among a body of men all of whom, a short time previously, must have been in the healthiest vigour of youth, or prime of manhood; so that it required the annual sacrifice of 6,400 able-bodied men, to keep in the field a working force of less than 50,000 men! If such was the amount of suffering and waste of life when every expedient was adopted that foresight could suggest to provide proper food and raiment, and every other attainable comfort, both in sickness and in health, what must it be when these precautions are neglected? Of such neglect and its terrible and execrable consequences, Napoleon's campaigns of 1812 and 1813 afford memorable examples. From want of proper supplies alone, the French troops perished literally by hundreds of thousands!"

† It may be right to mention that the above remarks appeared in print some years before the author had any idea of becoming an army surgeon.



a Parliamentary Return,\* made up to the year 1845, shew that an extraordinary disparity exists between the respective rates of mortality prevailing at our several naval stations; and that, at more than one station, the annual sacrifice of life is calamitously large. Thus, while the rates of mortality on the South American, Mediterranean, and Home Stations are respectively 7·7, 9·3, and 9·8 per 1,000, the ratio of deaths is 15·1 in the East Indies, and 18·1 in the West Indies; while, during the 21 years antecedent to the compilation of the return, the annual rate of mortality, from disease alone, in the African Squadron, amounted to 58·4 per 1,000.† Improved systems of treatment, then, aided by well-directed sanitary measures, have done much towards rendering our seamen a robust and long-lived race:—still, it is evident that this great object remains but partially fulfilled. The disease which annually more than decimated our fleets now occurs only with sufficient frequency to prove that surgeons are possessed of absolute specifics for its cure; an English ship of war has long been proverbially the most absolutely cleanly of human habitations; the rations issued to the seamen are generally plentiful and wholesome; and, of late years, the amended navigation laws have tended greatly to improve the sanitary condition of our merchant sailors; nevertheless, many facts combine with the above figures to shew that much is still required, and that much may still be effected towards increasing the expectation of life among our sea-faring men. It is unsafe under any circumstances, and it would be especially unwise in this instance, to attempt to derive sweeping deductions from a few scattered data: still, when we carefully review the details of the planning and results of the disastrous Niger Expedition, and give their due weight to the subjoined facts, we shall scarcely be able to avoid the conviction that a thoroughly organised system of sanitary conservancy is still wanting in the English Navy.‡

\* *Report on the Climate and Diseases of the African Station*, p. 177.

† It will be borne in mind that, in 1850, the extreme rates of the mortality throughout England and Wales were 14 per 1,000 (in a district of Northumberland) and 33·5 per 1,000 (in Liverpool). In that year, there were 31 vessels carrying the pendant employed on the African Station; of course, including those on the southern coast. In 1848, some arguments were brought forward in Parliament tending to shew that there is nothing serious to be apprehended on the score of the unhealthiness of that climate. A very able answer to these, however, will be found in the 42nd vol. of the *London Medical Gazette*, p. 498.

‡ The above remarks were ready for the press when the Home Journals announced that an enormous quantity of "Preserved" Meats, which had been supplied to the Admiralty for the use of the Navy and delivered into store



We learn from Dr. John Wilson's valuable *Medical Notes on China*,\* that during the late Chinese War the 98th Regiment left England in a ship of seventy-two guns, in which, including detachments of other corps, women, children, and the ship's company, were embarked together close on *one thousand three hundred persons*, and that the crowding of masses of men in so small a space during so long a voyage, must necessarily have rendered them altogether unfit to endure subsequently the trying effects of an unhealthy climate. The following report affords a vivid picture of the condition of this unfortunate corps, after exposure to the climate of Chusan during a single season :—

“The search for a healthy-looking man is vain; everywhere, stretched helplessly on deck, suspended in cots and hammocks, or tottering unsteadily a few paces, are seen the subjects of wasting disease, with the sallow, earthy complexion, shrunk features, emaciated frames, feeble limbs, and down-cast looks, so sadly characteristic of miasmatic poisoning. The regiment entered the river, little more than three months ago, upwards of eight hundred strong, having at the time a very moderate sick list; but seventy rank and file are capable of performing the lightest duty. It is known that one hundred and seventy have died; but the total number of deaths till this date is not known, part of the regiment being still on the river on board a transport as an hospital. But, knowing the loss which the regiment has already sustained, and looking at the condition of the regiment which is now here, it may be foretold that half the men who entered the Yang-tse-kiang in health will never again be fit for military service. This is a very formidable loss to be suffered in so short a period by disease, no fatal casualty from battle having occurred. Other portions of the land as well as the sea force sustained considerable injury and loss, but none of them anything like this corps.”†

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at the Clarence Yard in November, 1850, “warranted equal to sample and to keep sound and consumable five years,” were not only found to be in a horribly putrid condition, in consequence of defective curing and manufacture, but were also, in a very large proportion of instances, so completely made up of diseased flesh and abominable offal that it is difficult to view the matter otherwise than as a diabolical combination of malice and fraud practised upon the Government and the seamen. It is stated that these vile canisters were sent from Moldavia. Certainly none of the enormities of the *English* contract system ever equalled this.

\* London, 1846.

† In perusing this narrative of disaster, occurring in the very district which generated the Black Death of the fourteenth century, it is impossible



The following striking circumstances are of still more recent occurrence. H. M. Steamer *L'Eclair* sailed from Devonport in November, 1844, for the coast of Africa, having a crew of 146 officers and men. She remained on that station until the 23rd of July, 1845. Up to that time, she had lost nine men from the common coast fever. Four days after sailing from Sierra Leone, one man died with fever and black vomit; this was the first case of the kind which had taken place. During her voyage to Gambia and Goree and thence to Buena Vista, where she arrived on the 21st of August, eighteen men were attacked with the same fever, with black vomit:—of these, thirteen died. At Buena Vista, the disease continuing to spread rapidly amongst the crew, the sick and well were landed, on or about the 30th. A fort upon an island about half a mile distant from Porto Sal Rey, the chief town, appropriated for the accommodation of the seamen and sick, and the officers lodged in the town. Every measure was taken to purify the ship by washing and white-washing, fumigation, &c., all the Kroomen remaining on board, with the exception of six employed in attendance upon the sick. The disease, however, continued to prevail amongst the officers and men on shore, thirty-one men dying between the 21st of August and the 13th of September. Upon the report and recommendation of three naval surgeons, the ship's company were re-embarked, and sailed for England on the 13th of September, a surgeon, Mr. Maclure, and an assistant-surgeon, Mr. Coffey, with seven seamen, volunteering their services on board. The Captain of the *Eclair*, having been taken ill the day before leaving Buena Vista, died on the 16th. Mr. Maclure died on the voyage to Madeira, and one of the volunteer

to avoid recalling the fate of Hosier and his seamen, at Carthage, early in the last century:—

“Sent in that foul clime to languish,  
Think what thousands fell in vain.  
Wasted with disease and anguish,  
Not in glorious battle slain.”

or, following another poet's description of the same tragic course of events:—

——— “You, pitying see,  
To infant weakness sunk the warrior's arm;  
See the deep racking pang, the ghastly form,  
The lip pale quivering, and the beamless eye  
No more with ardour bright; you hear the groans,  
Of agonising ships, from shore to shore;  
Hear nightly plunged amid the sullen waves  
The frequent corse; while on each other fixed,  
In sad presage, the black assistants seem  
Silent to ask whom Fate will next demand.”



seamen was taken ill of the fever and recovered. Upon the arrival of the steamer at Madeira, the authorities refused permission to communicate with the shore, but here Mr. Bernard, a naval surgeon, volunteered his services, and was received on board, with two seamen. She arrived at Spithead on the 28th of September, with a loss of 61 men and officers, and with the fever still raging in the most severe form, being attended with black vomiting. On the 3rd of October, Sir W. Pym, the Superintendent-General of Quarantine, and Mr. James Arnott, made a report to the Admiralty upon the state of the vessel. Upon their recommendation, the *Eclair* proceeded to the Quarantine Station at Standgate Creek, and those of the crew (41 in number) who had escaped the fever were removed to a clean vessel, while the convalescents were placed in another. In addition to the deaths already enumerated, two had occurred between the date of the arrival of the *Eclair* and the despatch of the above report. At Standgate Creek, Mr. Sydney Bernard, the surgeon who so nobly volunteered his services at Madeira, Lieut. Isaacson, and Mr. Saunders, the pilot who brought the vessel round from Portsmouth, fell victims to the fever; Mr. Coffey was very severely attacked. It was also stated that seven men took the disease on the 15th of October, and that a person engaged to superintend the Kroomen in clearing the vessel's hold was also seized with fever, but not in a severe form. The disease also attacked Dr. Rogers who volunteered his services at Standgate Creek. Towards the end of December, Mr. Rendall, the consul for the Cape Verde Islands, reported that, on the 20th September, seven days after the *Eclair* left Boa Vista, one of the white Portuguese soldiers who had been housed at the island with the crew of the *Eclair* had died in the fort. The following day, another also died, and the remaining soldier in the fort (coloured man) was reported sick. Another coloured soldier was sent to assist his comrade, but he being also taken sick, the authorities at once abandoned the fort and island, and caused the two sick men to be lodged in the town. The consul further stated that, up to the 9th October, extraordinary heat, and the fall of a large quantity of rain having been experienced—events which were surprising to the oldest inhabitant—fever began to shew itself in the town, and the first fatal case was reported to have taken place in the house whither the two coloured soldiers from the fort had been brought, and recovered from their sickness. Each succeeding day, to the end of the month, gave two, and sometimes three, cases daily; all occur-



ring within the immediate neighbourhood of the house where the first death took place. The fever had continued to rage up to the first week in December; and at that period, it had found its way into almost all the country villages, the deaths averaging seven and eight daily. The Portuguese surgeons declared the disease to be a fever of the worst description, and of a most contagious nature:—black vomit was one of the leading symptoms. Early in the following March, it was reported that the sickness still continued in the villages, and that the number of deaths then amounted to upwards of 400.

Upon these reports, Dr. McWilliam, a gentleman whose distinguished services and experience in the unfortunate Niger Expedition rendered him pre-eminently qualified for the duty, was sent to Boa Vista by Government to enquire into the alleged importation of fever into that island. Dr. McWilliam's investigations were, upon the whole, confirmatory of Mr. Rendall's statements. They shewed that, on the 14th of September, the day following the departure of the *Eclair*, a Portuguese corporal of the guard stationed in the fort during and immediately after its occupancy by the crew of that vessel, was attacked with fever, and died in three days, delirious, and vomiting a black fluid. Another European soldier was similarly seized on the day following, and died on the fourth day with fever, delirium, and black vomit. Two Negro soldiers attended these men during their illness, and subsequently removed and interred their bodies. Upon their being relieved from duty at the fort, it was deemed advisable not to admit these two Negro soldiers at once into the barracks, but they were sent to a house in the town where they remained about eight days; they were attacked with fever soon after leaving. The very first case of fever in the town appeared in the room adjoining that in which these two men were lodged. A Portuguese woman who lived in that room, and who was constantly with the soldiers and cooked their victuals, was attacked with fever in three or four days after these men left the town, and died with high fever, delirium, and black vomit. Subsequently, fever of the same character appeared in the neighbouring houses.

During the latter half of November, and throughout December, 1845, and part of January, 1846, the disease was at its height in the town, sometimes six or seven persons dying in one day. By the end of April, the town of Porto Sal Rey was quite free from fever, but not less than 1 in 2·1 of the Por-



tuguese, 1 in 1.1 of the English and American, and 1 in 13.4 of the native population of the town, had fallen victims to the fever. In April, 1846, the fever prevailed (but without the symptom of black vomit) under Dr. McWilliam's observation at Joao Gallego, one of the eastern villages; and in May, Dr. McWilliam witnessed the existence of this fever with black vomit at Moradinha, another village on the island. The first person who was attacked in Moradinha had visited Joao Gallego on the 15th of May, and was laid up with fever on the 20th of the same month. Dr. McWilliam found that, in each town and village in the island, the disease first appeared in a single house which became an irradiating focus for its dispersion in all quarters. The decision at which Dr. McWilliam arrived was that the disease with which the crew of the *Eclair* were afflicted, that which proved fatal to the European soldiers at the Fort, and that which soon afterwards prevailed on the island of Buena Vista, were identical. Subsequently to Dr. McWilliam's return to England in September, 1846, the fever again made its appearance in Buena Vista, and Dr. King was sent out to re-investigate the matter. In the very able report which that officer subsequently laid before Parliament, the main details of Dr. McWilliams' report are confirmed, and it is admitted that Buena Vista and the other islands were free from fever when the *Eclair* arrived there: but it is argued that the fever which attacked the people of the island was not communicated by the impested crew, but was merely of coincident occurrence, and depended solely upon endemial causes.

The subsequent history of the *Eclair*, as given by Dr. King, furnishes the most striking and important feature in this very remarkable and instructive history. In November, 1846, about twelve months after the disappearance of the fever at Standgate Creek, the *Eclair* was commissioned at Woolwich under the name of the *Rosamund*. It was observable that none of her former crew would consent to re-join her. During the time of fitting out, four cases of typhus fever occurred on board, two of these proved fatal at the Hospital. Typhus, however, was then prevalent at Woolwich. The steamer left for the Cape on the 23rd of February, 1847. Three days after sailing, one of the men was affected with slight febrile symptoms, which gradually passed off sufficiently to enable him to work. After the ship entered the tropics, however, the disease assumed a new and alarming character; and when off the island of St. Nicholas, and almost in sight of Boa Vista, the man died,



having had, for two days previous, black vomit and other characteristic symptoms of the yellow fever. Upon the arrival of the vessel at Ascension a few days afterwards, Dr. King went on board with a view to enquiring into her sanitary condition. He found one man severely ill with fever; a lad who was taken ill that morning presented, even at that early stage, such apparent indications of a low malignant fever as to induce Dr. King to express his opinion that he probably would not survive twenty-four hours. It was decided to remove these patients, and two other lads, who slept in the same part of the ship and who were found to have incipient fever, to the sick quarters on the Green Mountain. Before their short journey thither was half accomplished, the poor boy became delirious, and, without having had one favorable symptom from the commencement of the attack, he died at the sick quarters, after an illness of thirty-six hours. The other three patients recovered slowly. "The patients themselves," says Dr. King, "attributed their illness to foul air in the fore-part of the ship; one of them said he suffered so much from an abominable stench in the boatswain's store-room that he represented the circumstance, and obtained permission to cut a hole in the floor, which exposed to view *a considerable quantity of soft mud; and five or six buckets full of it, mixed with decayed shavings, and emitting an offensive odour, were removed at the time.*" "It appears, then, that besides an unusual number sleeping in the fore-cockpit, some of them at least had been exposed to a morbid miasma *exhaled from a festering mass of filth in the bottom of that part of the ship.* The quantity of mud, no doubt, was small in comparison with what had accumulated when the vessel arrived at Spithead from the coast of Africa; yet the malaria eliminated from that small and circumscribed focus was equally virulent in its operation, and produced the same disease in a few who were placed within the sphere of its influence."

Sifted entirely from controversial matter, the above detail of facts is probably the most suggestive history, as bearing upon the necessity for a thorough system of sanitary regulation in ships, that has ever been laid before the profession. A similar course of events is not very likely to occur again in a Queen's ship:—still, seeing that such dire calamities arose but six years since in one of a class of vessels, the internal arrangements and cleanliness of which have been regarded as almost approaching to perfection—



what may be anticipated in incommodious transports and crowded emigrant ships, and in old and dirty trading vessels freighted with hides, bones, horns, green wood, or any other decomposing animal or vegetable matters which the owners may choose to place on board without consideration for the lives of the crew?\*

It appears, from tables which were adduced by Mr. Balfour in 1845, that out of nineteen of the principal foreign stations, there were then not less than fourteen in which the yearly mortality among the British troops was comparatively greater than the average annual mortality of the whole English population, and this too among picked men, at the most vigorous period of life, upon whom the natural processes of decay had never acted.

The following table, compiled from those by Mr. Balfour and other authorities, although replete with sources of sta-

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\* The statements of Messrs. Grainger, Bowie, and De Vere, and of Drs. Duncan, Sutherland, and Combe, as laid before the Board of Health, a few years since, with reference to the wretched and fatally dangerous manner in which the crews and passengers were lodged and found in trading and emigrant vessels sailing from London, Liverpool, Glasgow, and other ports, are replete with striking illustrations of the necessity for strict sanitary conservancy on ship-board. They will be found cited in detail in *Sanitary Economy*, p. 165. It is, however, to be trusted that few such records will be forthcoming in future, under the operation of the "Passenger Act" (12 and 13 Vict. c. 33) and its Amendments, and of the "Act for Improving the Condition of Masters, Mates, and Seamen, and Maintaining Discipline in the Merchant Service," (13th and 14th Vict. c. 93). This latter Act contains some very important clauses regulating the amount of sleeping space to be allowed to each man, providing for the due ventilation of such space, and appointing Medical Inspectors under the Board of Trade and the Local Marine Board, to inspect the medicines, lime or lemon-juice, sugar, and vinegar, required by law. The Board of Trade is also empowered to enforce the appointment of qualified medical officers, and the due supply of medicines for emigrant ships. It has been abundantly proved that care and liberality are alone required to secure the general healthiness of persons on shipboard. All evidence tends to support Mr. Grainger's conclusion that "*if proper measures are adopted, there is no reason why a single case of typhus should occur on shipboard.*"

The following note is by Dr. Willis. "In 1779, the proportion of deaths in the Royal Navy of Great Britain was 1 in 8 of the employed! In 1811, it had fallen to 1 in 32; but this was not yet the term it was destined to reach; from 1830 to 1836, it was actually no more than 1 in 72; and this with deaths from every cause—wounds, drownings, &c., taken into the reckoning: from actual disease the mortality was but 1 in 85! Well may Dr. Wilson, in his admirable *Reports on the Health of the Navy*, (London, March, 1840) say:—'of the many improvements that have taken place within the last fifty years in the physical and social condition of the people none is to be compared with that effected in the health of seamen in the public service, because none approaches it in magnitude and importance.' And I cannot help adding, that I fully concur with him when he adds:—'for this striking and momentous change, humanity and the country are chiefly indebted to ABUNDANCE OF WHOLESOME NUTRITIOUS FOOD.'"



tistical error,\* conveys some very painful, but suggestive truths, the practical bearing of which will be recognised at a glance :—

Country.	Annual Rate of Mortality per 1,000 men.			
	Dr. A. S. Thomson.	Mr. Balfour.	Staff Surgeon Shanks.	Colonel Sykes.
Great Britain, ... ..	(1819-28) 15'	(1844) ... 14' (Which was also the lowest rate of general mortality throughout England and Wales in 1850.)	...	...
New Zealand, ... ..	(1850) 8½	...	...	...
Australian Continent, ...	...	...	(1844-50) 11	...
Cape of Good Hope, ...	...	15.5	...	...
Nova Scotia and New Brunswick, ...	...	18.	...	...
Malta, ... ..	(1824-31) 15'	18.7	...	...
Canada, Upper and Lower, ...	(1816-32) 11'	20.	...	...
Gibraltar, ... ..	(1816-22) 20'	22.1	...	...
Ionian Islands, ... ..	...	28.3	...	...
Mauritius, ... ..	...	30.5	...	...
Bermudas, ... ..	...	32.3	...	...
Annual Rate of Mortality in London, 1849, (Cholera Year) ... .. 33.3				
Highest Rate of General Mortality in England and Wales 1850, ... .. 33.5				
St. Helena, ... ..	...	35.	...	...
Tenasserim Provinces, ...	...	50.	...	...
Madras Presidency, ... ..	(1827-30) 48'	52.	...	(1825-44) 38.460
Bombay Presidency, ... ..	...	55.	...	50.780
Ceylon, ... ..	...	57.2	...	...
Bengal Presidency ... ..	(1826-32) 57'	63.	...	73.80
General Mortality in London, 1660-79—including two Plague years. ... .. 80.				
Windward and Leeward Command, ... ..	(1810-28) 113.	85.	...	...
Jamaica, ... ..	155.	143.	...	...
Bahamas, ... ..	...	200.	...	...
Sierra Leone, ... ..	...	483.	...	...

Although every figure in the above table carries with it a grave and terrible meaning, our regards are chiefly drawn to the lower numbers, indicating the rates of mortality which prevail among the troops stationed in several of our tropical colonies; and, as the eye dwells upon these records of almost incredible devastation, the question at once arises, —What steps were taken to secure the sanitary condition of the multitudes who thus perished, and of those who are daily

\* That is to say, the difference in the results arrived at evidently depend, not less upon the circumstance that most of the observations were made at different periods, than upon the fact of those periods being some of short, and some of long duration. Neither do the figures afford any very distinct illustration of the progressively increasing healthiness or insalubrity of the several stations;—for example, while the average deaths among European soldiers in the Madras Presidency is here stated to have been 38.460 per 1,000, during the 20 years ending in 1844, the mortality in that army appears not to have exceeded 19.710 per 1,000 in the last of those years.



falling away in like manner? Surely all these lengthy muster-rolls of death cannot have been the results of causes which were wholly non-preventible. Let us take a few instances in detail. Six years ago, the annual mortality among the English troops at Sierra Leone was in the proportion of *four hundred and eighty-three* out of every thousand men.\* The chances of the climate alone were sufficient to annihilate a fully appointed regiment every second year—each man dying,—as the sailors term it, “straight in his cot,”—suddenly, but without a wound; and, probably without a single note of service against his name, except that which the record of his premature decease afforded. We are told by Mead that the Pestilence of 1348-49 was the most destructive that has ravaged the world in modern times—as it swept away more than one-half of the inhabitants of every region of the earth which it visited.† It has been considered by many that Mead’s estimate was vastly too high—here, however, is a fact, almost of the present day, which tells with infinitely greater force:—upwards of forty-eight hundredths of a class dying—not in any single pestilential visitation,—but, year by year, as fresh supplies of men came in, the ordinary diseases of the climate were ever ready to claim their annual moiety of lives! And yet these soldiers were lodged in a handsome three-storied barrack, standing upon a considerable elevation, fully open to the sea-breezes, and with an apparently nearly equally well-constructed hospital close at hand, where they were daily attended by medical officers well acquainted with their profession, and especially conversant with the Hygienic management of troops.

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\* Major Tulloch’s statistics of the mortality among British Troops on the West African Station (published in the *Journal of the Statistical Society*, in 1840) are now, happily, only of historical importance. Among many other most striking details, it is here shewn that “double the original force of a garrison has been known to be cut off within twelve months.”—“At the three stations of the Gambia, Isle de Loss, and Sierra Leone, the sickness and mortality of the white troops, from the year 1819 to 1836, shewed that the mean strength was 1,843, the admission to hospital 5,489, and the deaths 890: and thus it appeared, that in the long average of 18 years, about one-half of the troops were cut off annually. In 1835 and 1836 nearly three-fourths of the white troops perished. It is but fair to state that the majority were of a class supposed to be the least fitted to endure the climate.” Out of 220 troops who arrived at the Gambia in May 1825, no less than 87 died before the 21st September; and, on the 31st December, there only remained 39. A reinforcement of 200 Europeans lost one-half of their number in less than three months.

The latest Parliamentary Return gives 24 Queen’s vessels as now employed on the W. Coast Africa with a complement of 2,305 men.

† *Discourse concerning Pestilential Contagion.*



It is probable, however, that the remedy for this great evil lay far beyond the reach of the military surgeons. Something may possibly have been done to improve the sanitary condition of the Town of Sierra Leone; its position renders it well adapted for thorough drainage, and all who have resided in the tropics must be aware that densely-crowded native huts, jungles of rank vegetation, waste morasses, and muddy pestilential creeks, are not altogether unmitigable evils. I cannot, however, discover, in either of several accounts of that colony which I have searched, the records of any regular system of this description. Happily, "The White Man's Grave" is now garrisoned by a local force, the Government have humanely determined that British troops shall not in future be exposed to its deadly atmosphere. Still, the place would probably well repay the exertions of an officer of health, providing one could be found long-lived enough to carry out the improvements which it requires.

The following details appear to have a larger proportion of good mingled with their evil than the last; still, it is to be feared that the good is far from being certain, while the evil is palpably real. We quote from a valuable article on "The Mortality of European Soldiers in India" recently published in the *Calcutta Review*. "From a return shewing the mortality at Hong-Kong and Tinghæ, we find that, at the latter place, there died, in less than six months, viz., from July 13th to December, 31st, 1840, no less than 433 men in three of H. M. regiments. The 18th regiment lost 52, the 26th regiment 238, and the 49th regiment 143. At this rate of mortality, an entire regiment would have been destroyed, as regards numbers, in a twelvemonth:—

			<i>per cent. In 1,000 men.</i>	
At Hong-Kong in 1842 there died			19	or 190
" 1843 "			22	" 220
" 1844 "			13½	" 135
" 1845 "			8½	" 85
" 1848 "			2½	" 25

Now, during the first three years, the troops were exposed to the malarious influence of the paddy-fields, and were very badly housed; in 1845 their accommodation and position were much improved; and, since that time, excellent barracks having been built, and great attention paid to drainage and ventilation, the sickness is not greater than that of a healthy station." Matters have not turned out so favorably at Hong-Kong as the writer of the above sketch would feign



believe. Nor is it easy to reconcile some of his figures with the following details.\*

In July, 1850, it was stated that sickness among the troops at Hong-Kong had been on the increase; as many as 160 men had been in the hospital at one time, and about 35 had died of fever. This happened when there was no unusual sickness among either the community or the Government police force. In 1848, the 95th regiment, from illness and the number in hospital, was declared unfit for duty, and about 100 were carried off in a short space of time. This sickness was attributed by some to the unhealthy position of the barracks, occasioned chiefly by the nature of the ground in the rear; by others it was thought to proceed rather from the crowded state of the rooms occupied by the men, and at night in particular, their beds being only six inches apart.† If reliance may be placed upon the unfavorable reports which continue to appear from time to time in the public prints, Hong-Kong must still be regarded as retaining its bad eminence among our unhealthiest stations.‡

For practical purposes, medical men cannot do better than endeavour to act upon the maxim that the whole of the causes of the various kinds of fever which commit such deadly ravages in tropical countries are essentially of a removable

\* *London Medical Gazette*, September 1850, p. 558.

† An English correspondent in the *Bombay Times* states that the fearful mortality which broke out late in 1849, among the European Troops stationed at Hong-Kong, which destroyed 130 men in a single Regiment, and which was attributed at the time to the insalubrity of Hong-Kong as a military station, was occasioned by the regiment having previously been poisoned on the voyage, by putrid preserved meat supplied by the Admiralty. Twenty-six of them died of cholera on board ship, on their way out, and they were obliged to stop at Rio Janeiro to purify the vessel. The writer enquires, if the climate alone was the cause of the mortality, how came the civilians to escape? Doubtless the accommodations of the generality of the civilians are, to a certain degree, preferable to those afforded by the "Victoria Barracks." Taking fully into account the poisonous effects of the "preserved" meats, it can scarcely be questioned that the mortality on shore resulted from endemial causes.

‡ "CHINA. The health of the Troops still continues to afford a most gratifying contrast to the mortality of last year; the total deaths since January, 1851, having been little more than occurred in a single month of 1850. In July, August, and September, last year, the most fatal months, the deaths were 92; this year, during the same period they have been 26—chiefly among the detachment which was landed from England at the commencement of the sickly season. The total deaths in the 50th, during the nine months of this year have been 30, all except two or three being new comers. Last year the regiment lost 48 in the month of August alone. In the Ceylon Rifles the mortality during the same periods of the two years has been precisely the same. In the Artillery, Engineers, and Gun-Lascars, it has been 9 to 7."—*Overland Mail*; September 28th, 1851.



character. Closely-packed blocks of small, filthy, and overcrowded native huts, huge accumulations of dirt and offal, polluted and stagnant reservoirs, vast marshes, jungly flats, and ill-defined river margins, are all conditions which are within the controlling power of active health officers and of able engineers. Still, in some of the deadliest stations the outlay of time and money which would be required before the physical condition of the neighbourhoods could be sufficiently changed, must stand as an insurmountable obstacle to efficient improvement. Of late, we have seen the total abandonment of our colonies strongly argued as a question of financial economy: it would, perhaps, be of more practical importance to enquire whether certain of our foreign stations should not be done away with, as a check to the excessive expenditure of human life. This question will, doubtless, hereafter be very seriously mooted with regard to the West Coast of Africa. There, the trade with the natives, although reported to be encreasing, has never amounted to any thing that can be regarded by the Home Government as of national importance;\* while it may be doubted whether our very partial success in checking the enormities of the slave trade† has not been purchased at too large an outlay of English lives.

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\* McCulloch, in his *Account of the British Empire*, states that on the West Coast of Africa, Sierra Leone, Gambia, Gold-Coast, &c., the exports are chiefly cotton goods, fire-arms, hardware, and salt; and the imports palm-oil, with some ivory, teak-wood, wax, hides, dye-woods, &c.: the former amounting to £132,000, and the latter to £90,900. A Parliamentary Return of 1840, gave the total Military, Civil, and Naval expenditure for Sierra Leone and Gambia alone as £38,347-9-0.

† About five years since, it was stated that, according to the calculations of the Anti-Slavery Society, the number of slaves in the world did not exceed from two to three millions, half a century ago, when the anti-slavery operations began, but that there are now considered to be from six to seven millions. There were then calculated to be one hundred thousand slaves annually ravished from Africa; there are now calculated to be four hundred thousand annually.—*Howitt*. Early in the present year, a return to the House of Commons was printed, showing the number of slaves embarked on the coast of Africa, and landed in Cuba and Brazil, in each year from 1842 to 1851. In Cuba the number landed in 1842 was 3,630; in 1843, 8,000; in 1844, 10,000; in 1845, 1,300; in 1846, 419; in 1847, 1,450; in 1848, 1,500; in 1849, 8,700; in 1850, 3,500; in 1851, 5,000. In Brazil, the number in 1842 was 17,435; in 1843, 19,095; 1844, 22,849; 1845, 19,453; 1846, 50,324; 1847, 56,172; 1848, 60,000; 1849, 54,000; 1850, 23,000; and in 1851, 3,287.

In May 1846, it was reported by the British and Foreign Anti-Slavery Society, that "during last year the number of slavers condemned by the Mixed Commission Courts at Sierra Leone was 36, having on board 6,000 slaves." [at this rate of yearly increase, it is not surprising that Sierra Leone should be pestilentially over-crowded.] "The stimulus to the trade was found in its immense profits. The traders did not hesitate to incur any risk or expense



The extra mortality of our troops is, however, not confined to tropical climates, or even to foreign stations alone. In 1848, the annual deaths among the Foot-Guards stationed in London amounted to 21.6 per 1000. Of these casualties, no less than 14.1 per thousand resulted from pulmonary consumption. In a case like this, making due allowance for the evils attendant upon a city station, it would certainly appear that the men suffered in an extraordinary degree from some removable causes of death; either in deficient ventilation of their wards, neglect of personal cleanliness—(a frequently overlooked, but grave cause of sickness among soldiers and sailors),—want of regular exercise, improper dieting, or undue exposure. Any unusual prevalence of Phthisis in a military station is an occurrence which should prompt as great activity in the employment of a preventive system, as though typhus or plague had suddenly made its appearance in the ranks. The subject is too extensive to be dealt with here:—we may merely state that, among other precautions, the enforcement of the most stringent rules against intoxication, the very careful and moderate treatment of all syphilitic cases, the discontinuance of night-guards, and, if possible, the removal of the troops to country quarters, or to healthy colonial stations, appear to be especially called for under these circumstances.

XXIII. *The Enforcement of a Well-Conducted System of Quarantine, whenever the Introduction of Pestilential Diseases is to be apprehended.*

An active spirit of opposition to every measure which appears to interfere with the requirements of free-trade, and

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to attain their object. The committee concluded that there was no reasonable hope that the evil could be overcome by an armed force, and urged that, henceforth, the energies both of the Government and the country should be directed to the universal extinction of slavery by means which were of a purely moral and pacific character." Mindful, however, of the Niger Expedition, the Government appear to retain but little faith in the influence of moral force upon the royal slave-merchants of the Western Coast. It is now stated that, since the fall of Lagos in December last, at the cost of 30 English killed and 65 wounded, "an immense number of the natives being killed,"—Commodore Bruce has entered into a treaty with every native chief in the Bight of Benin for the abolition of the slave-trade, protection of missionaries, &c. "The chiefs who, six months ago, would have killed any English officer who had the misfortune to be thrown into their power, now hail us as their best friends, swear the slave-trade shall never be renewed in their territories, and desire nothing but merchant ships for legal traffic." Converts, we are told, are generally enthusiasts—but it has very rarely happened that the strong conviction which the crash of artillery enforces, has ever afterwards gained force and extension under the mere nurturing of moral control.



a very general experience of the miseries attendant upon *pratique* in close and filthy lazarets, added to the confusion resulting from the irreconcilable disputes of the "red-hot contagionists," and the "ultra non-contagionists"—have gone far to render Quarantine the most hated and the most maligned of all beneficial public practices. If there be any fact fully established in medicine, it is the long-recognised, but much-assailed, principle that a well-managed system of *Isolation* is one of the surest preservatives that lies within the reach of man against the spread of pestilential disease.

The narrowness of the views which are even still entertained by several high medical authorities regarding the contagiousness or non-contagiousness of various fevers must be regarded as the greatest of the opprobria under which the science of practical medicine at present labours.

In a few more years, it will probably be received as an established fact that all the *Fevers*, including Cholera, the Remittents, Intermittents, and Dysentery, and even Hectic, are as essentially—though not as distinctly and as readily—communicable as the ordinary types of contagious and infectious disease—Plague, Typhus, Small Pox, and Scarlatina—are still universally admitted to be. A multitude of facts combine to shew that the sole difference between the "contagious" and the "non-contagious" fevers is that either the poison of the latter is far less concentrated than that of the former, or that its propagation is far more readily counteracted by extremes of temperature and by other external influences.

A few plain and well-established medical facts lie upon the threshold of the question of Quarantine.

A small and ill-cleansed vessel is over-crowded with passengers, the spontaneous developement of typhus of a deadly character is the almost certain consequence. Upon landing, the crew will communicate the self-same type of disease to the people on shore.\*

A man suffering from a description of fever which is generally regarded as "non-contagious" is taken on board a somewhat ill-cleansed vessel,—that very fever speedily begins to assume a highly contagious character, spreading among the crew, and being again communicated by them, in the form of an absolute pestilence, to the inhabitants of the port at which they land.† Knowing then that the noxious atmosphere of an over-crowded vessel is, in itself, capable of generating a pestilence, we need not be surprised that a

\* Emigrant Fever.

† Fever of the *Eclair*.



similar atmosphere should add a hundred-fold to the virulence of a febrile poison which is naturally of low intensity.

A careful observation of the progress of an epidemic fever will generally afford the best exposition of the difficult questions of contagion and non-contagion. In its passage across a country, it will make its appearance in a thoroughly salubrious district where the inhabitants are generally healthy, and the dwellings cleanly; here, the visitation will probably be light, and scarcely a fact will be observed which could lead to the conclusion that the disease was communicated from individual to individual. The scourge will pass on to a second spot, ill-situated, badly-built, neglected, and filthy; it will, almost to a certainty, first make its appearance in the dirtiest quarter of this filthy place; and, from this spot, it will radiate in every direction, displaying the most extraordinary virulence and assuming an unquestionably contagious character.

Let us, at this stage, select a single example of the fever;—the sick man is lying in a small and noisome room, almost entirely destitute of the means of ventilation. Nearly every individual, of whatever constitution, who enters that room is attacked with the fever in its severest form;—the disease is contagious here. During the height of his illness, the patient is removed to the airy ward of a well-constructed hospital,—he is there visited by three persons in thoroughly sound and robust health: one of these individuals sits close beside him—the others touch his hands—neither of them is attacked with fever—here the disease is neither infectious nor contagious. He is again visited by three other persons: one of these men is in weak health, a second is thoroughly depressed by the fear of catching the disease, the third has arrived heated and extremely exhausted. Two of them touch the sick man; the other stands nervously aloof. Each of these three men becomes the subject of fever—here the disease is contagious and infectious. This is no imaginary picture; it may be realised nearly every year by nearly every medical man in active practice.

Setting experience and science aside, it is undoubtedly *safe* to regard all fevers and all pestilential diseases as essentially communicable; and, while a single doubt or question remains upon the subject, it is, as certainly, unwise and dangerous to sacrifice precaution to convenience.

It cannot be denied that the Quarantine system, as carried on in the Mediterranean ports, has long been fraught with numerous evils and abuses of the gravest character;—the deten-



tion of passengers in vile Lazarettos, where pestilence is created—not prevented; the warning away of vessels believed to have pestilential disease on board, regardless of the danger thereby thrown upon the unfortunate crews; the detention of vessels upon false reports that fever was prevailing in the ports from which they had sailed; the unnecessarily protracted delay of passengers and goods; and, lastly, the employment of the system as a means of fraud and extortion—are all great and well-known drawbacks which, nevertheless, do not detract one iota from the necessity for a thoroughly well-organized and efficient system of Quarantine. It appeared to be a desire to construct a system of this kind which led the principal European Powers to send their delegates to the Sanitary Congress assembled at Paris in July, 1851. The experience of a year or two can alone shew how far our modern knowledge of Sanitary conservancy has aided the administration of the Quarantine system.\*

The popular opinion of the present day certainly tends to the view that Quarantine should at once be totally abandoned, absolute reliance being placed on other sanitary precautions. This is, substantially, the opinion of the Central Board of Health, who are engaged in the publication of a series of reports upon Cholera, Yellow-Fever, Plague, and other pestilential diseases. So far as the Board have hitherto carried their investigations, they have evidently advanced in the belief that epidemic and endemic fevers are not limitable by sanitary cordons, or by any system of Quarantine; still, there are not a few of our highest practical authorities who continue to entertain a strong faith in the protective value of isolation against the ravages of epidemic disease—Plague and Cholera more especially.† That a time

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\* The following statement, if correct, promises ill. M. Robinet submitted to the French Academy of Medicine a note from Constantinople, dated October 28th, 1851, stating that the Cholera, after having ravaged Bassora and the Persian frontier, had arrived at Bagdad where it was committing great ravages. The disease was expected to ascend the Tigris, and to enter Constantinople in the autumn or early in the winter of 1852-53. The Board of Health had decided that it "*would not adopt any quarantine regulations, but would merely direct its attention to hygienic precautions.*" Surely Hygeia was never before invoked in so mistaken a spirit!

† A "Treatise on the Plague, more especially on the Police Management of that Disease. Illustrated by the Plan of Operations successfully carried into effect in the late Plague of Corfu: with Hints on Quarantine: by DR. A. WHITE, Deputy Inspector-General of Military Hospitals, and late Superintendent of the Plague in Corfu:" 1846—is well deserving of attentive perusal, as demonstrating the possibility of restraining the progress of Plague by a strict system of judicious isolation: the opinions of Dr. Copland



may arrive at which every city and village of a civilized country will possess, in its thoroughly organized system of hygienic conservancy, an absolute safeguard against the attacks of epidemic pestilence—any sanitary reformer of a sanguine imagination is, of course, at liberty to believe; the error, so long as it is merely one of opinion, is certainly on the safe side; but that such immunity has not yet been secured in any one of our best regulated towns, the records of the late Cholera visitation abundantly testify. Let us work at the Herculean task as vigorously and as successfully as we can ever be expected to do, and we shall still find that, however susceptible of mitigation, recklessness and squalor, dirt and swamp, ozone and marsh miasma are as ineradicable by human exertions as Death itself. Had Sanitary Reform been established throughout Europe for upwards of a century, upon a scale proportionate to the views of our most enlightened improvers, it would be dangerous and unwise in the inhabitants to regard themselves as free from all danger of pestilential visitation, by virtue of their national cleanliness:—now, however,—when every habitable spot upon the face of the earth generates its own pestilences; when the northern cities of Europe can merely boast that the Oriental Plague has not visited them for nearly two centuries, and merely guess that a certain approach to town ventilation and cleansing has brought with it this immunity; when the Turkish Government have barely gained an insight into the meaning of the word *Hygiene*; while every Frenchman can still relate the history of the Rampart de la Tourette; and while our own Metropolis is still unvisited by the blessings of fresh air and pure water;—it is lamentable to find the Partingtons of Public Health applying the besom of destruction to the Lazaretto of Marseilles, and endeavouring to persuade themselves and the public that Cholera may be swept back from the reeking bazaars of Constantinople, and from the miserable hovels, of Bermondsey and Whitechapel, by the mere force of an almost incomprehensible firman, or of a “Health of Towns’ Bill,” half of whose leading clauses are still in abeyance.

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regarding the contagiousness of Epidemic Cholera, and the applicability of Quarantine to its restraint also demand serious consideration. The opposite view of the matter is very fully stated in the Parliamentary Reports on Quarantine for 1850 and 1852, and in the concluding pages of Chambers’s *Sanitary Economy*.



XXIV. *The Strict Prohibition of the Practice of Medicine and Surgery; and of the Sale and Compounding of Drugs by Unqualified Persons.*

A formidable and a deeply-rooted national evil is the medical and surgical quackery, intra-professional as well as anti-professional, which has been suffered to establish itself throughout the length and breadth of the United Kingdom. Equally destructive and disgraceful, whether it appears in the guise of Hydropathy, practised under the sanction of an Erlangen degree; of Hygeism, or Hollowayism carried on under the cloak of no degree whatever—beyond that with which every charlatan is necessarily furnished—an excessive degree of impudence and falsehood; of thorough-paced medical and surgical practice by wretches incapable of reading an ordinary prescription, or of comprehending it were it read to them; or of that busy spirit of mistaken humanity which leads nearly every third member of society to believe that he possesses an intuitive faculty of doctoring his neighbours, and of forming valid opinions in questions of the deepest therapeutic or pathological intricacy. In all other sciences and callings, a knowledge of his business is, of course, the main qualification which society requires of every man;—it is only in medicine, the most intricate and perilous, and the least exact of all sciences, that society at large appears to consider that the professor “*nascitur, non fit*”; agreeing with Henry VIII. in the belief, that there are “honest persons, as well men as women, whom God hath endued with the knowledge of the nature, kind, and operation, of certain herbs, roots and waters, and ministering of them to such as be pained with customable diseases.”\* With us, of the present day, the man who should take his chronometer for repair to the village smithy, or who should attempt to ride his horse across the Straits of Dover, would at once find himself surrounded by anxious friends determined upon trying the issue of a writ *de lunatico* upon his case; but, —wherever an elderly gentleman determines to believe that his constitution will be renewed, like Æson’s, by exchanging his blood for a vegetable extract under a daily course

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\* Act 14th and 15th Henrici Octavi, cap. viii, in which it is rendered “lawful for every person being the King’s subject, having knowledge or experience of the nature of herbs, roots, and waters.....to minister in and to any outward sore, uncome, wound, imposthumations, outward swellings, or disease, any herb or herbs, ointments, baths, poultices, and plasters, according to their cunning, experience, and knowledge, &c.”



of gamboge pills by the tea-spoonful ; or makes up his mind that the organically failing energies of his brain and heart will be restored by submitting himself to the "question by water" at Graefenberg or Boppard,—the severest comment that the wisest of his acquaintances will make upon his conduct will probably be—"he is too fond of quacking himself ; but, of course, he is the best judge in that matter." It is very evident, however, upon what causes these inconsistencies depend. There is scarcely one extra-professional person out of a thousand who possesses even the most superficial insight into the principles of medicine ; and, notwithstanding the prevalence of a fancy for dabbling in popular treatises on physiological and pathological subjects, there is, probably, not one man in ten thousand who can at all comprehend, or trace appreciatingly, the actions of the human body, either in health or in disease. Therefore, the generality of people will much rather hear from their quacks—

"Easy things to understand"—

than render their faith to the complicated mysteries of real medical science. Hence, a plain pseudo-medical theory of disease, such as—"Similia similibus curantur,"—therefore rely upon the homœopathic globules :—"All maladies have their origin in the blood"—therefore take none but the Hygeist's Purifying Vegetable Detergents ;—"Derangements of the Nervous System, which presides over every vital action, give rise to all descriptions of sickness"—as is proved by the marvellously restorative effects of the Nervine Corroborative Mixture.—"Bile, Bile, Bile, is at the root of all the evils that flesh is heir to"—therefore, take none but Coddle's Antibilious Pills.—"A Good Digestion is the true secret of long life"—therefore place your faith in the original Lignum Vitæ Pills as prepared by the Countess of Desmond who danced with Richard the Third and Charles the First."—Such doctrines and encouragements as these, stamped upon the Government labels ("without which none are genuine"), certainly go further to render a medicine popular, even with members of the educated classes, than could the most irrefragable testimony of high medical authority attached to the best medicine that has ever found its way from a pharmaceutical laboratory.

There is, however, something like method in this popular madness. In the getting up of a quack medicine there is generally a grain of truth mingled with the huge mass of imposture which is thrust upon the public. A patent medi-



cine is usually prepared upon a medical prescription of fair average value—the “Revivifying Regenerators” are, in reality, tonic pills;—the “Antidote to the Guillotine” is a tolerably useful healing ointment; and the “Vegetable Purifiers” would be useful aperients—if carefully prepared, and taken in moderation—only when required; three essentials for their success which, however, do not generally obtain. So also the generality of medical heresies are not altogether destitute of favorable points. Cold Water has many therapeutic uses; the Galvanic battery is as useful an adjuvant as the lancet; and neutralization may frequently succeed better than concentration in the compounding of physic. The extreme peril which attends the unlimited sale of patent medicines, and the cruelty of the fraud which lies in their puffing advertisements, are involved in the fact that, while these nostrums may prove rather useful than otherwise in a certain proportion of cases, there are numerous other instances in which their ill-advised employment inevitably leads to death—either directly, owing to their inappropriateness to the diseases in which they are employed under the delusion that their applicability is universal—or, indirectly, in consequence of their administration standing in the way of proper systematic treatment. There is, again, another reason why the fallacies of the quack—whether he be a mere specific-pill patentee or a full-blown practising charlatan—will always, in a great degree, countervail the truths with which the physician recommends his science. Racked with pain; passing away, without a hope, from the ties and enjoyments of life; all those whom he loves best and who are most dependent upon him standing around him in the agony of speechless despair; his reason and fortitude weakened by suffering and terror;—it is not singular that the sick man should turn away from the physician who merely offers him palliatives—confessing that cure is doubtful or impossible—and cling with vivid hope and gratitude to the quack who, with an air of absolute confidence and candour, unblushingly promises him speedy relief and many years of health to come. It must indeed be a high degree of sense and a strong resolution that will not prefer the “I will perform” of the pretender to the “I will endeavour” of the man of sterling knowledge.

If, however, the public have learned to believe that he is the best doctor who talks with the most confidence, drives the showiest horses, and lives in the largest house, the profession have mainly to blame themselves for the establishment of this popular delusion. There certainly never was a time at



which sound medical and surgical knowledge was so generally diffused among the professors of the healing art as is the case at present, throughout the United Kingdom. Whether in the capitals, or in the provinces, the difficulty would be—not to meet with a really efficient doctor, but to discover a regular practitioner who was not a man of considerable scientific attainment. Still, so long as our Colleges and Halls retain among their licensed members persons who live mainly by the sale of perfumery, ginger-beer, and patent medicines; and while they permit active believers in the juggleries of clairvoyance to deliver their annual orations, the public may be excused when they find it difficult to perceive that Dr. A \*\*\*\*, F.R.C.P., is a person of higher social caste than Dr. B \*\*\*\*, of the Faculty of Vienna and the American Academy—the eminent Chiropricist; or when they fail to distinguish that there is anything more “professional” about C \*\*\*\*, M.D.—the retail druggist from whom they purchase their monthly supply of Morrison’s pills—than there is about D \*\*\*\*, Parish Constable and Pork Butcher, who furnishes their Sunday’s joint, or that very genteel personage E \*\*\*\*, who cuts out their holiday clothes. Some of our leading professional bodies and Societies, headed by the Universities of Edinburgh and St. Andrews, have very justly entered upon the long-needed reform in determining that no professor of Homœopathy shall be suffered to practise under the cloak of their degrees or fellowships. It now remains for the English Colleges to maintain the principle that none of their members shall violate their oaths, and disgrace their order by the sale of secret remedies, or by adherence to any of the prevailing modes of medical deception and charlatanerie. There was a time—the time of Mead, and Garth, and Friend—when the style of “Doctor of Physic” certainly betokened the scholar and gentleman—a man who had received a thorough university education; who was absolutely and honorably tenacious of the credit of his order, and of the respect due to his scarlet gown and to his title,—now, unhappily—

“Defamed by every charlatan,  
And soiled with all ignoble use”—

and whose bearing in public and private entitled him to, and gained for him, an intimate footing in the highest classes of society. If any of these social and personal distinctions are now less certainly attendant upon our careers, we must attribute the falling off to our own remissness and laxity in not weeding our order more diligently.



It is the misfortune, not the fault, of our position that the candidate for an honorary medical appointment is compelled to solicit the favor of a vote from every grocer and publican in his district; it is no more disgraceful in the young and friendless surgeon to employ himself as a druggist until patients gather round him, than it was in the *émigré* French Marquis who sold tarts in Oxford Street with the cross of St. Louis at his buttonhole;—but it is shameful, alike to the individual and to his class, when the professional man sinks the gentleman in the shop-keeper, fawningly cultivates the favor of his inferiors by adopting their worst practices; vends the poisonous nostrums of unprincipled quacks, contrary to his own judgment, for the sake of a percentage on the sale; and with a view to his own small advancement, violates the rules by which the class who have admitted him are governed, and to which they have expected him formally to subscribe, for the maintenance of professional order and respectability. It must be again repeated that the medical profession might now, by the exercise of proper caution in the selection and sifting of its members, maintain a deservedly higher position than it has ever occupied since the time when Podalirius and Machaon, the sons of Æsculapius, were deemed worthy to be numbered among the rivals of Ulysses and Menelaus.

Without entering upon the apparently interminable controversies involved in the still absolutely undecided question of Medical Reform, we may be allowed to point out the leading steps which are demanded for the fulfilment of the great hygienic objects of rendering the public safe and satisfied in their medical advisers, and in the medicines furnished upon the prescriptions of those gentlemen.

At present the legal restraints upon quackery, and upon the practice of Medicine and Surgery by unqualified persons, are extremely lax throughout the whole of the United Kingdom. In England, for example, any person who so wills it may practice "surgery," and is also at liberty to write medical prescriptions, the latter proceeding being liable to restraint only within the Metropolitan jurisdiction of the College of Physicians. Throughout the country, the combined act of visiting, prescribing, and furnishing medicines, renders the unqualified practitioner subject to a fine for each offence; but as this fine can be inflicted only under a prosecution undertaken by the London Society of Apothecaries, at their own risk, the law has effect in exceedingly few instances; and, even then, less frequently in the cases



of quacks than in those of educated medical men who have encroached upon the apothecaries' province without possessing their license. Each of the licensing medical bodies has the power of expelling any of their members who may be found guilty of advertising secret or quack medicines, or of committing other grave offences in transgression of the fundamental laws of their order. Still, multitudes of uneducated quacks—male and female—herbalists, astrologers, farriers, druggists, bone-setters, worm-doctors, "practitioners of medicine," corn-cutters, cunning-women, advertisers of specific cures and of patent medicines, are found in active practice throughout the entire length and breadth of the country. The only remedy for this assuredly great evil appears to rest, at present, in the adoption of a police system of medical registration. Every medical man, upon settling in a town or district, should be expected to submit his diplomas to the nearest Justice of the Peace, who would register his name, qualifications, and place of residence, and furnish him with a license\* (to be renewed annually, or upon change of residence) to practise as a physician, surgeon, or apothecary in that place, subject to the rules of the locally governing medical bodies,—that is to say, it being of no material consequence whatever to the public where a medical man has procured his diploma, whether in Scotland, in America, in Italy, or in England, so long as he is *bonâ fide* an educated and passed physician or surgeon, the law of the country need not interfere with persons of this class;—they should, however, be subject to the rules of the licensing medical corporations—as of the Apothecaries' Society and the College of Physicians; and, on that account, lists of all registered practitioners should be periodically furnished to the licensing bodies, and the rule might even be carried to the extent of withdrawing the licenses from those whose names the said licensing bodies should strike out of the said lists as practising in defiance of their regulations as by law established. Every individual practising medicine or surgery without a license to be subject to fine or imprisonment upon citation before a Justice of the Peace. A system of this kind would go far to relieve the public and the profession from a very oppressive weight of irregular practice, and it would also be serviceable

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\* The price of these licenses need not be more than sufficient to maintain the moderate expense of registration, the drawing out of the periodical lists, &c.



in freeing the licensing bodies from those duties of supervision and prosecution to which their resources have not at any time been equal.

England is behind nearly all other countries in having no regulations whatever for the control of its Venders and Compounders of Drugs. The Druggists of England are, it is true, upon the whole, a highly respectable and well educated class, a large number of whom feel very strongly the laxity of the present system; still, any ploughman or grocer's apprentice is at liberty, with us, to establish himself as a "Chemist and Druggist" at whose establishment "Physicians' Prescriptions are Carefully Prepared"—subject only to his own will and to the laws for manslaughter.\* This, however, is not the case abroad. In France, every druggist has passed an examination, and is subject to severe

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\* Illustrations of the extreme importance of regulating the practice of druggists are of daily occurrence. Certain recent evasions of the Act regulating the Sale of Arsenic (see page 177) have been of a most flagrant character. One very striking instance of this kind has been sensibly noticed in the *Household Words*;—On the 27th November, 1851, William Rollinson, a man eighty years of age, was examined on the two-fold charge of poisoning one Ann Cowell and of attempting to poison his daughter-in-law Mary Rollinson. His attempts to poison were supposed to have commenced about the 17th August. The police "ascertained that the old man had been in the habit of purchasing arsenic in 'ha'porths' and 'pen'orths' at a druggist's shop in Great Thurlow. This important fact was proved by an aged and respectable looking man who described himself as an assistant and kind of manager at the shop. His answers to the examining Magistrate set the whole question of the ignorance of the late Sale of Arsenic Bill, or the contempt of it, in a very prominent light. Mr. Bevan, the Magistrate,—'When you sold him this ounce of arsenic (on the 21st or 22nd of August), did he state what he wanted it for?' Witness (somewhat coolly),—'No, really, I don't recollect; but it must have been something about the rats and mice.' [Taking it for granted that the common rule-of-thumb answer was made; but it did not much matter!] Mr. Bevan—'Then you have not the slightest recollection about what he said, excepting that he must have talked of rats and mice?' Witness—"No. I don't recollect what he said; it is very likely that it was about some mice: but I sold it him so often." Mr. Bevan—'Very often, perhaps?' Witness—'Yes, frequently.' Mr. Bevan—'How many times?' Witness—"I can scarcely recollect." Mr. Bevan—'More than twelve times, probably?' Witness—"Yes, it may be twelve times: so I can't recollect what was said every time." Mr. Bevan—"What were your instructions relative to the sale of arsenic; had you any from Mr. Daniels [the master of the shop]?" Witness—"No, none in particular. Merely to write the word 'poison' upon the paper."

About sixty of these pen'orths would sweep away the whole of the British Army. The extreme danger of allowing arsenic to be sold at all was shewn, at about the same time, in the case of a *bird stuffer* named Linkon, who stated that he had put poison on a piece of bread and butter to kill mice, and had eaten it himself by mistake. He said that the poison he had used was arsenic, "but only as much as would cover a six pence."—It however destroyed him.



penalties should he fail to keep those of his drugs which are poisonous strictly under lock and key, or should he sell any of them without authority from the police, and the warrant of a medical prescription. His books and drugs are also subject to periodical examination.

In Sweden, the Pharmacy Laws are remarkably strict:—the number of druggists' shops is limited; every dispenser and druggist is a person of good general and professional education, apprenticed and carefully trained and examined; he is not permitted either to practise medicine himself or to make up the prescriptions of irregular practitioners; his mode of preserving medicine and of dispensing is carefully regulated; and his shop and drugs are annually subjected to rigorous inspection.

Even in Turkey, an order was issued, in 1847, directing that no person should, in future, be permitted to establish himself as a dispenser of drugs until he should have gone through a proper course of study and possessed himself of a diploma.

Hitherto, the necessity for a reform of this kind has merely been discussed in England. Still, as in the time of the memorable Dispensary,—

“The shopman sells, and by destruction lives.”—

In 1841, a number of the leading members of the London Trade adopted the highly laudable step of establishing the Pharmaceutical Society who issue their diploma to druggists of known respectability and good education, and maintain a laboratory and lecture-room. It is to this Society (now incorporated by Royal Charter) that we are indebted for the proposal of the bill laid before Parliament by Mr. Hume, in which it was enjoined that druggists should be duly educated and licensed, and that they should not be permitted to prescribe—or, as it is commonly termed, to engage in “counter-practice.” This useful proposal, however, has not yet become law.

The prohibition of the sale of patent medicines is another highly desirable step; but one which, under present circumstances, can hardly be carried out: as, on the one hand, this practice brings into the Stamp-office a very important annual revenue, which would scarcely be renounced without a good deal of strong Parliamentary opposition; while, on the other, it is the will of the supreme public to be quacked, and their fiat cannot be gainsaid until good sense and fair education shall have made further progress among them. It appears



possible, however, to adopt a rule similar to the French ordinance, which subjects to arrest and imprisonment all who vend secret remedies, which have not been examined by five professors of medicine, commissioned for the purpose of ascertaining the composition and price of each compound, and the sale of which has not been authorised by the Academy of Medicine.\* The London College of Surgeons and the Society of Apothecaries are also imperatively bound, for the maintenance of their own honor, and for the sake of humanity, absolutely to prevent the sale of really "secret" and "quack" medicines by their Members and Licentiates.

XXV. *The Gradual Introduction of Regulations calculated to Improve the Morale of Populous Districts: and to Diffuse Religious and Useful Instruction among all Classes of the People.*

Theoretically and in practice, Popular Education has proved the knottiest subject with which the Thinkers and the Workers of this Age have essayed to deal—Whether the great mass of the people should be educated at all; whether the fullest opportunities of acquiring the highest standard of human knowledge should not be thrown freely open to every one; whether the education of the People should be mainly Religious, or merely Secular—or both combined; whether the National School Establishments should be rigidly conducted according to the principles of the Established Church; or whether real benefit to society at large may not be anticipated from affording enlightenment to individuals of all religious denominations; whether this School System or that is best adapted to the purposes of National Education; and—lastly—whether the public funds are capable of meeting the exigencies of the popular thirst for knowledge;—are all points which the Reviews and the Debating Societies, the Pamphleteers and the Luminaries of our Mechanics' Institutes, the Political Economists by Profession, and even the Leaders of the Great Deliberative Bodies of the Nation have discussed, declaimed upon, and fought over, until exhaustion, rather than advantage, on either side, has, at length, occasioned a pause during which the relief enjoyed by the on-lookers—in the conviction that all this tedious disputation and party cavilling will lead to

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\* We are indebted for this hint to a recent work on Paris by Sir F. Head, which contains many interesting and useful memoranda on the sanitary regulation of that capital, given in the author's best manner.



the establishment of wise and liberal measures hereafter—is the only immediate benefit obtained.

In discussing the present subject, it is not necessary that we should enter deeply into the Educational Question; it is merely our office to show that men would, unquestionably, be healthier and more useful than they now are, were they better trained, and better instructed.

It would be hard to tell where the evil succession first commenced; but, now, its order follows nearly thus,—*IGNORANCE, Idleness, Poverty, Intemperance, Irreligion, Vice, Slow Disease, Loss of Employment, Squalor, Abandonment of Self-Respect, Crime, Punishment, Destitution, Pestilence, Uncontrolled License, DEATH, Orphanage*; and then again,—*IGNORANCE*—and so, in all lands and in all ages, the train of destructive sequences has moved onwards in an unbroken cycle.

Considering our wealth and our advances in Arts, Sciences, and Philosophy, it is lamentable and disgraceful to our character, as a nation, that so many tens of thousands should live and perish amongst us in a condition of absolute ignorance and irreligion. We cannot doubt, however, that,—although it may be found neither indispensable nor practicable to diffuse a knowledge of æsthetics, logic, and metaphysics throughout those classes which, as long as the world endures, will produce hewers of wood and drawers of water,—the time is not far distant at which every reasoning being amongst us will be given full opportunities of having his mind sufficiently cultivated to enable him to view nature and his fellow men by the light of Christianity; to read the Word of God in his native tongue; and to listen understandingly to the truth that Peace, Justice, and Order, are the only ties which can avail to bind mankind together into societies.

Judging by the strength of the spirit of Self-Preservation in every member of the human race, it might, at first sight, be taken for granted that there could be nothing very insurmountable in the task of instructing quick-witted men in the art of guarding themselves against the operation of those moral and physical destructive influences which are now recognised as the chief of the Removable Causes of Disease and Death. Indeed, the experiment of enforcing such teaching upon communities has been largely, and not unsuccessfully carried out by the wisest law-givers from the earliest periods almost down to the present day. Every really great code of national faith will be found to embody



an invaluable system for the physical training of the race dictated to. The Levitical Code; the Laws of Solon\* and Lycurgus; the rules of the Koran, and the precepts of the Shastras—infinately unequal as their merits are—all display the most wonderful judgment in teaching men to live *long*, as well as religiously—each system of combined moral and physical regulation being adapted with admirable precision to the peculiar wants and circumstances of the several nations. And the results of the beneficial working of those great ordinances, throughout centuries of vicissitude and change, lie tangibly before us. There never were men who possessed at once all the grandest attributes of physical perfection, combined with the strongest capabilities for intellectual pre-eminence in a higher degree than the Jews who built the Temple and reared the Prophets; the Spartans who died at Thermopylæ, each upon a hecatomb of his own slaying; the Athenians who learned from Socrates and Demosthenes, measured minds with Pericles and Alcibiades, and gave the ideal of human beauty to Phidias and Praxitiles; the great Saracenic race who sprung up as the conquerors of the world at the invocation of Mohammed; or the few uncontaminated descendants of the ancient Brahmin pundits who may still be discovered in the sacred cities of Hindustan. For all these races temperance, cleanliness, exercise, the first principles of medicine, and the plainest rules of Hygiene were intimately bound up with their religious creeds;—and the finger of the historian will readily trace out the palpable influence of infractions of those laws in accelerating the national decadence of each. The curse has not yet departed from the descendants of those who eat of meat offered to Idols;—the stain of the Abomination of Desolation still clings to Zion and Moriah; Pestilence, squalor, and abject poverty foregather in every polluted quarter of Constantinople, Cairo and Damascus; Academia is a wild; the passage of two thousand years has swept away all traces of the Isthmian Stadium; and the people whose feet now press those memorable grounds are—modern Greeks. Finally, the original purity of their ancient laws has, for centuries, been unknown to the degenerate and degraded inhabitants of Bengal. With the acquisition of that enlightenment which has taught us to regard as sinful nothing which does not involve moral turpitude, we have, undoubtedly, lost certain religious “prejudices” and

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\* Or rather the social system of the Athenians, as reformed by Solon.



"superstitions" which were among the strongest holdfasts whereby the races who preceded us clung to life; and it is only now that we are beginning to search diligently for a system which may supply this vast and essential deficiency in our social organization. Something more than instruction in book-learning—something beyond the routine even of an ordinary religious education is required to enable men practically to carry out the principle of "Live and Let Live." Who can doubt this, when he remembers how the otherwise gentle and enlightened More summoned all the treachery and remorselessness of a bloodhound in his persecution of Tyndal—How holy Latimer watched Forrest's incrimination without a shudder or a tear?—

"Tantum Religio potuit suadere malorum"—

How, whether in the Court or on his ship's deck, the practical tendency of Rawleigh's inclinations was ever rather to Buccaneering than to severe philosophy:—and how the almost miraculous intellect which created the *Novum Organon* struggled through a long and exalted course unsustained by a single manly, honest, or generous sentiment? With these memories present to us, we may admit the principle,—

"Doctrina sed vim promovet insitam,  
Rectique cultus pectora roborant"—

but we find something shallow and deficient in the "*Ingenuas didicisse fideliter artes, &c.*" doctrine, and look for a system of education more humanizing than that which merely holds forth Reading, Writing, and the Catechism, as its first principles. In advancing this opinion, nothing is urged against either Learning or Religion;—it is merely submitted that the studies of Philosophy and Theology are not alone sufficient to endow mankind with the gifts of true humanity, and with the highest principles of self-preservation;—that, in short, we must not be satisfied with giving those whom we instruct a claim to the mere conventional titles of Christian and Scholar; but—whether to exceeding or in falling short of this standard, as circumstances will permit—we must never lose sight of the necessity of essaying to render them humane and reasoning beings. Still, in the fulfilment of this object, all the difficulty lies;—our wants are ever present to us—the means of supplying them are the sole desiderata of our lives. It would appear to be no impracticable matter to implant just so much sense and religious feeling in the minds of



Englishmen as would prevent the 70 instances of Murder;\* the 60 Sentences of Death;† and the 1,000‡ Suicides which, year by year, throw horror and disgrace upon our Society:—to introduce just sufficient education and coercion to restrain the annual arraignment of from 14 to 15,000 youths under seventeen years of age upon charges of Felony and other serious misdemeanors:—to convey as much practical knowledge of the distinction between right and wrong as would place a check upon the annual commitment to prison of upwards of 20,000 individuals convicted of grave offences,§ as burthens to the State, and as the subjects of an unusual rate of mortality:—to teach just as much morality and compassion as would save unnumbered thousands|| of friendless women from being cast yearly—

“ Under the feet of the trampling town”—

with the certainty of early physical destruction, and the almost inevitable probability of eternal moral death:—to inculcate that degree of manly self-dependence which would prompt the 150 or 200,000 able-bodied adults, who are registered as standing all the day idle,¶ to vigorous efforts for honest self-support; and to induce a similar anxiety in the breasts of a considerable proportion of the multitude of able-bodied individuals among the million and a half of paupers who continually depend upon parish relief in England alone.\*\* It would seem that no very elaborate system of education would be required to restrain these enormous

\* The annual average of *Commitments* for murder during the five years ending 1849, was 73. The whole of these numbers are for England and Wales only.

† The number of sentences to death during the ten years ending 1849, averaged 65 annually. In 1850, the number had fallen to 49.

‡ In 1839,—943; in 1840,—901.

§ Average of sentences during the five years ending 1849,—20,763 per annum. The number of *Commitments* in England alone in 1849, was 27,816; in 1850, it was 26,813. In the United Kingdom the commitments amounted to 74,162 during the year 1849;

|| The adduced statistics of this class are of very questionable accuracy. About ten years since, M. Fregier gave the number in Paris as 3,800. In 1796, the number in London was probably enormously over-rated by Colquhoun at 50,000. The number stated by the Constabulary Commissioners in 1838 (6,094) was probably nearer to the truth.

¶ The number of adults so described was, on January 1st, 1849,—201,644; in 1850,—170,502; in 1851,—154,525. *Edinburgh Review*.

\*\* In 1841, the total number of paupers in England was 1,109,529, of whom 285,090 were able-bodied. In 1848, the number of English paupers amounted to 1,626,201.

During the year ending the 29th September, 1851,—706,278 persons, in Ireland, received in-door relief; and 42,079, out-door relief.



errors in our social polity—no metaphysical or mathematical profundities, no refined logic, no transcendental philosophy, no abstruse theology:—all that appears needful is, to teach men practically to illustrate the rule—“Do Justice, Love Mercy, and Walk Humbly Before God.” To succeed in this, however, would be—to convert the world,—to change entirely the present moral and physical nature of mankind—in short—to expect from the Human Teacher a result which the miraculous interposition of the Deity could alone effect. Still, we know that the power has been mercifully granted to us to carry out this teaching partially, and to reduce those evils in a degree. Violence, Rapacity, Fraud, Brutal Ignorance, Vice in all its forms, Idleness, Poverty, can never be driven bodily from amongst us by our own exertions; and we must always expect to find them all in operation as causes of Disease and Death:—still, our Laws exercise a certain control over them, as strong medicines work upon violent maladies; and other agencies, apart from the coercion of the Law, have been brought into operation which act upon these moral evils as prophylactics and antidotes do in the prevention and arrest of many physical ills. In a mere outline, like the present, it would be impossible to do more than glance at a few of the principal means which are at present at work, or which it will be necessary to call into operation hereafter, in checking those moral evils which tend to occasion physical suffering and death in communities.

One of the most striking illustrations of this subject is found in the influence which a gradual change in opinions has exercised in diminishing the number and severity of Capital Punishments. During the thirty-eight years' reign of Henry VIII.,—when the population of England and Wales must have rather fallen short of than exceeded five millions—72,000 “great and petty thieves” were brought to the gallows. In like manner, Harrison states that, in the reign of Elizabeth, “rogues were trussed up apace;” and that there was not “one year, commonly, wherein 300 or 400 of them were not devoured and eaten up by the gallows in one place or another;”—and all this over and above the multitudes of “headings” and “bowellings” for treason; burnings for heresy; stonings in the pillory for perjury and libel; “gibbet-axeings” for thefts to the amount of thirteen pence half-penny and upwards; hunting by bloodhounds for larceny; boilings, rackings and pressing to death which, from generation to generation, were all insufficient to awe the lawless and irri-



table spirits of the age into a regard for the staid decorums of good citizenship.\* Towards the end of the first half of the nineteenth century, we find a yearly average of 56 sentences of death, a very large proportion of which are never carried into execution, regarded as sufficient to restrain the crime of murder among a population of twenty millions.†

Again, we find the gradual developement of two very simple principles—Humanity and Common Sense—removing the two direst judicial curses under which Europe has ever suffered—The Torture of Criminals, and the Laws against Witchcraft.‡

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\* It has been justly remarked that a system of this kind was not unnecessary in a country where, as Hallam expresses it,—“Highway Robbery was, from the earliest times, a sort of national crime.”—Sir John Fortescue maintained that more Englishmen were hanged for robbery in one year, than French in seven; and that “if an Englishman lies poor and sees another have riches which may be taken from him by might, he will not spare to do so.”

† During the latter part of the eighteenth century, the number of executions for murder, highway robbery, burglary, horse and sheep and linen stealing, forgery and other capital offences, was enormous. Townsend, the Bow Street officer states—“With respect to the present time and the early part of my time, such as 1781-2, 3, 4, 5, 6, and 7, where there is one person convicted now, I may say I am positively convinced there were five then; we never had an execution wherein we did not grace that unfortunate gibbet with ten, twelve, to thirteen, sixteen, and twenty:—and forty I once saw at twice.”—Mr. Porter shews, in his *Progress of the Nation*, that not more than 25 years ago, it was not at all uncommon to hang one hundred criminals in the course of twelve months. From 1805 to 1825 there were 1,614 executed: from 1825 to 1845—626. Of the latter 111, have been hanged in the last ten years; less than the number executed in 1813 alone. In 1840, the executions in England and Wales were 9; in 1841, 10; in 1842, 9; in 1846, 6; 1847, 8; 1848, 12; 1849, 15; 1850, 6; and in 1851, 10. It appears from tables recently given in the *Edinburgh Review* that the numbers sentenced to death in the several periods of five years ending 1839, 1844, and 1849 were respectively, 1,627; 368; and 282. These numbers, however, do not shew in favour of the influence which our present system exercises upon the crime of murder:—the instances of this crime, during the above three periods, having been 315, 347, and 365, shewing an increase of 15·8 per cent between the first period and the last.

‡ “Torture ceased in England in 1641, excepting the *peine forte et dure* with the preliminary binding together of the thumbs with whipcord until the strands broke, which was continued, in the cases of persons standing obstinately mute when arraigned for felony and piracy, until it was done away with by the statute 12 George iii, c. 20; but, even with the aid of that example, it was not abolished in Scotland till 1708, nor in France till 1789, nor in Bavaria and Wurtemberg till 1806, nor in the kingdom of Hanover till 1822, nor in the Grand Duchy of Baden till 1831!”—*Jardine*; and *Pictorial History of England*.

Between 1485 and 1749, an almost incredible number of persons suffered death as Witches in Germany upon the authority of a bull issued by Pope Innocent VII., directing the Inquisition to search out all cases of sorcery. Upon the first appearance of this edict, a hundred witches were burned in Piedmont, and the slaughter would have proceeded further, had not the



It has been computed that the number who suffered death for sorcery was 100,000 in Germany; upwards of 4,000 in Scotland; and 30,000 in England.

Another illustration, equally to the point, is found in the obvious influence which diametrically opposite kinds of national *morale* exercise in determining the proportionate number of *Suicides* in two countries standing, as nearly as possible, upon a par with each other in general enlightenment and civilization. There appears to be every reason to believe that, in proportion to the number of the population, the cases of suicide are, at least, twice as numerous in France as they are in England.\*

people taken arms against their spiritual persecutors. Five hundred more fell victims at Geneva. In 1559, a bill was brought into the English Parliament making enchantments and witchcrafts felony. Between 1580 and 1595 Remigius burnt nine hundred reputed witches in Lorraine. According to Ludovicus Paramo, the Inquisition burned thirty thousand reputed witches within the space of 150 years. Upwards of a hundred of such unfortunates fell victims to the drivelling pedantry of James I; and, in this reign, an Act (anno 1, cap. 12) was passed decreeing death to all persons dealing with evil or wicked spirits, or invoking them for the purpose of killing or laming, or for the discovery of any hidden thing, or for the provocation of unlawful love, &c. This horrible absurdity reached its highest virulence during the Protectorate, under the auspices of certain villains who were employed as professional witch-finders, of whom Mathew Hopkins was the chief. It is stated by Mr. Ady that, in Scotland, some thousands were burned in these times; and Dr. Grey alludes to having seen an account of between three and four thousand who suffered from the year 1640 to the Restoration. One wretch confessed, at his execution, that he had brought about the deaths of above two hundred and twenty women, in England and Scotland, for a reward of twenty shillings a piece! This was no mere popular delusion which the wisdom of Government could frown down at will. The otherwise enlightened Hall believed in witchcraft with all his heart; and, late in the sixteenth century, we find North, the Chief Justice and Chancellor, fearing to protest against sorcery lest men should exclaim—"This Judge hath no religion—he doth not believe in witches." This prepares us to learn from Cotton Mather that, at about the same time, nineteen witches were executed in New England; one of whom was a minister. Two witches were executed at Northampton in 1710 or 1711; and so late as 1716, when Swift, Gay, Pope, and Arbuthnot must have been considered to have brought the art of satirising folly to its highest perfection, a woman named Hicks, and her daughter aged nine years, were hanged at Huntingdon for a variety of enormities, among which selling their souls to the devil, making their neighbours vomit pins, and raising a storm in which a certain ship was almost lost, were the most considerable. It was not until 1736 that the Witch-Act was repealed, upon the occasion of an attempt being made to enforce it upon an unfortunate old woman in Surrey.—*Fairholt Barrington Granger. Wills.* The article on "Religious causes of Death," in Dr. Reid's *Philosophy of Death*, may be referred to for some additional interesting particulars on this subject.

\* According to the Registrar-General's Report, the total number of *Suicides* in England and Wales, during the year 1839 was 943; in 1840, it was 901. In France 2,142 persons committed suicide in 1843; and 2,200 in



A few centuries hence some moralizing historian may gain credit for the supposition that this greater prevalence of self-slaughter probably resulted from an absence of vivacity and a tendency to despondency which inherently characterised the French esprit.

Among all nations the crime of suicide has appeared to be prompted by certain prevailing and distinctive trains of opinion. The Jew and the Roman of old sought death upon their own swords—only when they knew that their last battle had been fought, and lost, and that, in a few more moments, the contamination of their victors' grasp would be upon them; the Scandinavian Kæmp was wont to seek a similar destruction, faithfully believing that his spirit could never find way to join the yearned-for strife of his Valhalla, except by the outlet of a mortal wound; in the modern Englishman's self-murder, superstition and fanaticism rarely, if ever, prompt the blow. The wretch is either mad, in the strict sense of the term, or his crimes or his misfortunes have hurried him to that point at which he can descry no hope for here or for hereafter. It is not so with the Frenchman;—a considerable portion of the *lex non scripta* of his faith rests in a conviction that his life, being his own, is at his own disposal;—fortified with this belief, he prepares to break into the bloody house of life with the same nonchalance which would attend him in entering a salon, or in working at a barricade. A fair proportion of practical Christianity appears to be the remedy which is demanded here.

Convinced of the absolute inefficiency of sanguinary penal enactments, and of mere money-giving in preventing the development of national crime, with its attendant train of deadly consequences, the philanthropists of the present day have determined to seek from *Education* the great desideratum of rendering mankind humanized and self-helpful.

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1844. Mr. Briere de Boismont stated, in 1848, that the number of suicides, in the department of the Seine alone, amounts annually to 600, without reckoning attempts, which are twice as numerous. Again, the Registrar-General has shewn that, during the summer quarters of five years (from 1847 to 1851) the numbers of suicides in London out of a population of two millions and a quarter were 65, 59, 48, 58, 48. The city of Paris, with its one million of inhabitants, [according to the census of 1849—945,721 intramuros, exclusive of strangers] is stated to have lost 9,000 lives from this cause in 34 years. The present annual average of suicides in Paris amounts to 300. Mr. Farr, however, calculated, from statistics adduced previously to 1838, that, in England, there was 1 suicide to every 340 deaths; while, in France, there was only 1 to every 472 deaths.



In their endeavours to work out this principle, they have, doubtless, occasionally fallen into weakness and error, in overlooking the real value of a just and moderate system of punishment, in exceedingly over-estimating the practical utility of book-knowledge, and in anticipating immediate and universal benefit from measures which must, at best, act but slowly; and which, in their utmost probable success, can prove little more than palliatives to a class of evils the cure of which has been placed beyond the grasp of humanity. Still, the systems which have been marked out, and several of which are at present working together for this good end, have so many features of usefulness, and bear so strongly upon the prevention of those causes of death which spring from crime, ignorance, and poverty, that they must not be allowed to pass without notice here.

Among the chief of our national wants stand the three desiderata of (1) Education for the children of the poor; (2) The institution of Refuges, and of means of honest support for the large class of unemployed and friendless Women; and (3) The practical diffusion of Religion throughout the community at large.

I. The hope at present so strongly entertained that Education may prove a panacea for some of our gravest national evils, is mainly based upon the fact that about four-tenths of the population of England and Wales are absolutely illiterate, and that only a very small percentage of our worst criminals possess the elements of a common education.\*

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\* It was found that 33 per cent. of the men, and 49 per cent. of the women who were married in the registered districts during the year ending June 30th, 1839, were unable to write their names. In the following year, the results were nearly similar. In 1846, the Rev. Whitworth Russell, Inspector of Prisons, adduced the following results from a most careful investigation among the prisoners in England and Wales. There were, on the annual mean of five years from 1839 to 1843,—

	<i>Assizes &amp; Sessions</i>	<i>Summary Conviction</i>
Of those who could neither read nor write, .. ..	9,530 or 34.9 p. ct.	26,924 or 38.1 p. ct.
Those who could read only, .. ..	6,329 „ 22.5	13,932 „ 20.6
Those who could read or write badly, .. ..	9,598 „ 33.3	22,278 „ 33.2
	<u>90.7 p. ct.</u>	<u>91.9 p. ct.</u>
Those who could read & write well, .. ..	2,627 „ 9 p. ct.	2,667 „ 4 p. ct.



There are three classes of young persons whose education should, almost of necessity, devolve upon the State. Foundlings, and absolutely friendless orphans, and the children of those who are too poor or too ignorant to afford their offspring a due amount of school teaching and industrial training:—the children of criminals and of professional beggars whose home education can only tend to render them dangerous members of society:—and, lastly, those children who have already begun to act in violation of the laws.

The following more recent statistics are from *Blackwood's Magazine*:—

Number of Criminals in England and Wales Unable to Read and Write, (Average annual number of Criminals. . . 27,542)				Number of Persons Married in England and Wales unable to Write their names. (Average annual number of persons married . . 261,340)			
1839	..	..	8,196	..	..	..	100,616
1840	..	..	9,058	..	..	..	104,335
1841	..	..	9,220	..	..	..	99,634
1842	..	..	10,128	..	..	..	94,996
1843	..	..	9,173	..	..	..	101,235
1844	..	..	7,901	..	..	..	107,985
1845	..	..	7,438	..	..	..	118,894
1846	..	..	7,698	..	..	..	117,633
1847	..	..	9,050	..	..	..	104,306
1848	..	..	9,691	..	..	..	105,937

These facts would appear to be sufficiently demonstrative of the justice of the opinion that popular education may be expected to bear a strong part in the diminution of crime and of its attendant evils. Still, this principle has met with very strenuous opposition. Thus, several years previous to the appearance of Mr. Russell's calculations, a table was given by Mr. Porter (*Progress of the Nation*, III. 201-32) in which it appeared that in the year 1841, no less than 29,738 of the criminals throughout the British Empire, were educated, while only 17,068 were uneducated. Of the former class, it was observed that 19,064 could read or write imperfectly; 8,438 were marked "well," and 168 "superior." A table has also been given shewing that, out of 2,541 persons committed for trial or bailed in the county of Lanark from 1836 to 1840—815 or 32·07 per cent. could neither read nor write; 1,338, or 52·65, could read or write imperfectly; 325 or 12·79 could read and write well; while 51, or 2·00, had received a superior education; the previous instruction of 12, or 0·47 per cent, could not be ascertained. (*Blackwood's Magazine*; November, 1841.) Here, however, we merely have an illustration of what too frequently occurs—the employment of nearly identical facts as the proofs of diametrically opposed views. Mr. Russell states that, of the prisoners tried at the Sessions and Assizes of *England and Wales*, only 9 per cent. could read and write; while of those summarily convicted no more than 4 per cent. had received even this amount of instruction. Mr. Porter's table merely shews that, during one of the years chosen for Mr. Russell's calculation, the proportion of those criminals, throughout the *British Empire*, who could read and write amounted to about 17 per cent.: while the calculation for Lanarkshire shews that between 14 and 15 per cent. of the offenders had received at least this amount of instruction. The fallacy of describing the very large proportion of criminals who could read, but could not write, as well as those who could "read and write imperfectly" as "educated" persons, is so glaring, that we cannot but feel surprised that it should have originated with practical men.



Hitherto our legislature has effected nothing towards the important task of taking under its own management the second of these classes. We must trust that, bearing in view the beneficial results of the Prussian law which renders the gratuitous education of children in a great measure compulsory, the English Government may be induced to afford a protection to the children and orphans, of all convicted criminals, a step which evidently involves the first essential in any educational system bearing upon the prevention of crime.\*

At present, the first two classes have opportunities of sharing in common the advantages which are by no means adequately afforded by a considerable variety of educational

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Again, we are told that, during the last forty years, while education has been more or less upon the advance amongst us, "serious crime" has increased over the whole empire *ten times* as fast as the number of the people. (*Blackwood's Magazine*; May, 1845 and March, 1851.) On the other hand, this statement has recently been met by tables which shew "that while the offences judged worthy of death and transportation for life have diminished since 1839, 18 per cent; and those judged worthy of shorter terms of exile have increased somewhat faster than the population—the vast increase which has taken place has been in those offences punishable by a year's imprisonment or even less. A comparison between the last five years and the five years immediately preceding shews a diminution in all offences except those visited by the mildest penalties." (It is, however, shewn by this writer that the number of murders committed during the five years ending 1849, was greater than during the preceding five years.—*Edinburgh Review*; April, 1851.) It is further argued, with much reason, that an increase in the number of committals is often only an indication of a better system of detection; and that an increase in a large proportion of the crimes of violence, and in most of the crimes of fraud, is attributable rather to increased activity in a distinct section of the community—the professional criminals—or to increased facility for their depredations, or, at most, to an increase in their numbers than to any augmented criminality on the part of society in general.

\* "When I was in Berlin, I went into the public prison, and visited every part of the establishment. At last I was introduced to a very large hall which was full of children, with their books and teachers, and having the appearance of a Prussian School-room. 'What!' said I 'is it possible that all these children are imprisoned here for crime?' 'Oh, no,' said my conductor, smiling at my simplicity, 'but if a parent is imprisoned for crime, and on that account his children are left destitute of the means of education, and are liable to grow up in ignorance and crime, the Government places them here, and maintains and educates them for useful employment.' This was a new idea to me. I know not that it has ever been suggested in the United States; but surely it is the duty of Government, as well as its highest interest, when a man is paying the penalties of his crime in a public prison, to see that his unoffending children are not left to suffer and to inherit their father's vices. Surely it would be better for the child, and cheaper as well as better for the state. Let it not be supposed that a man will go to prison for the sake of having his children taken care of; for those who go to prison, usually have little regard for their children. If they had, discipline like that of the Berlin prison would soon sicken them of such a bargain."—Professor Stowe—as cited in *Chambers's Journals*.



establishments, the principal of which are the ordinary Charity and Sunday Schools, to which have of late been added a considerable number of Infant Schools and some Industrial and Ragged schools.\*

It is considered probable that from a tenth to an eighth of the people of England and Wales are now receiving school instruction ; but that, nevertheless, there are from 800,000 to 1,000,000 young persons who are still unprovided with the means of elementary tuition.†

It has recently been calculated that we have a mass of, at least, 50,000 depraved and vicious lads, professionally living on the plunder and injury of society.‡ There were no less than 12,508 boys and girls punished for crime in England during the year 1849. A certain, but small proportion of our juvenile delinquents are submitted to industrial training in a few reformatory institutions, such as Parkhurst and the London Philanthropic Institution ;§ but the majority are temporarily imprisoned, with or without corporal punishment, and are then discharged upon the world, again to incur temptation and criminality ; and again, and again to burthen the nation with the expense of prosecuting and confining them, and with the disgrace of failing

\* It appears from a report of a Meeting of the Ragged School Union, in May, 1852, that there are at present, in London, 110 schools ; 1,650 voluntary teachers, 200 paid teachers, and 13,700 children. Schools on the same system have been established in all the large towns in the kingdom.

† *Chambers's Information for the People* ; Ed. of 1849. The last educational grant (1851) to normal and elementary schools was £142,229. It was a gratifying fact that, during the Session of 1851, the Prime Minister promised that, if he remained in office, he would attempt the establishment of a national system of education. Let us trust that his successors will hold to the pledge.

‡ From a highly interesting and valuable article "On Juvenile Delinquency" in the *Edinburgh Review* for October, 1851, which may be referred to with advantage as embodying the most recent data relative to this important subject.

§ The Reformatory system at Parkhurst is carried on upon a rather extensive scale. Elsewhere in Great Britain, the system can be regarded only as one of local benefit. According to Mr. Laing, about ten years since, the authorities reported that the Glasgow "House of Refuge" had "produced the most marked effect on the progress of juvenile depravity" in that town, and in a short time "had diminished the number of juvenile male thieves (to whom its operations are confined,) within the bounds of the Glasgow Police one half."

One of the earliest Reformatory Establishments in England is that at Redhill, near Reigate, which has been in operation 60 years, and annually sends out about 40 reformed youths as useful agriculturists and artisans. The London Philanthropic Society acts upon a very limited scale. It, at present, admits only 100 boys, but the committee have recently announced their intention of encreasing the number to 200. The best sources of in-



to reclaim them.\* The system which is considered to have acted best in the management of juvenile offenders, is that which has been in operation since 1839 at Met-

formation upon this question appear to be a recent work by MARY CARPENTER *On Reformatory Schools*, and a *Report of a Conference on the Subject of Preventive and Reformatory Schools*, held at Birmingham on the 9th and 10th December, 1851.

\* The following instances are taken from the London Police Reports of April, 1852. They are merely ordinary items of the evidence which is daily presenting itself of the necessity for reformatory establishments in which juvenile criminals may be rescued from destruction :—

“At Lambeth Police-office, Edward White, an urchin only ten years of age, was charged before the Hon. G. C. Norton, with stealing a penny biscuit from a little girl in the public street. The mother of the youthful delinquent, a decent-looking woman, who appeared overwhelmed with grief, informed the magistrate that for upwards of three years her son had been a most artful and confirmed thief. Every means had been resorted to by herself and her husband to cure him of his propensities, but it was all to no purpose; and the boy himself said that his disposition to thief was so strong, that he could not resist it. When punished, and even tied up for weeks together, he said it was of no use; that he was a regular Jack Sheppard, and should pursue the same course. Mr. Norton—‘Has he ever been in custody before?’ Mother—‘He has been frequently given into custody, but on account of his extreme youth, and my interfering on his behalf, the parties let him off. He has been brought home at all hours for being found on different premises, and has frequently carried away everything he could lay his hands on in my place.’ Mr. Norton (to the prisoner)—‘Well, what have you got to say to this extraordinary conduct of yours—this disposition of yours to thief—and carry away everything you can lay your hands on?’ Prisoner (coolly)—‘I wish I could leave it off, but I cannot.’ Mr. Norton—‘Indeed! and so you will be a Jack Sheppard?’ Prisoner—‘Yes, Sir.’ Mr. Norton—‘I must see and cure you of those propensities, and shall begin by seeing what ten days’ solitary imprisonment, and a sound whipping will do.’”

“At Clerkenwell Police-office, on Monday, an incorrigible young girl was brought before the Magistrate. Sophia Wensley, twelve years old, and pretty-looking, was charged with stealing a shilling from a little girl in the street. She was well ‘known’ to the police, having been in custody last week. The father, a respectable-looking man, a painter in Somers Town, was deeply affected; he said that the girl had received, both from himself and her mother, the best advice and instruction, but she had a natural propensity for bad habits and pilfering. They had sent her to school; but she would play truant, and stop away from home for weeks together; and she had robbed no fewer than fifty children within a short time. Although there was every comfort for her at home, she would wander about, sleeping on the steps of doors and in carts, and living on nothing but plunder. After she was discharged from this court on Thursday last, he locked her in an apartment, where he kept her without her shoes, but she contrived to escape, and he neither saw nor heard anything of her until he received information that she was locked up on the charge of robbery. He had five other children, who, he was afraid, might be contaminated by such a bad example; and he entreated Mr. Currie to do something with her, in order to save her from utter destruction if possible. Mr. Currie—‘The best thing I can do will be to send her to prison for a very long time, when she will be properly instructed and attended to; I shall commit her to prison, with hard labor, for three months; and at the expiration of that term her father can receive her back again.’ The prisoner listened to the whole of the proceedings in a hardened manner, whilst her parents left the Court in tears.”



tray in France. At this, and at forty-one other reformatory establishments, nearly three thousand children are now undergoing a course of correctional education. Here, while the juvenile culprit is separated, during a long series of years, from all influences which could tend to confirm his early tendency to criminal practices, he is constantly subjected to a judicious course of moral training, combined with active manual occupation. It has been clearly argued that, far from being likely to increase the national expenses, or from proving an inducement to crime, a reformatory system of this kind might be conducted at an expense decidedly less than that which is involved by the present inefficacious plan.\*

II. The last census shewed that the number of females in Great Britain was 10,734,844—to 10,184,687 males. The experience of nearly every one will testify that scarcely more than twenty per cent. of these females occupy, in adult age, an independent position; that is to say, possess the power of maintaining themselves by their own means or by their own lawful industry.† This state of things is, of course, natural and proper enough in small communities, where the numbers of the sexes are nearly equally balanced, and where the successful labours of the stronger sex suffice to supply the necessities of the weaker; but it constitutes a very formidable condition in an over-populated country, where work is not always ready to the hands even of willing men, and where the sphere of active exertion for females has become limited to the utmost degree. With very few exceptions indeed, the English-woman who is destitute of the aid of friends, has no means of self-support beyond those which are afforded by the constant plying of the needle, by household servitude, or by factory labour—the worst required, the least intellec-

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\* As shewn by the calculations of Messrs. Osborne and Rushton. The Committee of Statistics of the Scientific Congress of Milan, in 1844, declared that there were then, in Italy, 114 houses of refuge for poor children, where 13,600 children were nourished and educated at an expense of 470,000 francs collected from voluntary contributions. The Papal States were not included in this account.

† In 1841, it was calculated that out of the 3,812,651 women between 15 and 45 years of age then living in England and Wales, there were probably about 2,000,000 unmarried. The census of that year gave a total of 9,582,308 females in Great Britain; of these 7,286,883 were registered as having no occupation; 86,035, as Almspeople, Pensioners, Paupers, and Beggars; 20,642, as living in barns, tents, &c.; 373,633 as of Independent Means; and 1,815,115 as following stated occupations. Of these last, 1,170,915 were registered as following the trying and precarious occupations of—Domestic Servants (908,470); Milliners, Seamstresses and others similarly employed (177,644); Factory Workers and Weavers (46,977); Nurses and Charwomen (32,533); and Workers in Mines (5,290).



tual of all employments—the least sustained by pleasure or by hope—the most exposed to temptations which lead to moral destruction and to physical death. Doubtless, every nation should strive earnestly to give aid to its helpless daughters in all their just endeavours for self-support, and to reclaim those whose weakness has borne them down in the painful and difficult trial of existence:—the due maintenance of England's eleven million daughters is, however, one of the most difficult questions with which that embarrassed country at present has to cope. For a long period this difficulty was merely cogitated upon;—of late years, a few steps have been taken to relieve it—in the form of encouragement to female emigration, and one or two attempts to organize societies for the employment and protection of distressed needlewomen, &c.—but it still remains a task worthy of the philanthropy and intellect of a Howard to discover fitting means of support for a very large proportion of our country-women. Certain it is that no civilised nation in the world affords so unfairly small a proportion of remunerative employment to women as England does; and that the country suffers not less in its financial than in its moral welfare from its unjust practice of giving all its best employments to its sons, and reserving all its worst and meanest offices for its daughters.\*

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\* The great towns of France and most other continental cities present a strong contrast to our own Metropolis in this respect. In the former instances, it may be questioned whether the employment of women in various kinds of handiwork has, in reality, enhanced the national morale, still it is evidently not the system itself which is to blame. It was recently stated that between 8 and 10,000 women find employment as clerks in stores in the city of Philadelphia alone. The occupation of an office clerk is, perhaps, not altogether that which a wise father would select for his daughter; but it is, of course, several grades above that of a sempstress or a factory worker.

Here is a little hint from Miss Catherine Beecher, a sensible American authoress, which is well deserving of practical attention in England and elsewhere—"The training of the human mind in the years of infancy and childhood, this, it is claimed, is the appropriate and highest vocation of woman. And in all those states and cities in our country where education prospers the most, it has flourished just exactly in proportion to the extent in which men have forsaken, and women have been restored to, this employ. There are now more than *two million* children in this country *without any schools!* There are probably as many more in schools taught by men who could be far more properly employed in shops or mills, or other masculine pursuits. Were all these children placed in schools at the ordinary rate of apportionment of pupils to teachers, it would require 200,000 women to meet the demand. Where are those women? They are living in indolent ease, or they are toiling in shops and mills, or in some other employments, which yield a pittance scarcely sufficient to sustain life."

The number of young females (chiefly sempstresses) sent out by the "Female Emigration Fund" now amounts to 850 or 900. The twenty-fourth



If it be difficult to provide for the good and the industrious—what shall be done for the “vicious, and the idle”?—First, it may be right to enquire in how many tens of thousands within our great cities “vice” is, in the main, but an incapable submission to a course of evil which has become practically inevitable; while “idleness” is a helpless abandonment of all hope of ever re-entering the sphere of honest exertion—a state that would fain drag itself to the feet of the righteous, and crave for the meanest labour with showers of bitter tears—did it not know of a surety that the iron door of human compassion would never be unclosed for it, and that, as regards the charity of this world, repentance and pleading would be idleness indeed?

A great deal has not, hitherto, been effected, or even attempted, towards the material diminution of vice in our great cities. It is true that London has its “Society for the Suppression of Vice,” and that Paris has a most successful system of police surveillance which has enhanced the health, if it has failed to improve the morals, of the “vicious and the idle;” but the spirit of the Gospel and the control of the Law are alike needed here. And what is one “Magdalen Asylum” to all the weak, fainting and regretful, if not repentant, sinners who daily traverse London with a vision of the muddy river waters and of the hospital dead-house ever present in their minds?\*

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party, numbering about 50, left England at the end of last June. The desirable objects of this charitable undertaking will, doubtless, be much extended, hereafter, by the exertions of those active philanthropists, Mrs. Chisholm and Mr. Sydney Herbert.

The last report of the “London Female Servants Home” stated that, of 100,000 servants in the Metropolis, one-tenth are always out of employ. The usefulness of the Home was shewn by the fact that 4,200 inmates had been received; and that of 23,200 persons placed on the registry, the greater number had obtained situations. The income of the past year had been £374. 6s. 5d. and the expenditure £363. 9s. 3d.

The “Industrial Home for Gentlewomen” has been instituted about two years, and has, at present, about 60 ladies under its care. The expenses are met by a small weekly payment on the part of the inmates, and leave only the expenses of rent, taxes and wages to be defrayed by public contribution. Upwards of 1,000 ladies have now received aid from the “London Governesses’ Benevolent Institution;” and nearly 5,000 have been provided with situations. The “British Benevolent Institution” is at present capable of extending its support to about 13 poor gentlewomen. Limited as the benefits derived from these and other like institutions confessedly are, it is gratifying to observe in their establishment and extension, the recognition of a formidable social embarrassment, and the expression of a practical anxiety to strive for its relief.

\* There is certainly much that is admirable in the French system. Whatever its defects may be, it affords a striking example of the good which may



III. The means of successfully diffusing religious instruction among the community at large cannot fittingly be discussed here. That some change and improvement in the moral condition of our countrymen is required, before they can obtain the privilege of living long in the land, must, however, be manifest not less to every physician than to

be effected by a wise and just absolutism. The following sketch has recently been given by Sir F. Head :—

“No house of bad conduct is allowed, as in England, of its own accord to fester up and break out wherever it likes ; but such evils, which it is deemed advisable not altogether to prevent, are licensed to exist in certain localities, and are forbidden from others, especially from the vicinity of any school, public institution, or church. From the instant they are established, the exterior and interior are placed under the constant and especial surveillance of a particular department of the Police, the regulations of which appear to have no other object than despotically to reduce to the minimum the list of evils consequent upon that which, if not implanted, has deliberately been allowed to take root. For instance, each mistress of a house of this description is obliged, within twenty-four hours, to bring with her to be enregistered at the prefecture of police every female who may be desirous to live with her. On her arrival there, the delinquent is seriously admonished to relinquish her intention ; and to induce, or rather terrify and disgust her, she is informed in detail of the surveillance to which she will be subjected. If the candidate be very young, instead of this course, she is, in the first instance, carried from the brink of ruin to the hospital of St. Lazare, where work is given to her, and endeavours are made to reclaim her. If from the country, a letter is addressed by the police to her parents or nearest relatives, informing them of her position, and urging them to save her. If no answer be received, and if her friends cannot be found out, a letter is written to the mayor of her commune, requesting him to do so. If her friends decline to come forward, or if it be ascertained that she is friendless, a last effort is made in the hospital of St. Lazare to reclaim her, and if *that* proves to be vain, her name is then irrevocably inscribed ; and, destitute of character and liberty, she passes the remainder of her life under the dreadful appellation of ‘*un fille inscrite*.’ Not only is every change of her domicile recorded in the books of police, but on the ticket she is obliged to bear,—and which at any hour and by any person she may be required to produce,—there must be inscribed the results of the weekly professional visits to which she is subjected.” Further, the conduct of this class in public is regulated with strict regard to order.

It is very striking to contrast this energetic limitation of a national evil, by the vigorous control of an active Government, with the necessarily slow and embarrassed results of private charity in our own country. Thus, at the last anniversary meeting of the “Liverpool Female Penitentiary” it was stated that 41 years had elapsed since, roused by the enormous extension of prostitution in that town, some benevolent persons had founded the institution for the succour and relief of the penitent. During those forty-one years, 1,576 unhappy women had passed through the institution, receiving, in a greater or less degree in proportion to their own sincerity and earnestness, the advantages which it was calculated to confer. 535 females, once the outcasts and scourges of the community, had been enabled, on leaving the institution, to pursue a course of industry and virtue, whilst many had been restored to the home of their early days, and to the arms and hearts of their parents. The institution is merely in part self-supporting. The applicants for admission in the course of the year were 116,



every divine; and it is consolatory to know that an active Christianising spirit is extensively at work.\* Of late years many "Visiting Societies," "Town Missions," "Domestic Missions," associations of "Scripture Readers," and other more or less useful institutions have sprung up for the religious instruction of our poor; and churches and ministers are daily encreasing amongst us;—still, it is a marvellous fact,—a fact which assuredly demands deep thought and careful sifting,—that, in the great centre of Protestantism, in the very focus whence emanate four-fifths of the missionary enterprise which, with indomitable energy, forces its way into every corner of the heathen world, in the very city which annually supplies nearly five hundred and sixty thousand pounds for the holy purpose of diffusing God's Word through every nation—there die yearly myriads of the least instructed, and the least religious wretches that ever lived and sinned, and sinned to live on the face of this earth!

The necessity for active charity, as a remedy for all the national and social evils alluded to above, is obvious enough, the means of supplying, and the manner of carrying out that charity are more occult. It is, of course, difficult in the extreme to steer between that indiscriminate bounty and aid, the effect of which would be to destroy the self-relying and self-helpful spirit of the poor—and that stern indifference which leaves large classes in a community utterly unsustained in their struggle for existence. It is a principle as universal, and as apparent in nations as it is in families, that scarcely any human being can exist in a state of ab-

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of whom 52 were refused. There had been restored to their friends 8, and the whole number which had left was 69, leaving 53 in the house.

Here is a fair average example of the respectable, but unsatisfactory and insufficient character of English benevolence. Here is the remedy—what is the extent of the evil which called it into operation? In 1836, a Committee of the Corporation reported that the number of unfortunate women in Liverpool amounted to 15,300. [as stated in Laing's Prize Essay. This may have been an over-estimate. The number (2,404) given in the Parliamentary Tables of Population for 1841 appears to be too low.] Since that time, at least one-third has been added to the population of Liverpool.

According to Mr. S. Low there are in the Metropolis 18 institutions, for "Reclaiming the Fallen, and staying the progress of Crime,"—supported by a total annual revenue of £35,036: but still,—“what are these among so many?”

\* One of the most interesting features on the parliamentary transactions of the session of 1851 was the passing, without a division, of the Marquis of Blandford's motion for an Address to the Queen, praying that the spiritual destitution of England and Wales might be considered, with a view to the religious wants of the people being supplied.



solute independence. No man, be he rich or poor, can track out his full pilgrimage from the cradle to the grave without depending upon the almost constant aid of others. In every country there are large bodies, almost classes, of individuals who would be absolutely friendless and helpless unless succoured by the charity of their wealthier brethren, or by the beneficence of the State. Among these are the Orphans of the Poor, the Foundlings, and a large proportion of the Blind, the Maimed and the Sick—and, even beyond these, those vast numbers of children whose nearest by blood relationship are their direst foes; who, with every scanty portion of food that is doled out to them, imbibe some principle of evil which must tend, hereafter, to render them active criminals insufferably burthensome and expensive to the public;—and, still again, the charity of a nation is demanded most exigently for the man or the woman of education and refinement irretrievably cast down, by dishonour or poverty, from a high or moderate estate—originally fitted for useful exertion only within a certain narrow sphere—and now hopelessly excluded from that by old age, failing health, or the not undeserved ostracism of society. Lastly, it is the State that should listen with mercy and charity to the cries for aid of those against whom virtuous society has turned away her head and closed her ears. The tender reclamation and the religious guiding of these outcasts is a task well worthy of a great and compassionate Government. Hatred to the sin may well be combined with mercy towards the sinner;—we must not forget that there are thousands of the self-righteous of this and of past ages who will see Mary of Bethany clinging, repentant, chastened and approved, to the mercy seat, while the sentence of their own condemnation is being thundered forth.

It is not intended by these arguments to question or to undervalue the utility of private charity,—we would merely endeavour to enforce the necessity of placing all great systems for the improvement of the mental and physical condition of the poorer classes immediately under the regulating authority of Government. The chief drawback to the self-aiding exertions of the English poor unquestionably arises from an utter want of centralizing power. The labourer who desires to lay by, in a time of plenty, against a season of want; who is anxious to insure his life; to provide for old age or for sickness, or for burial expenses, looks around him and finds the means of doing so offered to him—only in the tap room of the nearest Gin Palace, where



the committee of the "Labourer's Mutual Benefit Society" meets weekly, under the respectable auspices of Elms the Undertaker, and Mine Host of the Garter. It will be, indeed, a fortunate time for industrial England when institutions of this kind are formed throughout the country, upon a system as safe and as legal as that which at present regulates the Government Savings Banks. A deep conviction of this principle has suggested the strong anxiety, which must have been traced throughout the foregoing pages, that each of the various measures under discussion should be conducted, not at the cost, but under the authority of Government. There is scarcely any great social or national improvement that is not proposed and abandoned again and again, almost for generations, before it comes to be finally established. The world is full of schemers, and the world has learned to view all schemes, which are not propounded and backed by indisputable authority, with a great deal of steady suspicion. Hundreds of really useful improvements have been waved aside by the sentence—the plan is good, but we distrust the men

"Non tali auxilio, nec defensoribus istis  
Tempus eget."—

The great and leading value of Government measures is that they are, as far as possible, practically free from this objection.

It is trusted that enough has now been said to prove that, mortal and transitory as the condition of man inevitably is, he has been endowed with a power of lengthening, as well as of improving his earthly existence:—that this remarkable power has hitherto been cast aside with a strange and wilful carelessness;—and that the means by which it may be exercised, although but very imperfectly developed at present, are beginning to assume the form of a great and beautiful science. Let all who possess the benefits of intellect and education—the Divine in his study, and in the House of Prayer,\* the General in his camp, the Legislator and the Magistrate in their constant ordering of the people, and the Physician in his daily conversance with scenes of every kind, and intercourse with men of every class—let each,

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\* As an admirable example of the manner in which this mode of teaching may be carried out, see "A sermon on the Approach of the Cholera, by the REV. GEORGE CROLY, L.L.D." Kendrick : London ; 1848.



to the fullest measure of his ability, join earnestly in the development of this inestimable science—

——— “Still educing good,  
And better still, and better thence again,  
In infinite progression ;”

and we may venture to predict that the end of this century will find the civilized nations of the World twice as happy—nay, it may be, twice as virtuous—as they were at the opening of its sixth decade.

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## APPENDIX.

THE foregoing details may possibly be considered as materially deficient in the absence of any distinct outline of a working system of Medical Police. Such a system, however, can always be readily drawn out, where a full knowledge of the leading principles of Public Hygiene, and an intimate acquaintance with the sanitary requirements of the locality, climate, and people legislated for, are brought to bear upon the task. In undertaking such a duty, useful aid may be obtained by reference to the schedule of the *English Health of Towns' Bill of 1848*: the *Report of a General Plan for the Promotion of Public and Personal Health by the Commissioners appointed by the Legislature of Massachusetts; Presented in April, 1850*: and the *Calcutta Municipal Conservancy Act of 1851*.

Since the last chapter of this volume went to press, the author has become acquainted with two important works which he had previously been unable to obtain; viz. MARX AND WILLIS *on the Decrease of Disease, Effected by the Progress of Civilization*; 1844: and DR. JOHN REID'S *Philosophy of Death; or a General Medical and Statistical Treatise on the Nature and Causes of Human Mortality*; 1841. The perusal of these volumes will prove highly interesting to all who are engaged in the advancement of Sanitary Reform. The former is an eloquent and learned exposition of the causes which have hitherto tended to limit the severity and prevalence of Disease and Death; comprising some, but scarcely sufficient, allusion to the circumstances under which other causes of mortality have been brought into active operation; the latter is an able popular treatise replete with valuable statistical data.

### *Additional Evidences of a Decreased Rate of General Mortality.*

The mortality in England appears, from Dr. Hawkins' *Medical Statistics* (London 1829), to have been 1: 40 in 1780, and 1: 58 in 1821. It had, therefore, become about one-third smaller in the course of forty years. In the year 1697, the number of deaths in London amounted to 21,000; a century later, in 1797, despite the vast increase of population, it was but 17,100.\*

This highly important subject has been ably discussed, in its bearings upon English mortality, in an essay published by Mr. W. R. Greg, in 1842.† That gentleman gives the following illustrative table:—

#### RATE OF MORTALITY IN

<i>England.</i>	<i>France.</i>	<i>Sweden.</i>
1740 .. .. 1 in 35	1781 .. 1 in 29	1755-1775 .. 1 in 35
1770 .. .. „ 41	1800 .. „ 30	1775-1795 .. „ 37
1790 .. .. „ 45	1817 .. „ 39	1823 .. .. „ 48
1796-1800 .. „ 48	1824 .. „ 41	
1806-1810 .. „ 49		
1816-1820 .. „ 55		

\* As cited by Marx and Willis.

† *Remarks on the Changes in the Rate of Mortality in England;—Facts and Figures, No. VI.*



Mr. Greg shows that, up to the year 1820, there was a steady *diminution* of the mortality. In that year, the registered deaths were, to the population in *England*, as 1 in 58½, and in *England and Wales*, as 1 in 57. In the five years ending 1830, the average for *England* was 1 in 51, and for *England and Wales*, 1 in 52. In the two years 1839 and 1840, the two averages were 1 in 45·52; and 1 in 45·56. Making allowance with much analytical caution for the known inaccuracies in the data upon which the earlier of these calculations are grounded, Mr. Greg deduces:—

- I. That, up to the year 1820, mortality in *England* was diminishing, or in other words, the value of human life was improving at the rate of about 14 per cent. in twenty years or 7 per cent. per annum.
- II. That, since that period (up to 1840) mortality has been increasing at the rate *certainly* of more than 10 per cent. and probably of 12½ per cent. or 6 per cent. yearly.
- III. That, from 1839 to 1840, mortality increased at the rate of 4·3 per cent. yearly.

A table quoted by Mr. Chadwick,\* from Mr. Edward Mallett, shews the progressive increase in the value of human life in the city of Geneva, as deduced from the municipal registers:—

	Years.	Months.	Days.	Proportionate rate of Increase as compared with the end of the sixteenth century.
Towards the end of the 16th century, the probabilities of life were, to every individual born. . . . .	8	7	26	100
In the seventeenth century.	13	3	16	153, or 53 per cent.
1701 .. 1750 ..	27	9	13	321, or 221 "
1751 .. 1800 ..	31	3	5	361, or 261 "
1801 .. 1813 ..	40	8	0	470, or 370 "
1814 .. 1833 ..	45	0	29	421, or 421 "

#### *Moral Effects of Pestilential Visitations.*

The following spirited details† convey a stern lesson, in coincidence with similar records of unbounded popular license in the Pestilence at Florence in 1348, as described by Boccaccio, and during the Great Plague of 1665, as given by Pepys and De Foe:—

"What a strange Paris that was! The Cholera had absorbed every thing—politics, sedition, theatres, intrigues, morals, doctrines—it was itself society—the object of all thoughts, the centre of all actions. Poor Paris! And how hideous it was, when the social mud and filth, stirred up from its depths, mounted to the surface, and there frothed and fermented, and threatened to join its waves to those of party ambition, and filled the town with the most monstrous clamours that can be imagined. You recollect what then was the aspect of this capital of pleasure and enlightenment; no resignation to the evil, no prudence in the

\* *Sanitary Report.*

† From "*Etudes sur les Hommes et les Mœurs au Dix-neuvième Siècle*;" by M. CHASLES. As quoted in the *Westminster Review*.



lowest class, of all others the most exposed ; sacrifices disregarded, generous assistance repaid with calumny and ingratitude. The moral malady under which the nation was suffering was still more pitiable than the physical. The heart was grieved, not so much by the spectacle of trade paralysed, theatres closed or empty, coffins borne in the arms for want of horses and carriages, women in mourning, the town abandoned by 30,000 foreigners in eight days, the chambers deserted, all works suspended—as by that of the ignorant and deluded mob in the streets uttering cries of rage and murder, stopping a hearse with blasphemies, intoxicated with fury, terror, vengeance, hunger, and despair ; rebellious to science, inaccessible to persuasion, incapable of necessary abstinence or of self-control. Who that has seen these bacchanalia of blood and death, will ever forget them ?

“ So much had been said of civilization having penetrated the lower classes ; the pessimists had been so learnedly refuted ; and it had been so clearly proved that their doctrine was foolish and calumnious towards our species : there had been so much boasting of intellectual light, and of the sovereign wisdom it had diffused—and here was a frightful mixture of effeminacy in the powerful, of ferocity in the poor, of uncertainty among the learned, of prejudice and superstition among the middle classes. To what, then, had served our progress, our conquests, and our pride ? And, in order not to fall into declamation too easily on such a topic, is it not true that Cairo, Aleppo, Jessor, those ‘ cities of the Plague,’ have not surpassed us in ingratitude, in frenzy, and in folly ; how many unheard-of crimes were revealed—how did the most absurd disbelief mingle itself with the most puerile credulity ! What strange and irrational methods of cure—seducing even the well-instructed ; whilst the poor and ignorant gave themselves up to chimeras, to which they sacrificed living victims.

“ There is a people eminently civilized,—a nation at the head of nations, armed with its five or six hundred journals, all beaming with light, and effervescent with reason. It doubts not at all that its well-paved streets, its well-administered system of highways, its polished manners, its progress in industrial arts, will soon put an end to the Cholera. The weather is magnificent ; the sky smiling blue ; the earth all blossoms ; the spring is awakening ; but yet the Cholera has appeared. The news flies past, and all is agitation ; the higher classes tremble ; the *gamin* of Paris laughs ; the citizens are frightened ; the artisans and labourers are revolted at the privations which it is desired to impose on them ; the scourge increases in intensity. It is perceived, at last, that narrow lanes, choked sewers, districts inhabited by a dirty and sickly population, floors inhabited by fifteen or twenty families—pavements, the fissures of which preserve the putrid mud to ferment in the sun—these little shops—those dark porter’s lodges where we place an old woman to be the spy of our actions, and the echo of our follies—the dark and ill-smelling passages of theatres and restorateurs,—that the whole organization, in short, of our splendid capital, multiplies the foci of corruption and offers a thousand conductors to the plague. Then we find various private interests rising up to resist the belief in the cholera ; the professions anathematise it—political parties place it on their anvil and endeavour to make it serve their turn. The soil of a great city is turned up and crime exhales from it. It is perceived, too late, that in this civilization, tortured by ten revolutions in forty years, what reigns after all—what constitutes its basis and foundation—is selfishness.



"We had been told that a great and active industrial system without morality, would be all-sufficient; that a civilization that had its Cuviers and Berthollets, or their equivalents, need fear nothing; that it matters little that the light and heat of the moral life should penetrate from the citizen to the artizan, from the artizan to the labourer, from the labourer to the lower classes,—undescribed and undescribable phenomena of vice and misery—moles in the dusty corners of old societies. This had been believed, but the cholera proved the contrary; it taught us to distrust the outward appearances of well-being and progress which the books of economists, the figures of philanthropists, and the complaisant expressions of orators, had pointed out to us; to render to ourselves a more exact account; to ask ourselves seriously, whether the arts of life, the means of existence, are improving and augmenting as it is supposed? Whether the condition of the people, their morality, their principles, their understanding, their welfare, are improving and advancing while the network of railways is crossing the country; whilst the wreath of smoke thrown up by our steam-boats is covering the Loire, the Rhone, and the Seine? If our social experience, our enthusiasm for novelty, our constitutions which we change like our shirts, our method of calling everything into question, of rooting up, transplanting, replanting, pruning, grafting, and mutilating the trees of our public institutions, is not most deeply injurious to the laborious classes, whose interests we pretend to have so much at heart? Whether, in short, the reign of material interests which had its inauguration in 1830, is to terminate on the summit of a yet unknown prosperity, or in the abyss of an inexpressible misery?"

In like manner did the Black Death bring to light the moral corruption of the Florentines nearly five centuries previously. Boccaccio tells us\* that—"When the evil had become universal, the hearts of all the inhabitants were closed to feelings of humanity. They fled from the sick and all that belonged to them, hoping by these means to save themselves; others shut themselves up in their houses with their wives, their children, and their households, living on the most costly food, but carefully avoiding all excess. None were allowed access to them; no intelligence of death or sickness was permitted to reach their ears, and they spent their time in singing and music, and other pastimes. Others, on the contrary, considered eating and drinking to excess, and an indifference to what was passing around them, as the best medicine, and acted accordingly. They wandered day and night from one tavern to another, and feasted without moderation or bounds. In this way they endeavoured to avoid all contact with the sick, and abandoned their houses and property to chance, like men whose death knell had already tolled.

"Amid this general lamentation and woe, the influence and authority of every law human and divine vanished. Most of those who were in office had been carried off by the plague, or lay sick, or had lost so many members of their families, that they were unable to attend to their duties; so that, thenceforth, every one acted as he thought proper. Others, in their mode of living, chose a middle course; they ate and drank what they pleased and walked abroad, carrying odoriferous flowers, herbs, or spices, which they smelt from time to time, in order to invigorate the brain, and to avert the baneful influence

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\* As quoted in *Hecker's Epidemics*.



of the air infected by the sick and by the innumerable corpses of those who had died of the plague. Others carried their precaution still farther, and thought the surest way was to escape death by flight; they therefore left the city, women as well as men, abandoning their houses and their relations, and retiring into the country; but of these also many were carried off, most of them alone, and deserted by all the world, themselves having previously set the example. Thus it was that one citizen fled from another, a neighbour from his neighbours, a relation from his relations; and in the end, so completely had terror extinguished every kindlier feeling, that the brother forsook the brother, the sister the sister, the wife her husband, and at last even the parent his own offspring, and abandoned them, unvisited and unsoothed, to their fate. Those, therefore, that stood in need of assistance fell a prey to greedy attendants, who, for an exorbitant recompense, merely handed the sick their food and medicine, remained with them in their last moments, and then, not unfrequently, became themselves victims to their avarice and lived not to enjoy their extorted gain. Propriety and decorum were extinguished among the helpless sick. Females of rank seemed to forget their natural bashfulness, and committed the care of their persons indiscriminately to men and women of the lowest order. No longer were women, relatives or friends, found in the house of mourning to share the grief of the survivors—no longer was the corpse accompanied to the grave by neighbours and a numerous train of priests, carrying wax tapers and singing psalms; nor was it borne along by other citizens of equal rank. Many breathed their last without a friend to soothe their dying pillow, and few, indeed, were they who departed amid the lamentations and tears of their friends and kindred. Instead of sorrow and mourning, appeared indifference, frivolity and mirth.\* Even so did the Plague evoke the licentiousness of the Athenians, nearly eighteen hundred years before Boccaccio recorded these facts.\*

Still, those Florentines of 1348 were not mere unpolished barbarians;—a quarter of a century had elapsed since the author of the *Divina Commedia* and the *Inferno* had passed from amongst them; Petrarch was now at the very height of his fame; the Medici, heading the new order of merchant princes, were vigorously employed in commencing the great work of placing a barrier of justice and philosophy between the commons and their hereditary scourges, the ancient nobility; and the period was remarkable as one of those rare intervals during which this unhappy city was not ravaged by internecine war.

Nearly all the license and profligacy which attended the outbreak of the Plague of 1665, and which followed its decline, originated with the Court. While the Noon-hall, within Whitehall, was being turned into a house of Playing, and scarce one of Charles's triflers stood reverently aside with Craven, and Monk, and Evelyn, and the Godolphins.—The city magistrates, Archbishop Sheldon, the nonconformist divines, and a strong body of physicians and surgeons had formed the determination, which a large proportion of their number maintained even unto the death, of remaining to strive religiously and manfully against the evil. Except in a few instances, this calamity appears to have been endured by the common people with singular resignation and fortitude.

Previous to the outbreak of the Cholera Pestilence of 1848, a stubborn indifference, a dull *vis inertiae* of reason and energy, not particularly

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\* Second Book of Thucydides.



characterised by either ignorance, irreligion, recklessness, or sloth, but partaking considerably of all these qualities, was the most prominent feature in the popular disposition of England. The following record is worthy of preservation for the sterling principle which it enforces :—

“ In April, 1847, when an epidemic typhus broke out, and ravaged the country with rapidly encreasing violence till, at last, in the autumn, it produced, for several weeks, fourfold the ordinary mortality, what measures of sanitary reform were adopted by the parish officers? What steps did they take to purge the air of those exhalations which are the recognised vehicles of typhoid poison?

“ When, in the eleven weeks from November 20th, 1847, to February 5th, 1848, there died in London upwards of 6,000 persons above the average number—an excess greater than the entire mortality produced by pestilential cholera during the whole 21 weeks of its prevalence in 1832,—what were the operations of the parish officers? What lesson did they learn from this frightful mortality? What steps did they take to secure us against its return?

“ When the febrile influenza—that forecast shadow of Pestilence, which preceded the Black Death, in the fourteenth century, the Great Plague of London in the seventeenth, and the first terrible invasion of Cholera in our own day—appeared with fearful significance two autumns ago, and slew in a single month (December) 1,000 of the inhabitants of London, where were the vaunted energy and sanitary skill of the parochial officers?

“ When, in the following spring, the Asiatic Pestilence itself, following its sure precursor, came travelling rapidly towards us across the continent, pursuing its old track, haunting its old lairs—entering even, in many places, the *very same houses* which it attacked before,—where were our parochial strategists? What scheme of operations did they plan, while there was yet time, to keep the Destroyer from our shores, or to defeat and expel him when he came?

“ The parochial officers did nothing—absolutely nothing. They left the graveyards festering—the cesspools seething—the barrels of blood steaming in the underground shambles—the great mounds of scutch putrefying in the Bermondsey glue-yards. They left us all—the poor in his squalor, and the rich in his fancied security—to be smitten unawares. And when at last it came, and the people were perishing by thousands, and the medical officer urged, month after month, on the parochial authorities, that the plague could only be combated *in the houses of the poor*, by an organized body of preventive inspectors, what did the parochial authorities do? They rejected the medical officer’s counsel—they scouted his warnings—they even mutilated his reports; and only in the fifteenth week of a mortality unparalleled for two centuries, did they consent to the nomination of the domiciliary inspectors—who, in *their very first round, discovered the corpses of six persons dead without medical aid!*”\*

In the history of every visitation of this kind, we can trace clearly how far the necessary moral elements for the prevention and endurance of pestilence aided the nations in their encounters with death.—The Florentines displayed strong natural reasoning powers, untempered by science, religion, or humanity. Elsewhere, superstition and thirst for blood were the mental disorders which the sting of this scourge wrought into popular frenzy during

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\* *Times*, Sept. 26th 1849; and *Quarterly Review*.



the height of the Black Death:—then, the unfortunate Jews of the continent were burned by thousands on suspicion of poisoning the wells:—in the plague of 1656, the Neapolitans raised a cry that the Spaniards had “sown poisoned dust” throughout their city, and one unhappy wretch was sacrificed on the wheel to allay their brutal clamours. During the great London Plague, we find callous indifference and frightful levity on the part of the Government; active and charitable, but unscientific and ill-conducted exertions on the part of the local magistracy, with a fair proportion of subordination and religious feeling among the people at large. The French met their trial with false philosophy, imperfect science, frivolity and outrage;—the English with passive insensibility to the often-repeated warnings of God and man; the Government were limited in their powers; the magistracy stubbornly and selfishly inert; the people indifferent—with abundance of really valid scientific power unemployed, and with no more philosophy and religion than was sufficient to prompt a comfortable self-congratulatory chuckle, when the work of destruction was past; and a transient disposition to thank the Almighty, for mere form’s sake, that its execution had not been wider.

#### *Emigration.*

Recently, a highly valuable Parliamentary Return has been published at the requisition of Mr. Hume, in which the number of emigrant ships which have sailed from ports in the United Kingdom during the five years from 1847 to 1851 inclusive, is given, together with the number of passengers and crews, and the proportions of wrecks and loss of life,—as shewn in the following tables:—

#### SHIPS.

	<i>Number sent.</i>	<i>Number of Wrecks.</i>	<i>Per centage of loss.</i>
Ships chartered by the Colonial Land and Emigration Commissioners. . . . .	252	1	·396=1 in 252
Ships despatched from ports under the superintendence of Government Emigration Commissioners. . . . .	5,964	30	·503=1 in 199
Ships despatched from ports not under the superintendence of Government Emigration Commissioners. . . . .	913	13	·142=1 in 70
Total. . . . .	7,129	44	·61=1 in 162

#### PASSENGERS.

	<i>Number embarked.</i>	<i>Lives lost by shipwreck.</i>	<i>Per centage of loss.</i>
In ships despatched by the Colonial Land and Emigration Commissioners. . . . .	72,340	0	0



In ships from ports under the superin- tendence of Govern- ment Emigration Officers. . . . .	}	1,347,361	922	·068=1 in 1,461
In ships from ports not under the su- perintendence of Government Emi- gration Officers. . .				
Total. . . . .		1,494,044	1,043	·069=1 in 1,432

The home papers announce that on the 27th May, 1852, "the parochial authorities of Saint Martin's in the Fields convened a meeting at which the first step was made towards employing the vast opportunities opened in our colonies by way of relief for the heavily taxed parishioners, and enlargement for the able-bodied paupers in their section of the Metropolis. A sum of £1,000, to be provided by a special rate, was then appropriated for emigration purposes, and it was calculated that the amount would defray the expenses of transmitting to Australia fifty individuals who, now, as inmates of the workhouse, are costing the parish at least £450, annually. In two years, therefore, the outlay will be reimbursed, even if not one of the favored emigrants should refund his debt, after his arrival in the lucrative labour market of the colony. The step is cautiously made, since a rate of 1*d.* in the pound will more than cover the whole sum risked; but it is a valuable precedent, both to the Government and to other parishes, and may prove the beginning of great things."

A recent official return shews that the Irish Emigration, from 1841 to 1851, amounted to 1,289,133 persons. The decrease in the population of Ireland, during those ten years, was 1,659,330.

During the present year, an important *Act for the Reclamation and Draining of Waste Lands* has received the sanction of Government. The following interesting table, shewing the comparative sanitary condition of the inhabitants on the Northern, or more elevated, and on the Southern, or lower, districts of the Metropolis, is given in McCulloch's *London* :—

	London.	North side of the River.	South side of the River.
Elevation of the ground, in feet, above Trinity high- water mark. . . . .	39	51	5
Density, or number of per- sons to an acre. . . . .	30	52	14
Number of Inhabitants to each House. . . . .	7	8	6
Annual value, in pounds, of Houses assessed to In- come-Tax for the year ending April 5th, 1843.	40	46	25
Pence paid for the relief of the poor to every £1 of House Rent annually— 1842-43.	13	12	18



Deaths from Cholera to 10,000 persons in 60 weeks ending Nov. 24th, 1849.	}	66	..	44	..	127
Deaths from all causes an- nually to 10,000 persons (5,000 males and 5,000 fe- males) living, during the 7 years—1838-1844... ..						
	}	252	..	251	..	257

Preparations are making for reclaiming Morecombe Bay. The rivers Crake and Leven will be confined to a fixed channel, and an area of about 145,000 acres will be gained.

The "Netherlands Land Enclosure Company" have undertaken the reclamation of 35,000 acres of land on the Scheldt, between Bergen-op-Zoom and Antwerp, under the management of Sir J. Rennie. Measures of this kind are, however, frequently of very questionable utility in a *sanitary* point of view. The long-talked-of Thames Embankment is now being constructed under an Act of Parliament.

*Statistics of Spirit Manufacture in the United Kingdom.*

The following figures, from various parliamentary reports, afford, upon the whole, an encouraging prospect to those who have the temperance cause at heart.—See page 80.

Quantities of Spirits which paid duty for Home consumption.

1840—22,656,200 gallons.

1841—20,805,817 „

Number of gallons of proof Spirit *Distilled* in the United Kingdom.

1851—24,543,657

With further reference to the Police statistics of drunkenness in the Metropolis, given in the note to p. 80—it is reported that, in 1851, the London Police apprehended 10,668 "drunken" persons, and 12,504 "drunken and disorderly" persons. Of the first class 1,914, and of the second 6,113, were convicted.

In February, 1852, the Scotch Public Houses' Bill was read a second time in the House of Commons. The measure will, probably, undergo considerable modifications before it passes into a Law. Still, it bears directly upon the important object of restraining the present excessive use of spirits in that country, by strict enforcement of a license system, and by placing a check upon the sale of spirits at the shops of grocers, "fleshers," and other traders. It appeared, in the discussion, that, while Scotland consumes 6,000,000 gallons of raw spirits annually, no less a sum than £1,200,000 a year is expended upon ardent spirits in Glasgow alone. The census of 1841 shewed that there were, in Scotland, 6,341 Publicans and Spirit Merchants, exclusive of Inn-Keepers. Excessive as the error of intemperance at present is in Scotland and Ireland, it is, assuredly, not a vice of modern introduction. In his notes to a recent edition of the *Tour to the Hebrides*, Mr. Carruthers, in describing Rory More's celebrated drinking horn, mentions that the Privy Council attempted to stint Rory More in his wine. In 1616, among other provisions to reform the Islands, it was enacted that the chiefs were not to use in their houses more than the following quantities of wine respectively—viz. Maclean of Duart and Sir Rorie Macleod, four tun each; Clanronald three tun; and Coll, Lochbuy, and Mackinnon one tun each. The author of *Ireland Sixty Years Ago* quotes Sir W. Petty, who stated that,



in 1682, when Dublin contained but 6,025 houses, no less than 1,200 of them were public houses, where intoxicating liquors were sold. In 1798, in Thomas-street, nearly every third house was a public house. The street contained 190 houses, and of these 52 were licensed to sell spirits. Among the upper classes the great consumption was claret, and so extensive was its importation, that, in the year 1763, it amounted to 8,000 tuns, and the bottles alone were estimated at the value of £67,000. It was said, then, that "no man who drank ever died, but many died learning to drink."

#### *Ventilation.*

The following are the best practical works of reference upon this subject:—"Dr. NEIL ARNOTT *On Warming and Ventilating Houses*:" "Dr. D. B. REID's *Illustrations of the Theory and Practice of Ventilation, with Remarks on Warming, &c*:" "*Ventilation Illustrated—a Tract for the Schools of Rich and Poor*: London. Churchill, 1848:" "*On the Warming and Ventilating of Public and Private Buildings, with illustrations*; by CHARLES TOMLINSON;" forming vols. 70 and 71 of *Weale's Series*: "BERNAN'S *History and Art of Warming and Ventilating Rooms and Buildings*."

Mr. Hurton remarks, in his *Voyage from Leith to Lapland*, that he was exceedingly struck, as he walked through the streets in Denmark, by the prodigious number of windows every house contained; the lower part, in some instances, seemed all glass. Even the "stud and mud" cottages in the outskirts had their rows of windows in some instances not eighteen inches apart. Nothing in the appearance of the towns he visited on his journey to the capital struck him so much as this peculiar and pleasant feature; \* \* Many a little cot in Denmark has more glazier's work about it than a substantial three or four-storied dwelling in England. This, however, will, doubtless, again become the practice in our own country; we have already cited Erasmus's allusion to the fact that (in 1497-1514) he found the English in the habit of glazing a great part of the sides of their chambers with small panes, fixed immovably, no doubt precisely in the manner in which the great lattice windows of old country churches are now constructed. But this was probably in the halls of the gentry, as Aubrey tells us that glass windows in churches and gentlemen's houses were rare before the times of Henry VIII., and that in his own remembrance before the Civil Wars, copy-holders and poor people had none. Sashes appear to have come in with William III. The first window-tax was levied in 1695. It is highly probable that open windows and ill-fitted casements had much to do with the comparative freedom from typhus and consumption which the commons of England enjoyed in ancient times.

#### *Water Supply of London.*

In April 1852, the Committee of the House of Commons, to whom the question of the supply of London with Water had been referred, adopted the draft of a law, which comprised both the future regulation of the water companies, and public supply of the Metropolis. It is understood that the provisions are satisfactory both to the promoters of the Government measure, and to the various water companies.

The chief provisions are, that—from and after the year 1855, it shall not be lawful for any company to take water for the supply of the Metropolis from any part of the Thames below Teddington Lock, or from any of



the tributaries of the Thames below the highest point to which the tide reaches in those rivers. That after the 31st of December, 1855, every reservoir within five miles of St. Paul's, in which a portion of the metropolitan water-supply is stored, shall be roofed in, or otherwise properly covered over, except in cases where the water is filtered by the company after it is discharged from such reservoir. All water for metropolitan supply shall be brought through pipes or covered aqueducts, unless it shall be afterwards filtered before distribution. All water shall be effectually filtered by the companies previous to its distribution. The draft also provides for the appointment of inspectors in cases where companies shall propose to adopt new sources of supply, defines the mode of enquiry in cases of complaint regarding the quantity and quality of the water supplied, and enjoins that, after the expiration of five years from the passing of the Act, each company shall maintain a *constant* supply of pure water in their mains "at such pressure as will make the water reach the top story" of all houses supplied, but not exceeding the levels prescribed in the special Acts of the several companies. The enquiry, of which these resolutions were the result, lasted seventy days, at an estimated cost of £1,000 a day!

On the 18th May last, the Committee are reported to have come to the following resolution:—"The Committee have heard enough to convince them that, for the purpose of affording a supply of pure and wholesome water to the northern and eastern districts of the Metropolis, recourse must be had to the river Lee and its tributaries in the neighbourhood of Hertford and Ware. The Committee are, therefore, dissatisfied with all the four bills before them, and are disposed to stop at the present stage of their proceedings, in the hope that the parties interested in the various schemes might come to some fair arrangement among themselves, by which a proper supply of water might be secured to those populous districts of the Metropolis."

The Act to make better provision respecting the supply of Water to the Metropolis received the Royal Assent on the 1st July, 1852. It provides that, from the 31st August, 1855, no companies, except the Chelsea Waterworks, are to take water from any part of the Thames below Teddington Lock, or from any part of any of the tributary rivers or streams of the Thames below the highest point to which the tide flows. From the above date, reservoirs, within a limited distance, are to be covered; from the 31st December, 1855, every company is to filter all water supplied by them for domestic use. All engines are to consume their own smoke.

One of the latest sanitary projects of the day is that of bringing sea-water, by incorrodible pipes, along the gradients and slopes of the Brighton and London Railway, to a great marine reservoir in the vicinity of the proposed site of the Crystal Palace at Sydenham, which is, in this way, to be rendered a sea-bathing establishment. The projectors declare that the supply might readily be extended to London, "at the rate of threepence per 100 gallons, or one good bath for a penny." If in reality practicable, this would prove an invaluable boon to the Metropolis, in affording an important means of mitigating the ravages of that fearful and noisome scrofula under which so many myriads of the London poor are constantly and hopelessly languishing.

*Condition of the Dublin Streets early in the Present Century.*

We are told by the author of *Ireland Sixty Years Ago*, that—"the state of the best streets, [of Dublin] about a century ago was much



worse than the Pill Lane or Goat Alley of 1847. There were no areas in front of houses, as there are now in all streets consisting of private residences; and the spouts, instead of being carried down to the ground by trunks, so as to suffer the water to run off in a confined stream, projected out either from the roof, or half way down the wall, so as to pour in torrents over a large space below after every shower. Sewers there were few or none, and many houses having no rere or place of deposit behind, the inhabitants threw all species of filth into the middle of the street, so that Dublin was as little purified as Edinburgh or Lisbon. As late as the year 1811, there was not one covered sewer in the most populous district of the city of Liberty, south of the Coombe; and it is a very singular circumstance, that when the great sewer through Capel-Street was commenced under the powers vested in the Paving Board, after 1806; that street being then one of the most populous in Dublin, and in which the most thriving shopkeepers of the day lived, the sewer was covered in at *the desire of the inhabitants*, and left unfinished. [It was so wide and deep in proportion to the breadth of the street, that the inhabitants were afraid the foundation part of their houses would give way and fall into it.] For want of sewers the filth and water were received in pits, called cesspools, dug before the doors, and covered in; and those continued in Sackville-Street and other places long after the year 1810; and many now remember the horrid sight and smell which periodically offended the inhabitants in the most fashionable streets when those Stygian pools were opened and emptied." It is further mentioned that, from an Act passed in 1717, it appears to have been a lucrative business to lay dirt in the streets for the purpose of making manure. It was a favorite amusement with the bullies of those days to place themselves in a narrow street-crossing, and to jostle or hurl into the filth which was heaped on either side every safe-looking passenger who had the temerity to venture across their way.

So late as 1786, we find Boswell describing Edinburgh as destitute of covered sewers.

A "*New Metropolitan Interment Bill*" has advanced to the second reading under the auspices of Lord John Manners and Mr. Walpole, and has been printed. The journals report that by it the present Interment Act (of 1850) is to be repealed. Powers are given to parishes severally to elect Burial Boards, to consist of not more than seven persons or less than three. These boards are to be permitted to purchase new burial-grounds out of the metropolitan districts, to be paid out of the poor-rates. Powers are given to parishes to combine for the purpose of providing interment accommodation; and, in that case, there is to be a joint board, to be composed of the several burial boards of the different parishes so combining. The bill gives power to the Government to have a cemetery of its own, to be resorted to by such parishes as may have no burial-grounds of their own. The Secretary of State, without inspection, has power to close any or all of the grave-yards of the Metropolis. He can issue such regulations as may seem to him proper for the protection of the public health, and has a veto on all the proposed sites for new cemeteries. Parishes may severally or collectively purchase new burial-grounds, but it is not rendered compulsory; for, although the burial-ground may be closed by order of the Secretary of State, yet the vestries are not obliged to elect a burial ground to provide fresh accommodation. No provision, except in cases of pauper funerals, is to be made for compensating the clergy,



clerks, or sextons; neither are the owners of private burial-grounds entitled to compensation. It is to be feared that some years must still elapse before the Londoners cease to realise the fate of the victims of Mezentius.

*Removal of Smithfield Cattle-Market.*

Early in June, 1852, it was announced that the Corporation of the City of London had agreed to purchase sixty acres of land in Copenhagen Fields for the New Metropolitan Cattle-Market. The purchase had accordingly been made. The price was £750 per acre, making the entire sum £45,000. Still it appears that the plan has met with strong opposition on the part of those whose property lies in the vicinage of Copenhagen Fields.

*The Prevention of "Accidents."*

The following remarks by Sir F. Head, on the course at present adopted by the French Government for the prevention of accidents in manufactories, &c., are highly worthy of attention:—

"The necessity for the Police of Paris is supposed to rest upon a principle everywhere acknowledged in France, that 'no one member of the community has a right to do that which is hurtful to all, and therefore that all persons should be prevented from doing so by regulations, or, in other words, by the exercise of despotic authority.' \* \* \*

Industrial establishments, are divided by the Police into three classes,—namely, dangerous, unhealthy, and offensive (incommode).

As regards the first, no one in Paris is allowed under any circumstances to do what may be dangerous to the community without obtaining an express order from Government; and accordingly, under this head, no steam-engine can begin to work within the city until it has passed an examination; and even then, if it be of high-pressure, it is not allowed to work, except within walls of certain thickness and under a roof of very little substance.

As regards the second, all manufactures of glue, size, and of everything deleterious to health, must be carried on far from buildings.

As regards the third, any machinery or manufactory, however safe, however innocuous, and although it may have cost a couple of millions of francs, may, by a simple order of police, be shut up, if, from noise, from smell, or from any other cause, it prove inconvenient to the neighbourhood.

The outside of every domicile and building is watched by the department of the police, whose duty it is to see that its fabric is secure, that its chimnies, gutters, &c., are sound; and that no sign-board, blind, or anything else, projects further than is convenient to all. The shops of Druggists, Cooks, and Bakers, and the Cellars of Wine Merchants are also under the especial surveillance of the police, who make strict enquiries regarding the qualities of articles kept and vended therein.

The accounts of certain recent calamities, from preventible causes, in crowded buildings, mines, and reservoirs, are so fraught with suggestive warning and practical instruction, that they demand something more than an ephemeral record in the chapter of accidents. Among these, the fearful destruction of life at Ninth Ward School House, New York, in December, 1851, stands prominently forward. The building in question consists of several floors, access to which is obtained by a spiral staircase; the bottom of the staircase is ten feet in diameter, and is



paved with stone. At the time of the accident, the school numbered 1,233 boys and 600 girls in different departments under their respective teachers. A teacher in the female department was attacked with sudden and unusual illness, a cry for water was raised among the scholars, a panic of fire spread throughout the school, and a rush through the various doors out upon the staircase almost instantly followed:—borne over by the encreasing crush, the balustrade gave way, and multitudes of children were hurled into the central well. "Before the current could be arrested, the well was filled with the bodies of children to the depth of about 8 feet. The teachers vigorously opposed the panic, but five of their number were forced into the gulf. Some of the boys jumped out of the windows, and one of them had his neck broken by the fall. The killed and wounded amounted to nearly a hundred. The coroner's jury strongly condemned the construction of the stair, and the unfitness of the balustrades to withstand pressure."

A similar panic occurred in New York, in the following January. A cry of fire was raised in a building five storeys high for the reception of newly-arrived emigrants, at that time containing 480 emigrants. Some leapt from the windows, others crowded madly upon the staircase until the balusters gave way, and many were precipitated to the floor beneath. In these ways six lives were lost.\*

The Society for the Protection of Life by Fire state, in their last report, that "the number of fires attended last year (to the 31st March, 1852), all occurring at night, had been 263, and the number of lives saved thereat 25; and during the last two months 42 fires had been attended and 15 lives saved.

The month of May, 1852, seems to have been unusually prolific in *Colliery Explosions* of the most calamitous nature, nearly all of which appear to have resulted from extreme neglect or recklessness. In that month, a frightful colliery explosion took place at Coppull, near Preston. It seems that a few of the workmen were provided with a Davy lamp, but that no valid restriction was placed on the use of naked candles. Recent accidents elsewhere led to the precaution of examining the pit in the morning before the men went to work. On this occasion, it was discovered that the air in a certain direction was in a dangerous condition, and the men were warned not to go down with a naked light; one of them, however, disobeyed this injunction, and *descended with a candle in his hand*, others followed his foolhardy example; and, a few moments after, a fearful explosion announced the consequence. Thirty-two lives were sacrificed, and six other persons seriously, if not fatally, injured. Since this, even, another explosion has taken place in Mr. Hargreave's Coal-mine at Coppull, in consequence of a collier *taking a lighted candle in his hand*; the fire-damp was ignited in a working which had been closed up some time. Two men and two boys were severely injured by the accident.

In the same month, sixty-five lives were lost by an explosion of fire-damp in the Duffryn Colliery, Glamorganshire. It is not known how the explosion occurred;—as all the workmen were supplied with safety Davy Lanterns,—it must have been the result of either carelessness or recklessness on the part of one or more of them. Indeed, it appeared at the inquest (the details of which are of a very practically important

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\* See *Chambers's Edinburgh Journal*.



character) that *candles were "uniformly used."* The exact cause, however, is not likely to be discovered, as all those who worked in that part of the mine perished. It is added that the Coal worked here is of a highly gaseous quality—the country being only recently mined—inasmuch that "numerous cargoes which have recently come from the shipping-port (Cardiff) have exploded and destroyed the vessels bearing them!" On that same day, an irruption of water from some old workings in the neighbourhood destroyed about twenty-eight colliers in the Gwendraeth Vale Colliery. "It had been observed that the water in the pit itself had been encreasing of late."

Nearly at the same time, it was mentioned that "one of the twenty-two colliers who recently perished in the explosion at Hebburn, was named Brucksbank, aged 26. He married a widow three months ago with three children. She had been four times married, and had lost three of her husbands by explosions."

On the 3rd June, a man was being raised up the shaft of the Starve-all Pit near Bristol, (where, about nine months previously, an accident attended with a large sacrifice of human life had occurred) when, from some neglect, the "bonnet" or shield not having been fixed above his head, a large piece of stone fell from above, and killed him instantaneously.

Still again, on the 14th of that month, one of the men employed in the Bunker's Hill Colliery, Bilston, accidentally (carelessly?) left open an 'air-door' through which he had to pass; consequently the ventilation of the main-body of the workings was prevented and the accumulation of explosive gas went on for about 24 hours; and as the first skipful of men were going to work, the gas suddenly ignited *from the unprotected candles carried by the men*; and this communicating with two casks of powder which unfortunately happened to be deposited in some part of the pit, these simultaneously exploded, destroying five, and seriously injuring seventeen.

One hundred and twenty-four vigorous men blasted into gory, blackened shreds; twenty-nine others suddenly drowned or crushed to death; twenty-three more fractured and lacerated, and reserved either for a miserable existence of pauperism, or to be numbered among those rent in pieces in some future "accident,"—all within two successive months—needlessly sacrificed by encountering madly, or upon compulsion, dangers which were absolutely avoidable in every single instance! Surely the Government will not delay in casting around this unhappy class of workmen a strict system of regulation which shall stand for them in the place of that reason which appears to be denied them.

The Journals give extracts from a Parliamentary paper containing a report from the Select Committee of the House of Commons on Coal Mines recently printed. It appears that the deaths, from explosions have latterly increased to the fearful number of about 1,000 per annum. The Davy Lamp requires encreased ventilation in mines, and the committee consider that the steam jet is the most powerful and, at the same time, least expensive method for the ventilation of mines. It was stated, in evidence, that 70 per cent. of the deaths from explosions were occasioned, not by the explosion of fire-damp, but by the after-damp which succeeds it. It is recommended that a central Board should be established, and that additional inspectors should be appointed, as some mines are never visited. It is suggested that to "the Board should be given a power to enforce penalties under ordinary circumstances of neglect; and, in cases of death, a power to facilitate an enforcement of



justice to the families of the victims through the ordinary channels of law.

In the reports of the recent calamity at Holmfirth, in Yorkshire, caused by the bursting of the embankment of a great Water Reservoir, by which upwards of 100 persons perished, and a loss of at least £200,000 was sustained, it is mentioned that "the foundation has always been suspected: one of the men who has perished, sent his family away, only a few days before the catastrophe, and was among those who watched the bank during the night. In addition, it seems, there existed some quarrel, through which the safety-machinery had got out of working-order."—"The Jury found a verdict, declaring that the Bilberry Reservoir was originally defective, and the commissioners, engineers, and overlookers, culpable; that the commissioners have been 'guilty of gross and culpable negligence' in allowing the reservoir 'to remain for several years in a dangerous state;' that they regret that, through the commissioners being a corporation, they cannot find them guilty of manslaughter: and that they hope Government will consider the subject with reference to future provisions." After the delivery of the verdict, Captain Moody, the Government Inspector, offered some remarks on the insecure state of one of the reservoirs. Describing the construction and the defects of the reservoir, he made this startling statement, "You remember how strongly I impressed upon you the importance of the waste or flood waters being able to escape freely; and that I recommended a by-wash in preference to a waste pit. There was a by-wash designed and constructed at this reservoir; but, when I went up to see it, I found that a wall had been built across it and firmly puddled, so that the water falling into this reservoir must have poured over the top; and, had it risen a few feet more on the night of the 4th, the time of the catastrophe, you would have had a flood down that valley, meeting the flood from the Bilberry Dam Reservoir at right angles, and the destruction would have been most awful. I assure you that, when I saw this wall built across the by-wash, my expression was, 'These people are insane.' I could not believe it possible that sensible men—mill-owners, knowing the operations of water—could suffer such a thing to exist. But so it was: I saw it with my own eyes, or I would not have believed it. By the instructions of the magistrates, I took upon myself instantly to order the removal of this wall." In conclusion, he referred to the miserable pay of the man in charge of each reservoir—£5 a-year. Intelligent and careful management could not be expected for that sum.

#### *Railway Accidents.*

The Return of Railway Accidents, for the half year ending the 21st December, 1851, shews that the number of passengers was 47,509,392. The number of persons killed was 113, and 264 injured. There were 8 passengers killed and 213 injured from causes beyond their own control; 9 passengers were killed and 14 injured owing to their own misconduct or want of caution; 30 servants of companies or of contractors were killed and 17 injured from causes beyond their own control; 32 servants of companies or of contractors were killed and 11 injured, owing to their own misconduct or want of caution; 33 trespassers and other persons, neither passengers nor servants of the companies, were killed by crossing or walking on railways. There was 1 suicide. The length of railways open on the 30th June 1851, was 6,890 miles, being an increase during the half year of 192 miles.



It appears that Mr. Tyer has succeeded in effecting a very important improvement in *Railway Signals*. The *Art Union* reports that these patented signals evolve a new system of communication with trains at long distances, by the agency of voltaic electricity, enabling the driver to receive a signal long before he can see those at the station to which he may be approaching; it will thus enable him to be cognizant of danger two miles distant, and stop a train when going at its fastest speed. The indications being made by words, not signs, error is avoided, and its improvement over the present system consists in one code of signals being used under all circumstances.\*

*Government Interference in recent Breaches of the Factory Act.*

On the 16th June last, in reply to a question from Sir John Tyrell, Mr. Walpole said he had caused inquiries to be made with respect to certain complaints made of the violation of the Factory Act in the city of Gloucester; and he was sorry to say that the Act had been grossly violated in that neighbourhood. He was resolved, however, that the provisions of the law should be enforced.

*Accidents to Shipping.*

It has recently been shewn that—"the total number of steamers built in the valley of the Mississippi up to 1849 was 1,656, of which number 736 had been destroyed. The loss of property incurred by the destruction of these vessels is estimated at 18,342,320 dollars." It is further reported that "the loss of life from steam-boat explosions, fires, &c. for the year ending June 30, 1851, was 1,013 persons."

On the 1st January, 1852, the crews of Her Majesty's ships and vessels of war numbered—Petty officers 4,431; able seaman, 11,118; ordinary seaman 4,096; landsmen 109; boys 4,765: total 24,519.

It appears from a return to Parliament that, in 1841, the number of British vessels which entered the port of London engaged in the foreign trade was 4,016 sailing and 626 steamers; and in 1851 the number was 5,190 sailing and 1,403 steamers; while of foreign vessels there were in 1841, 1,927 sailing and 72 steamers; and last year the number had increased to 3,474 sailing and 274 steam-vessels.

A Return of the House of Commons has been printed from which it appears that in 1851—611 vessels belonging to the United Kingdom were wrecked; of the number 600 were sailing vessels of 110,670 tonnage, and 11 steam-vessels the tonnage of which was 1,306.—These numbers appear to be more correct than those given in the note to p. 214.

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\* *Note on Accidents in Mines.*—Early in August last a very important verdict was given in the Edinburgh Jury Court, Second Division, by which one Janet Donald obtained £100 for herself, and £200 for her children, as compensation for the death of her husband who was killed in the pit of the Barton's Hill Coal Company, at Dyke-Head, owing to the unsafe condition of the pit, in which the deceased was engaged as a collier, or drawer.

A description and diagram of the *Steam Suction Fan* invented by Mr. Smyth, and now in full and most successful action at one of Earl Fitzwilliam's mines is given in the *Illustrated London News* for July 31st, 1852, (Literary Supplement). It certainly appears to be a ventilating apparatus of admirable simplicity and unequalled power. It is to be trusted that its adoption will entirely do away with the dangerous system of ventilation by furnaces.



"In the Parliamentary Report on shipwreck for the year 1836, the loss of British shipping wrecked or foundered at sea, is estimated, on an average of six years, at three millions sterling per annum. \* \* \* \* \* The annual loss of life by the wreck or foundering of British vessels at sea, is estimated at one thousand persons in each year. A wreck-chart, published in the first number of a useful little journal called *The Life-Boat*, gives the particulars of shipwrecks during the first eleven days of January, 1852. There were sixty ships, and *twenty-seven* human beings lost in that short period." \* \* \*

"To get at the truth in each case, the origin of every wreck ought to be as rigidly investigated as the cause of a violent death, or of a fire ashore. The members of the Royal National Institution for the Preservation of Life from Ship-wreck suggest, in their publication, that the Inspecting-Commander of the Coast-Guard of each district, the Collector, Chief-Officer of Customs, and Lloyd's Agents, could form a tribunal, in which all merchants and ship-owners would have confidence.

"Were such a body, with the assistance of the nearest Magistrate, authorised to enquire into, and report to the Admiralty or Board of Trade on every case of wreck, there is little doubt that, in a very few years, the list of wrecks on our own coasts would be greatly diminished. Some competent legal authority, accustomed to sift and weigh evidence, would be also requisite, to direct the enquiries, and to assist the deliberations, of a board of professional sailors, such as is here proposed. The Law furnishes many gentlemen exercising their profession in towns along our coasts. A small fee for each inquiry would ensure their services; and they would form a novel but useful body of Sea-Coroners."—*Household Words*; March, 1852.

Among the most recent inventions for the preservation of Life in Shipwrecks, Col. Colquhoun's Carriage for Launching Life Boats; Mr. Holbrook's Life-Boat; and the Messrs. Richardson's Raft deserve especial notice. For further recent information on the subject of Wrecks and Life-Boats, see a Lecture published by Capt. Washington, R. N., Bogue, London.

It appears that Mr. Lacon has devised a mode of fitting boats to steamers and other vessels, which promises to diminish considerably the loss of life in cases of fire and wreck.

Early in the present year it was announced that a committee was sitting at the Admiralty "to devise a method for the uniform lighting of ships and steamers at night, the object being to diminish the chances of accident or error to vessels at sea." Among recent inventions bearing upon this useful object, Mr. Babbage's plan for distinguishing the numbers, and thereby the names of light-houses by certain ingenious arrangements of the lights, deserves especial notice.

The Admiralty Commissioners have issued a notice instituting a code of regulations respecting signal lights to be observed by steamers and sailing vessels.

In pursuance of the Amended Steam Navigation Act, (14 and 15 Vict: c. 79.) since the 31st March, 1852, the Customs officers have been empowered to refuse to allow any vessels to put to sea, unless they shall be properly found in life-boats, fire-engines, signal-lights, and the other requirements for the preservation of life at sea.

It appears that, among other recent additions to the Science of Navigation, the discoveries of Redfield, Reid, Thom, and Piddington, relative to the Law of Storms, tend greatly to diminish the casualties by Hurricanes at Sea. In the XV. Number of the *Calcutta Review*, a list



is given of 58 casualties that befel the H. E. I. C.'s ships, from 1757 to 1800 inclusive, in which it is shewn that at least 14 of the wrecks might probably have been prevented, had the commanders understood the operation of storms in the Indian Seas, as determined by Captain Piddington.

For further particulars relative to casualties at sea, and the means for their prevention, reference may be made to—

BISCHOFF *on Marine Insurances*. 1836;

BALLINGALL'S *Pernicious Effects of Sea Insurance* (Pamphlet); and to

LIEUT. J. P. KYNASTON'S *Casualties Afloat; with Practical Suggestions for their Prevention and Remedy*. 1849.

#### *Statistics of Poisoning.*

It is mentioned, in the *Edinburgh Medical and Surgical Journal* that, in 1837 and 1838, the total number of deaths from poisoning in England and Wales, was 543; of these 261 were females, and 282 males. The number poisoned by Opium, or its preparations, was 186. Of these 52 were very young children, most of them at the breast, who sunk under the effects of the drug administered by mothers or nurses in ignorance of its powerful effects. The deaths of young children from opium or laudanum, administered in mistake for other medicine, were 20. The returns give 4 cases of the administration of savine and other poisonous drugs, with the view of procuring abortion. In 3 of these cases, the mother perished undelivered; in the fourth, the child perished. The deaths of 8 surgeons are entered; and it is remarked as a curious circumstance, that all of these had taken prussic acid. One had taken it with arsenic.

#### *Influence of Employment on Health and Longevity.*

The article on this subject in Dr. Reid's fifth chapter, will be found to contain much valuable information. Drs. Marks and Willis give the following additional references—RAMMAZZINI *on the Diseases of Artificers*, translated into French by Patissier, and into German with additions by Schlegel; also ADELMAN, on the same subject, Würzburg, 1803; FUCHS *on the Influence of Trades, &c., on Health*, in Hecker's New Annals; TURNER THACKRAH *on the Effects of the Principal Arts, Trades, and Professions, on Health and Longevity*, 8vo., London, 1831; and DR. CALVERT HOLLAND *on Diseases of the Lungs from Mechanical Causes*, 8vo., London, 1844.

#### *Mortality among the Insane before the Introduction of the present Mode of Treatment,*

The following *Statistics*, as cited by Dr. Reid, contain some important data for comparison.

M. Desportes gives the following table, in his Reports of the Salpêtrière and Bicêtre Asylums for the 9 years from 1825 to 1833 inclusive:—

#### *Lunatics.*

Admitted, .. ..	8,272
Discharged, Cured, ..	2,763
————, not Cured,	1,863
Dead, .. ..	3,854



The Reports of the Paris Asylums for 1822, 1823, and 1824, give the following proportion:—

Deaths from organic disease of the brain and membranes, ..	418
Deaths from various diseases, .. .. .	673
Total, ..	1,091

Dr. Reid gives a table compiled from the works of Burrows and other writers on Insanity, shewing the appearances discovered after death in 259 maniacs. In 68 of these cases there were marked Lesions of the Brain (Apoplexy in 27) Chronic Pneumonia in 20; Phthisis 22, Chronic Pleurisy 7, Chronic Peritonitis 9; Chronic Inflammation of the Digestive Canal 50; other organic Abdominal Lesions 27; there was no visible evidence of organic disease discovered in 56 cases.

Sir W. Ellis says that “of 152 male patients, 145 had disease very strongly marked either in the brain or its membranes. The other 9, including two idiots, died of other diseases. Of 67 females, 62 were found with disease of the brain and membranes.”

According to the Reports of the Bicêtre and Salpêtrière during the three years ending with 1834, the proportion of deaths, to all those admitted, was, in males, 25 to 100; in females 19 to 100—in both sexes 22 in 100.

“In the Senavra Hospital at Milan, a great proportion of the patients are of the very poorest description, and the mortality amongst them is very great. But the poor about Milan are generally very unhealthy, being subject to a particular disease called *pellagra*, supposed to arise from the influence of the swampy grounds in the neighbourhood, and which is considered a frequent cause of insanity in those districts.

Proportion of males to females, ..	87	to	100
—————cured, ..	57	to	59
—————dying, ..	40	to	45
Proportion of cures to admissions, ..	58	to	100
—————deaths to admissions, ..	42	to	100

#### *Mortality in Prisons previous to 1841.*

The following notes are given by Dr. Reid—“According to Mr. Cooper, the average mortality in the King’s Bench and Fleet Prisons is not more than 1 in 55. The greatest rate of mortality any where known among adults is at the Dépôt of Mendicity of St. Denis, at Paris. Here the annual deaths are nearly 1 to every 3 admitted! But the inmates are usually vagrants picked up in the streets of the capital without asylum or resource, the victims of calamity, disease, or debauchery. In the generality of prisons in Paris the mortality is about 1 in 23 annually. The mortality of the galley-slaves in France is only 1 in 49, while that of the whole French nation is 1 in 40. These slaves work in the open air, and are better clothed and fed than the other prisoners. The small proportion of the deaths is partly owing to the absence of children, and persons above 70, at which age they are released. Prisons in the Netherlands have a mortality of 1 in 27.”—*Dr. Hawkins’s Statistics.*

The following recent account appears to have been written in a rather excited spirit,—still it deserves attention.

“The dark cells of Millbank are fearful places, and sometimes melancholy mistakes are made in committing persons to them. You descend



about twenty steps from the ground-floor into a very dark passage leading into a corridor, on one side of which the cells—small, dark, ill-ventilated, and doubly barred—are ranged. No glimpse of day ever comes into this fearful place. The offender is locked up for three days, and fed on bread and water only. There is only a board to sleep on; and the only furniture of the cell is a water-closet. On a former visit to Millbank, some months ago, I was told there was a person in one of these cells. ‘He is touched, poor fellow!’ said the warden, ‘in his intellects.’ But his madness was very mild. He wished to fraternise with the other prisoners; declared that all mankind are brethren; sang hymns when told to be silent: and when reprimanded for taking these unwarranted liberties, declared that he was the ‘governor.’ They said he pretended to be mad: which, seeing that his vagaries subjected him to continual punishments, and procured him no advantages, was very likely! They put him into darkness to enlighten his understanding; and alone, to teach him how unbrotherly men are. Poor wretch! He was frightened with his solitude, and howled fearfully. I shall never forget his wail as we passed the door of his horrid dungeon. The tones were quite unearthly, and caused an involuntary shudder. On hearing footsteps, he evidently thought they were coming to release him. While he remained in the corridor, he did not cease to shout and implore most lamentably for freedom: when he heard us retreating, his voice rose into a yell; and when the fall of the heavy bolts told him we were gone, he gave a shriek of horror, agony, and despair, which rang through the pentagon, and can never be forgotten. God grant that I may never hear such sounds again! On coming again, after three or four months’ absence, to this part of the prison, the inquiry naturally arose, “What has become of the man who has pretended to be mad?” The answer was, “Oh, he went mad, and was sent off to Bedlam!”—*Dixon’s London Prisons.*

#### *Vaccination.*

*The Last Report of the National Vaccine Establishment* shews that, in the year 1851, 218,632 charges of lymph had been supplied to the National Board, being an excess of 29,262 beyond those of 1850. These numbers are encouraging, as compared with those of former years, the cases reported to the board as having undergone vaccination were 121,595, besides 11,984 vaccinated by their stationary vaccinators in London. The board express their regret that the public have still a disinclination, generally speaking, to avail themselves of vaccination, and again assert that the restriction of the protective power of vaccination to any age or any term of years, is an hypothesis contradicted by experience, and wholly unsupported by analogy.”

Dr. Reid says that “in 1795, when the population of the British Isles was 15,000,000, it was calculated that the enormous proportion of 36,000, or 1—420 of the whole population died annually from small-pox; which was 11 per cent of the whole mortality.”

#### *Mortality of Females in Child-birth.*

A considerable degree of uncertainty attends the generality of the statistics which have been adduced on this subject, inasmuch as considerable doubt attaches to the precise causes of death in the instances thus registered. It is probable that the numbers adduced are, for the most part, considerably too high. It appears that, upon the whole, this class of deaths has been long upon the decrease; and it is



certain that such casualties depend mainly upon removable causes. Casper gives the statistics of this class of deaths, in Berlin, as follows:—

1758	to	1763	..	1	in	95
1764	„	1774	..	1	„	82
1785	„	1794	..	1	„	141
1819	„	1822	..	1	„	152

Dr. Willan gives the mortality in the London Lying-in-Hospital (admitting about 5,000 annually, as follows:—

1749	to	1758	..	1	in	42
1759	„	1768	..	1	„	50
1769	„	1778	..	1	„	55
1779	„	1788	..	1	„	60
1789	„	1798	..	1	„	288

Dr. Marx, probably guided by Continental statistics, remarks that it has been ascertained, “That women in the country have not such good lives during the years in which they are liable to become mothers, as those who live in towns. Want of proper assistance may occasionally be the cause of the difference, but there can be little doubt of its being mainly due to the bodily labour which country-women are so commonly compelled to undergo at a time when they require rest, and should be exempt from toil.” The statistics of town and rural districts in England and Wales, as given by Mr. Farr, however, give a contrary result:—

*Counties. Cities.*

Child-birth, .. 217 .. 872

The Registrar-General's Report for 1839, gives 2,811 deaths of mothers in child-birth and miscarriage, or about 5 in the 1,000. In the preceding year the proportion was 4 in the 1,000.\*

The following table shews the proportionate number of deaths from child-birth in the several districts of England and Wales, as given by the Registrar-General, in 1842:—

	<i>Number of Births, Males and Females.</i>	<i>Total Deaths of Females.</i>	<i>Deaths from Child-birth.</i>	<i>Ratio of Mortality in the Puerperal state.</i>
ENGLAND.	252,535	172,925	2,687	1:94
<i>Divisions.</i>				
Metropolis, .. ..	29,294	22,495	321	1 : 91
South-Eastern, .. ..	22,324	14,571	163	1 : 137
South-Midland, .. ..	18,652	11,953	168	1 : 111
Eastern, .. ..	15,839	10,525	134	1 : 118
South-Western, .. ..	25,758	18,268	256	1 : 100.6
Western, .. ..	30,731	21,823	316	1 : 79
North-Midland, .. ..	17,648	11,343	167	1 : 106
North-Western, .. ..	37,040	26,626	461	1 : 80
York, .. ..	26,030	16,792	308	1 : 84
Northern, .. ..	13,551	8,747	209	1 : 65
Welsh, .. ..	15,668	9,782	184	1 : 85

\* Dr. Reid.



The following table, from the London Bills of Mortality, has been cited by Mr. Brayley in illustration of the increase in this class of deaths, and in the number of still-born children during the year of the Great Plague:—

<i>Abortive &amp; Still-born.</i>			<i>Child-Bed.</i>		
Year	Abortive	Still-born	Child	Bed	
1661	..	511	..	224	
1662	..	523	..	175	
1663	..	550	..	206	
1664	..	503	..	250	
<b>1665</b>	..	<b>617</b>	..	<b>625</b>	{ Total deaths of Females—48,737.
1666	..	477	..	253	
1667	..	488	..	262	
1668	..	751	..	271	
1669	..	517	..	277	
1670	..	632	..	288	

It will be seen, however, by reference to the preceding table, that in nearly forty-nine thousand deaths of females, six hundred and twenty-five deaths in child-birth was not a very remarkably high proportion.

#### *Proportion of Still-born Children.*

The following statistics\* shew that this class of deaths is also in a large measure subject to preventible influences.

It is stated that in Bohemia 1 infant in every 63 is still-born; in England 1 in 58; in Lower Austria, 1 in 41; in Sweden 1 in 40; in Hanover 1 in 30—in Prussia 1 in 32.

The proportion is much higher in large cities. In Glasgow, it is 1 in 14.† In Hamburgh and in Geneva, 1 in 15; in Marseilles 1 in 16; in Innsbrück 1 in 18; in Paris, 1 in 19; in London 1 in 24‡ in Presburg and in Edinburgh, 1 in 25.

It appears that the proportion of still-born male to that of female infants is about 13 to 10. M. Bellefroid found it to be nearly as 15 to 10 in Belgium. The same result has been found at Hamburgh, Paris and Geneva; and we are told that, in Prussia, during the years from 1826 to 1831, there were 59,144 still-born males and only 43,533 still-born females.

Dr. Reid notices that there are more still-born children in cold than in temperate climates; that the number is greater in winter than in summer, and that the proportion is trebled in illegitimate births.

In Geneva, of 9,833 *legitimate* births, during 20 years, 517 children were born dead, or 1 in every 19. Out of 1,092 *illegitimate*, there were 129 born dead, or 1 in 8.4 cases. We have already seen that, at Gottingen, out of 100 births, 3 *legitimate* and 15 *illegitimate* children were still-born.

In 1846, 38,529 illegitimate births were registered in England and Wales. The return for 1850 gives 40,306 in the registered districts—20,488 males and 19,818 females.

\* Chiefly quoted from Dr. Reid's Work.

† According to Dr. Watt, the burials in Glasgow in the five years ending with 1830, were 26,253; of which 2,007 were still-born children. In the five years ending with 1840, the burials were 45,215; the still-born children 3,226.

‡ The statistics of the Lying-in Charity of Guy's Hospital in 1835-36 give the proportion of still-born as 1 in 18.



*Statistics of Infant Mortality.*

Many evidences of progressive increase in the value of infant life might be adduced in addition to those cited at page 265. Dr. Willan's statistics of the London Lying-in-Hospital are as follow:—

*Deaths of Children.*

From 1749	to	1758	..	1	in	15
„ 1759	„	1768	..	1	„	20
„ 1769	„	1778	..	1	„	42
„ 1779	„	1788	..	1	„	44
„ 1789	„	1798	..	1	„	77

Dr. Marx quotes Casper and Stemmler to the effect that there are accurate Bills of Mortality extant for the city of Berlin for more than a century, from which it appears that 48 per 1,000 fewer now die in infancy than used to perish eighty years ago, and that 27 per 1,000 more now reach old age than formerly:—also that, in Stuttgart, of 100 born alive, 47 more than formerly now attain their 15th year.

Dr. Hawkins\* shews that in the Dublin Foundling Hospital (to which there is an infirmary attached for the treatment of sick children,) there were admitted, during the 21 years ending with 1796, 10,272 sick children; out of which number only 45 recovered!† From June 1805 to June 1806, however, 2,168 infants were taken into the Dublin Foundling and only 486 died there. At the Foundling Hospital at Vienna, according to the average published in 1810, more than one half of the children died. At the Foundling Hospitals of Petersburg and Moscow, of 37,000 children admitted in 20 years, 35,000 died. In the Province of Archangel, in 1812, 377 out of 417 foundlings were swept off during the first year. At Barcelona, in 1821, the fifth part of all the children born were abandoned to the Foundling Hospital: 463 were admitted during the year and 437 died! During the year 1823, 597 foundlings were received at the Hospital at Palermo, and 429, or 72 per cent. died! In Paris, out of 1,000 foundlings admitted, 251 were ascertained to die during the first few days, and 235 more on their road to the country nurses, or before the end of the first year.

Since the practice of sending infants to the country was commenced in the Foundling Hospital at Vienna, the deaths have diminished from 1 in 2 to 1 in  $4\frac{1}{2}$ .

The following table from a Parliamentary Return obtained by Lord Ashley, shews in a very striking manner the proportionate rates of infant mortality in five important English districts. It is for the year ending June 30th, 1841.

	<i>Proportion of Births to Population.</i>	<i>Per Centage of Deaths un- der two years old.</i>	<i>Per Centa ge of Deaths above sixty years old.</i>	<i>Proportion of total Deaths to Population.</i>
Leeds, .. ..	1 in 47·8	24·7	13·7	1 in 67·5
Essex, .. ..	1 „ 35·9	25·3	23·2	1 „ 51·5
Rutland, .. ..	1 „ 29·8	25·6	29·3	1 „ 37·7
Metropolis, .. ..	1 „ 32·8	30·1	20·4	1 „ 38·9
Manchester,.. ..	1 „ 31·7	37·4	12·4	1 „ 35·3

\* *Medical Statistics*, as quoted by Dr. Reid.

† Surely this must be a typographical error!



Bellefroid has shewn that at the very earliest age the expectation of life is greater in females than in males. He observes\* that, "In England the probable or insurable life of female children, at the period of birth, exceeds by about 5 years that of males. It is true that they lose this advantage after the first year, and that their chances of life are even less than those of boys at 4, 7, 8, 9, 11, and 14 years of age; but, at 15 years—the age which usually indicates puberty—they recover in part the advantage which they had at the period of birth." The following is a portion of a table which Dr. Bellefroid adduces as indicating the ratio of mortality in the sexes at different periods of life in Belgium:—

Age		Loss per cent. among Males.	Loss per cent. among Females.
From	0 to 1 year ..	22·0	17·6
"	1 „ 5 „ ..	15·0	14·4
"	5 „ 10 „ ..	4·5	4·1
"	10 „ 20 „ ..	5·9	5·2

The increase in the rate of infant mortality in Glasgow involves several points of striking interest. Mr. Watt found that, in 1821, the deaths of children *under 10 years* of age averaged 1 in 75 on the whole population, or 1·33 per cent. In 1839, they had risen to 1 in 48, or 2·08 per cent. Among the children *under 5 years* of age, the mortality, in the five years previous to 1831, was 1 in 101 or 0·98 per cent.; in the five years previous to 1841, it had amounted to 1 in 75·41 or 1·32 per cent. So that at the termination of twenty years, the number of deaths under *five years* of age had come as nearly as possible up to the average of deaths under *ten years* of age, which obtained at the commencement of that term. A fearful practical illustration of the concentrated evils which sanitary and moral reformers have to cope with in manufacturing cities!

The following quotation,† in which Dr. Combe cites the account given by Mr. Maclean of a visit to St. Kilda in 1838, also deserves more than a passing notice—"After remarking that the population of St. Kilda is diminishing rather than increasing, Mr. Maclean states that this unusual result is partly owing to the prevalence of epidemics, but chiefly to the excessive mortality which is at all times going on in infancy. 'Eight out of every ten children,' he says, 'die between the eighth and twelfth days of their existence!' On perusing this statement, the reader will naturally be disposed to wonder what poisonous quality can infest the air or soil of St. Kilda to cause such a tremendous destruction of life, and will infer that here at least there must be some powerfully deleterious influence at work which human means cannot successfully cope with. So far, however, from this being the case, Mr. Maclean expressly states that "the air of the island is good, and the water excellent!" that "there is no visible defect on the part of nature;" and that, on the contrary, "the great, if not the only cause, is the filth amidst which they live, and the noxious effluvia which pervade their houses." In proof of this, he refers to "the clergyman, who lives exactly as those around him do in every respect, except as regards the condition of his house, and who has a family of four children, the whole of whom are well and healthy;" whereas, according to the average mortality around

\* As quoted by Dr. Reid.

† *Sanitary Economy.*



him, at least three out of the four would have been dead within the first fortnight. When it is added that the huts of the natives are small, low-roofed, and without windows, and are used, during the winter, as stores for the collection of manure, which is carefully laid out upon the floor, and trodden under foot until it accumulates to the depth of several feet, the reader will not hesitate to concur in opinion with Mr. Maclean, and admit that, had the clergyman's children been subjected to the same mismanagement as those of the other islanders, the probability is that not one of them would have survived."

It was mentioned about a year since in the *Lancet* that, at the suggestion of Drs. Guersant, Baudelocque and others, a regular school for gymnastic exercises was attached to the Children's Hospital at Paris. Here those children who are in a convalescent state, and such other little patients, as are affected with certain diseases of the bones, may enter upon various kinds of gymnastic exercises. This school had been in full vigour for the preceding four years, much benefit had been derived from it, and no accident whatever had been recorded. More recently, M. Fourcault has proposed certain "Remedies against the Physical and Moral Degeneration of the Human Species, in the establishment of Schools of Gymnastics and Swimming. "Gymnastic Dispensaries," &c.

At the last Lewes assizes, Charlotte Larkin, a widow aged 42, was tried by Mr. Justice Coleridge for the manslaughter of her son aged ten months. This case was remarked upon as one of those "so frequently occurring in the country where the deaths of children have been occasioned by the administration of narcotics sold under different names to the poorer classes for the purpose of "soothing their children." It was proved that the woman had shewn herself an affectionate mother, "and that there was no ground for supposing that she had any idea of the dangerous consequences that were likely to ensue from her conduct;" still—she was found Guilty, and sentenced to three months, hard labour.

The public prints generally concurred in maintaining that it is not upon the ignorant and doubly unfortunate parents that the first weight of the law's retribution should descend in the moderation of this class of evils. Surely the iron grasp should first be laid upon the conscious and mercenary procurators and promoters of this crime. The Pharmaceutical Society should look to this.—The large and wealthy class of Druggists can well afford to hunt out and to prosecute with the utmost rigor the whole of those "sharp practising" wretches who now entail an unendurable amount of criminality upon their guild.

The following notes on the *Mortality which prevailed in the Navy* during the last century, are necessary to complete those given at pp. 281 and 289 (note).

"The first fleet of the East India Company, out of 528, lost 100 men before, and 5 after landing, in the voyage of seven months to the Cape of Good Hope. Anson, in three ships, lost 626 men out of 961, in ten months after leaving England, the men had scurvy, dysenteries, putrid fevers; their limbs dropped off; they swooned and died. In the year 1780, the Channel Fleet sent 11,732 sick to Haslar Hospital; 1,457 had Scurvy, 240 Dysentery, 5,539 Fever. At that time, Sir James Saumarez said, "neither the ships nor men could keep the sea more than two months."\* Captain Cook left Deptford, in 1772, with 112 men, sailed round the world, and returned in three years with the loss only of 4

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\* Cited by Sir G. Blane, Diss., vol. i., p. 18.



men by accidents, and one by disease. Cook, in a paper read before the Royal Society, described the means which he employed to secure the health of his crew; the care which was taken in the selection of a vessel, in drying and ventilating, in providing good provisions, antiscorbutics, and an abundant supply of fresh water. In the third voyage, the men were equally healthy. After some years had elapsed, and a reform of the Naval Administration,\* the principles established by Cook were carried out by the Admiralty, and the health of the Navy was raised to a satisfactory standard. In Parry's three voyages of a year and a half and two years' duration, only seven men died out of 334. The annual mortality in the last voyages was 0.5 per cent.† For a description of the shameful manner in which our Navy was victualled under a much-abused contract system, towards the end of the last century, see the History of the Mutiny at Spithead and the Nore.‡ Accounts are from time to time appearing which would countenance the belief that not a few of our own merchant vessels still deserve to be regarded as mere floating slaughter-houses. Early in last June, the papers announced that no less than 274 persons, principally Chinese Emigrants to California, had died on board a British Ship, the *Lady Montague*, of 760 tons burden, between the 11th February, 1850, when she left China with no less than 500 souls on board, and the 18th of the following June! The circumstances under which this frightful mortality occurred have not been clearly ascertained, but it appears that the water and provisions which had been supplied for the emigrants became putrid, and that the sufferings of the poor creatures were so unendurable that several of them committed suicide by jumping overboard. When the ship reached Hobart Town, on the 13th April, the mortality on board had been frightful; here medical and other assistance was obtained, but after the vessel left that port, the fever again broke out, and a nearly equal number of unfortunates perished. At about the same time it was stated in the Journals that the British Ship *Sir Charles Napier* had arrived at San Francisco from Panama, having been ninety days on the passage! She started with 174 passengers, and lost 36 of them during a three weeks' prevalence of measles, dysentery, and fever. In March last, the French Academy of Sciences awarded a prize to M. Masson for having introduced means of preserving vegetable substances, an invention calculated to be of great service to the crews of French vessels.

The General Mortality in the French Army is reckoned [in 1841] at 1 in 48: but according to Colonel Paixhans (in his statements concerning the mortality of the French Army, made before the Chamber of Deputies, in the discussion regarding the levy of 80,000 conscripts, for the year 1838,) the mortality of French Soldiers, even during peace, is much greater than that of men engaged in civil pursuits. According to his statements, the mortality of young men of 20 years of age, engaged in civil pursuits, was only about 1 in 83, and among those of 27 years of age about 1 in 71. In the Army, among the non-commissioned officers, it appeared that the mortality was only about 1 in 91, but among the senior soldiers, from 26 to 27 years of age, it was so high as 1 in 50; and among those who were only five years in the service, commencing at 20 years, the mortality increases to

\* McCulloch's *Statistics of the British Empire*.

† Registrar-General's Report, Last Quarter of 1846.

‡ *Family Library*, No. LXXX., p. 5.



1 in 33; among those of four years to 1 in 22; among those of three years to 1 in  $19\frac{1}{2}$ ; among those of two years to 1 in  $15\frac{1}{2}$ ; and among the young soldiers, those in the first years of service, the mortality was so very high as 1 in  $13\frac{1}{2}$ . The annual mortality among the veterans in the Hotel des Invalides was 1 in 20; among the troops in the colonies 1 in about 14; and among those in Algiers about 1 in 12!\*

The following notes, from Hecker, Blackstone, Chambers and other authorities, embody the principal regulations which have been instituted for the maintenance of *Quarantine* and other systems of *Isolation*. Hecker mentions that in the latter end of the autumn of 1347, four ships full of plague-stricken persons returned from the Levant to Genoa, where the disease spreading with astonishing rapidity, the Genoese in the ensuing year forbade the entrance of suspected ships into their port. These sailed to Pisa and other cities on the coast, introducing the Black Death in all its direst malignancy. The same authority states that the first regular system of *Isolation* in Italy originated with Viscount Bernabo, and is dated January, 1374. "Every plague patient was to be taken out of the city into the fields, there to die or recover. Those who attended upon a plague patient, were to remain apart for ten days before they again associated with any body. The priests were to examine the diseased and point out to special commissioners the persons infected, under punishment of the confiscation of their goods, and of being burned alive. Whoever imported the plague, the state condemned his goods to confiscation. Finally, none except those appointed for that purpose, were to attend plague patients under penalty of death and confiscation." So also when plague broke out in Italy, for the sixteenth time, in 1399, it was ordered that no stranger should be admitted from infected places, and that the city gates should be strictly guarded: while infected houses were to be ventilated and fumigated for at least eight or ten days, and all bedding, clothes, &c., were to be carefully purified. At the coronation of Louis XII. in 1498, when a great number of the nobles came to Paris to take part in the ceremony, the provost desiring to guard them from the danger of infection, published an order that all persons of both sexes suffering under certain specified maladies, should quit the capital in twenty-four hours, *under the penalty of being thrown into the river!* Hecker thinks that Bills of Health were probably first introduced in 1527, during a fatal plague which visited Italy for five years (1525-1530), and which called forth redoubled caution. The first Lazarettos were established upon islands at some distance from Venice. The Quarantine regulations were every year improved and increased in needful rigour, so that, from the year 1585 onwards, no appeal was allowed from the sentence of the Council of Health! and the other commercial nations gradually came to the support of the Venetians by adopting corresponding regulations: bills of health, however, were not general until the year 1665. It is stated that, by a Parisian ordinance of 1533, persons recovering from a contagious malady, together with their domestics, and all the members of their families, were forbidden to appear in the streets for a given period, without a white wand in their hands, to warn the public of the danger of contact. Three years later, the authorities were yet more severe against the convalescents, who were ordered to remain shut up at home for forty days after their cure; and even when the Quarantine had expired, they were not allowed to

\* As cited by Dr. Reid.



appear in the streets until they had presented to a magistrate a certificate from the commissary of their district, attested by a declaration of six householders, that the forty days had elapsed. No sooner did a contagious malady, or one that was supposed to be so, make its appearance, than the inhabitants of Paris were all forbidden to remove from one residence to another, although their term of tenancy had expired, until the judge of police had received satisfactory evidence that the house they desired to leave had not been visited by the contagion. When a house was infected, a bundle of straw fastened to one of the windows warned the public to avoid all intercourse with the inmates. At a later period, two wooden crosses were substituted for the straw, one of which was attached to the front door, and the other to one of the windows in an upper storey. In 1596 the Provost of Paris having learned that the tenants of some houses infected by an epidemic which was then making great ravages, had removed these badges, issued an ordinance that those who transgressed in a similar manner should suffer the loss of the right hand, a threat which was found perfectly efficient. All this in the never-cleansed murky "ruelles" of the Cité, where we are told that about 30,000 souls inhabited thirteen hundred gigantic overhanging houses, and 700 shops within the narrow compass of an island only 2,400 feet long, by 750 wide, into which were also crammed eleven churches, two chapels, six squares, two Collegiate Churches, the great Cathedral, the Archbishop's Palace, the "Palais," which alone occupied a fourth part of the entire space, the great Hospital of the Hotel Dieu, and three prisons, besides other public buildings.\* James the First appears to have immediately recognised the necessity of adopting measures for the limitation of the Plague, which was raging in the city of London at the time of his coronation.† The statute of 1 Jac. I., c. 31, enacted that "if any person infected with the plague, or dwelling in any infected house, be commanded by the mayor or constable, or other head officer of his town or vill, to keep his house, and shall venture to disobey it, he may be enforced by the watchmen appointed for the purpose to obey such necessary command: and if any hurt ensue by such enforcement, the watchmen are thereby indemnified. And further, if such person goes abroad, and converses in company, if he has no plague sore upon him, he shall be punished as a vagabond by whipping, and be bound by his good behaviour: but if he has any infectious sore upon him, uncured, he then shall be guilty of felony." We have seen (p. 45-6) that rather active measures of "Quarantine" and Isolation were employed in London to avert and limit the Scourge of 1665: but it appears that Quarantine laws were established in England in 1709. According to Blackstone, the statute 26 Geo. II c. 26, explained and amended by 29 Geo. II, c. 8, placed the method of performing Quarantine by ships coming from infected countries on a much more regular and effectual order than formerly. Persons guilty of infractions of these laws were punishable as felons without benefit of clergy. The 6 Geo. IV. c. 78 repealed all former Quarantine Acts, substituting other provisions, and establishing pecuniary fines and other penalties for infractions of the Law.

\* From a spirited article on Paris.—*Blackwood's Magazine*, 1842.

† The inhabitants of the City were forbidden, by proclamation, from coming to witness the ceremony at Westminster, lest the pestilence should be conveyed thither.



A discussion of the subjects *Capital Punishments, Duelling, and War*, has been purposely excluded from the body of this work, as these questions, apart from their controversial character, have very extensive and comprehensive bearings, and as they are, at present, very advantageously invested with the philanthropists of Exeter Hall. No right-minded man can reflect upon the judicial death even of the most atrocious murderer without a regretful shudder, and a thanksgiving that such retribution has ceased to be practised, except upon the direst necessity. A casual glance at the public prints of the last century is sufficient to lead every Christian gentleman to rejoice that he can now preserve his honor unquestioned, throughout a long life, without walking under the daily risk of having to sustain it at the peril of blood-guiltiness;\* and no soldier, worthy of the name, has ever viewed war otherwise than as the heaviest of necessary evils. Still, it is evident that the removal of these great social and national calamities can only result from the establishment of the highest standard of civilization:—the means for their extinction are slowly developing themselves—the evils will gradually die out, whenever the disorders of society which evoked them shall cease to need their control,—it is only in this manner that they can be expected to disappear from amongst us.

The Law of God, and the opinions of the majority of God-fearing men enforce the rule that the punishment of Death may not cease to be inflicted until the crime of Murder shall be unknown in society. The national cure for War is, certainly, the very remotest of the objects to which man can ever expect to extend his Religion and his Civilization. It is true that unjust and cruelly oppressive wars are almost universally discountenanced by popular opinion—a step towards their disallowance in

“the parliament of man, the federation of the world,”

still, until all the races of the earth shall be sufficiently Christianised, enlightened, and honest, to enter into an inviolable compact of peace and fraternity, the swords of the warrior nations can never be cast away. While it continues to be a self-evident fact that a quarter of a century of universal fraternization and exclusive devotion to the arts of peace would place the world at the mercy of any ten thousand semi-civilized savages, any one of whom should have retained the art of finishing a rifle-lock—gun-founderies, dock-yards, arsenals, recruiting establishments and parade grounds will be viewed as our most available means of securing national tranquillity. A well-organized police, a long interval of national peace, and we would trust, an advance in our Christianity and enlightenment, have nearly removed the necessity for duelling from amongst us;—the practice has long ceased to be a national curse—it is now ceasing to be one of the requirements of society. We must,

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\* This necessity used not to be confined to men of high birth and fair station—the tradesman, the artizan, and the private soldier, were alike subject to the “Laws of Honor.” Such announcements as the following were by no means rare seventy or eighty years ago—“On Wednesday Morning last, two Men, Taylors by Trade, who had formerly belonged to Elliot’s Light Horse in the late High German Wars, and had behaved with great Bravery, but were reduced to their original Occupation, quarrelled, and, as they had borne Arms, they agreed to determine the Difference with Pistols in St. George’s Fields, when one of them received a Ball through his Arm, and the Affair was amicably made up?”—*Public Advertiser*, Jan. 14, 1771.



then,—while absolutely questioning, in detail, many of the leading arguments of those charitable social reformers who devote their lives to the preparation of remonstrances against the Punishment of Death, and fulfil their mission by haranguing at the meetings of Peace Congresses and Peace Societies,—regard the spirit which actuates their exertions with hopefulness and good-will—believing that, although the sweeping reforms sought for are neither practicable nor necessary, in the present day, the frequent agitation of such questions will gradually tend to develop, in nations and in societies, certain humane and generous opinions which, in their progressive increase, must extinguish, one by one, all the worst atrocities of public injustice and cruelty, and place an absolute check upon the graver forms of private tyranny and wrong.

It appears that the *system of procuring employment for the inmates of Night Asylums*, alluded to at p. 231, has been carried out to a certain extent in London. In March, 1850, a registry was opened at the Leicester Square Soup Kitchen, in which the names and occupations of those seeking employment were, (and probably still are) gratuitously entered. In the following June it was announced that the registry had been attended with excellent effects; for, out of 606 applications made to the secretary since it was established, various situations had by that means been obtained for upwards of 300 persons.

The latest English papers (dating from September 8th, 1852,) convey accounts from Russia purporting that the *Asiatic Cholera* has again made its appearance in Poland, Posen and Silesia, and that it had even reached Elbing and Dantzic. In the middle of August it was destroying upwards of 200 daily in Warsaw. This is an announcement of no trivial moment to England, when it is remembered that the cholera of 1848 entered Warsaw in the month of August, and that it gained its first footing in London early in the following October. A certain degree of doubt is considered to attend these statements; still, it will not be forgotten that some of the luminaries of the press contended to their utmost against nearly every step which the Cholera was announced to have taken in its last advance upon England. The Pestilence was, undoubtedly, raging on the Western frontier of Persia in the autumn of last year; it had then advanced to Bagdad, and was expected to appear in Constantinople towards the end of this year. It is mentioned that two medical men will proceed abroad to watch and report the progress of the malady. There is every reason to fear that, whenever this scourge shall again fall upon the British Isles, the inhabitants will receive a fearful demonstration of the fact that no single valid preventive measure of really national importance has been adopted since the pestilence of 1848-9 swept away upwards of fifty-three thousand lives in the registered districts of England and Wales alone.\* In respect to Drainage, Water Supply, Street Cleansing, Intramural Interment, Public Markets, and indeed, as regards all the most vital essentials of Sanitary Reform, London of 1853, promises to be scarcely in any degree superior to London of 1831, and of 1848. The present time is not one for hopeless and helpless inaction. Three months' devotion of London's wealth and energy to the task, aided by the regulating control of Government,

\* The Registrar-General's Report gives the number of deaths as 53,293.



and by the science and philanthropy of Southwood Smith, Shaftesbury, Carlisle, Owen, Chadwick, Guy, Playfair, Grainger, and Simon, might suffice to set a seal upon every reeking graveyard within the precincts, to remove every offensive market, to extirpate every typhus nest, and every nuisance destructive to public health, to banish smoke from the town atmosphere, to send abundant streams of river water perpetually coursing throughout the whole network of sewers, to render every street and alley as free from mud and putrid offence as are the pathways in St. James's Park, to abolish every cesspool, and to admit the air and the sunlight freely to every dingy court, and stagnant cul-de-sac. Could every hand which will lie blue in its winding-sheet before the next pestilence departs from the city, now be brought to strive energetically against the evils which are threatening its master with destruction, we might still hope under the blessing of Providence, either to avert the menaced danger altogether, or to deprive it of nine-tenths of its fatality. It is a plain and self-evident fact that at least fifteen thousand lives would perish should Asiatic Cholera invade London in its present condition. No man of sense and generous feeling can fail to perceive that this is an evil which calls for the immediate employment of every measure which has a known preventive tendency, and the intellects of those who are less happily gifted will scarcely question the demonstration which Lyon Playfair will afford them, that the destruction of those fifteen thousand lives will be attended with a pecuniary loss of nearly five millions sterling. During the three years ending with 1850, upwards of seventy-three millions sterling\* have been raised in the United Kingdom in the furtherance of one single item in the sum of national *convenience*—Railway Traffic: the moment is now approaching at which it will be shewn with terrible demonstrativeness, whether the Englishman most values his money or his life. The time is surely one in which our countrymen should be up and doing, in the vigorous exercise of those powers which the Almighty has placed within their reach for the Prevention of impending Death.

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\* The Companies' Returns to Parliament give a total of £ 73,332,105, for the three years.

#### END OF THE FIRST VOLUME.

*(Concluding that Portion of the Work which has reference to Public Health, and Vital Statistics, generally.)*



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## ERRATA AND CORRIGENDA.

The Author has to solicit some allowance from his Readers for a very unusual number of Errata and Corrigenda. It was found impossible to bring this work out within a moderate time, unless the usual course of sending proofs to the author for correction should be dispensed with:—consequently, with the exception of a few pages, the work was not subjected to the usual literary revision in going through the press; and although the Printer has performed his task with considerable accuracy, many errors have necessarily crept in. The present corrections, however, have been made upon a very careful revision of the volume.

Page	7	line	1	(note)	for	contribution,	read	contributor.
"	9	"	16	(note)	"	males,	"	deaths.
"	—	"	42	(note)	"	the Bellefroid	"	M. Bellefroid.
"	17	"	32	(note)	"	measle	"	measles.
"	18	"	14	.. ..	"	cases	"	races.
"	22	"	1	et seq	"	Removeable	"	Removable.
"	24	"	2	from foot	"	any	"	many.
"	26	"	6	from foot	"	direct	"	direct.
"	29	"	21	.. ..	"	breath	"	breathe.
"	35	"	26	.. ..	"	medical	"	the medical.
"	38	"	2	.. ..	"	to be	"	to have been.
"	40	"	2	(note)	"	parts	"	facts.
"	41	"	1	.. ..	"	brought into	"	brought us into.
"	42	"	1	.. ..	"	filths	"	filth.
"	—	"	11	from foot	"	conclavium	"	conclavia.
"	—	"	last	.. ..	"	engine-carts	"	engines-carts.
"	45	"	2	fm. ft. (note)	"	certainly	"	certain.
"	46	"	14	fm. ft. (note)	"	Few	"	A few.
"	47	"	8	from foot	"	intermission	"	intermissions.
"	51	"	9	from foot	"	Medical	"	Medicinal.
"	53	"	6	.. ..	"	instructions	"	instruction.
"	54	"	3	.. ..	"	20,919,513	"	20,919,531.
"	—	"	2	from foot	"	£105,874,907	"	£105,874,607.
"	55	"	16	.. ..	"	wants	"	want.
"	57	"	4	from foot	"	'tween-deck	"	'tween-decks.
"	—	"	2	fm. ft. (note)	"	hospital	"	hospitals.
"	65	"	3	from foot	"	Anello's	"	Aniello's.
"	66	"	8	.. ..	"	meats	"	meals.
"	67	"	1	.. ..	"	altho' unwillingly	"	all unwitting-
"	68	"	8	.. .. after	Douro	omit (, )		[ly
"	72	"	10	.. .. after	excise	insert (, )		
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"	—	"	2	(note)	"	cures	"	cases.
"	77	"	7	.. .. after	prohibitory	omit (, )		
"	80	"	19	(note)	for	265	read	365.
"	81	"	11	.. ..	"	allowance	"	supply.
"	83	"	19	.. ..	"	orders	"	organs.
"	91	"	7	fm. ft. (note)	"	magnet	"	a magnet.
"	92 et seq	"	2	from foot	"	Bandeloque	"	Baudeloque.
"	96	"	13	from foot	"	edges	"	wedges.
"	97	"	16	.. ..	"	Edward	"	Edwards.
"	109	"	16	.. ..	"	Auster	"	Austin.
"	—	"	21	.. ..	"	exception	"	exemption.
"	111	"	13	.. ..	"	houses	"	house.
"	112	"	1	(note)	"	sewer	"	sewers.



Page 113 line 23 Authorities differ with regard to the number of sewers which open between Richmond and London Bridge, it is probably, at present not much less than 250.

"	114	"	7	..	..	after	inhabitants	insert	of Sheffield.
"	—	"	18	..	..	for	(?)	read	(!)
"	117	"	1	..	..	"	Boassingault	"	Boussingault.
"	119	"	2	(note)	"	"	the great	"	that great.
"	121	"	last	..	..	"	from	"	pour.
"	122	"	23	..	..	"	and the	"	and by the.
"	123	"	15	..	..	"	Arnwell	"	Amwell.
"	124	"	23	..	..	"	marines	"	mariners.
"	128	"	6 fm. ft. (note)	"	"	"	Water-baths	"	Water-butts.
"	131	"	1	..	..	"	for	"	far.
"	132	"	6 (note) et seq	"	"	"	25°86'	"	25°86.
"	133	"	23	..	..	"	Prof. Brande's	"	the Board's.
"	135	"	16	..	..	"	rain-waters	"	river-waters.
"	140	"	7	..	..	"	abundant	"	abundance.
"	141	"	3	..	..	"	natural	"	national.
"	—	"	4	..	..	"	act	"	art.

It has been judiciously suggested that the word "carriages" in the note has not reference to vehicles, but to burthens or things carried.

"	144	"	13-14	..	..	the	asterisk to follow	the word	article.
"	150	"	23	..	..	after	manufactories	insert	in the heart of
"	152	"	6	from	foot	"	ordained	insert	that. [towns.
"	156	"	2	from	foot	for	insued	read	issued.
"	157	"	26	..	..	"	Murray	"	Manny.
"	162	"	3 fm. ft. (note)	"	"	"	furnace-grate	"	furnace grate.
"	164	"	9	from	foot	after	antiseptics	insert	and
"	168	"	19	..	..	for	free, tasting	read	free-tasting.
"	171	"	26	..	..	"	view	"	review.
"	172	"	4	..	..	"	purpose	"	purposes.
"	174	"	3 (note)	"	"	"	in compounding	"	in the compound-
"	175	"	17	..	..	after	the other	insert	of these. [ing.
"	176	"	27	..	..	for	other	read	others.
"	177	"	27	..	..	"	hiss heep	"	his sheep.
"	180	"	11	..	..	"	use	"	uses.
"	182	"	23	..	..	"	substanses	"	substances.
"	187	"	3	..	..	"	even	"	ever.
"	—	"	5	from	foot	"	and	"	a
"	189	"	8	..	..	"	operation	"	progress.
"	198	"	1 (note)	"	"	"	Foucault	"	Fourcault.
"	199	"	8	..	..	after	temperature.	omit	Hence.
"	211	"	3 fm. ft. (note)	for	Si	read	Sic.		
"	213	"	2	from	foot	the	asterisk should follow	160,509, 9 lines	
"	—	"	5	from	foot	for	60,071,131	read	6,071,131.
"	214	"	9	from	foot	before	the	dele	(")
"	215	"	16	from	foot	for	danger	read	dangers.
"	226	"	9	from	foot	"	scurf-skin,	"	scarf-skin.
"	229	"	13	..	..	"	munccheon	"	nuncheon.
"	230	"	2	from	foot	"	mighty	"	might.
"	232	"	5	from	foot	after	3,500 in-patients	ins.	each.
"	242	"	last	..	..	for	elapsed	read	elapsed.
"	244	"	6	from	foot	"	in	"	of.
"	—	"	8 fm. ft. (note)	"	"	"	Siegburg	"	Tiegburg.
"	247	"	14	..	..	"	23·345	"	23·39.
"	248	"	8	from	foot	"	100	"	1000.
"	—	"	7	from	foot	"	11·14	"	11·47.
"	249	"	13	..	..	"	needless	"	heedless.



Page 253 line 11	from foot	<i>for</i>	29	<i>read</i>	9
" 254 "	8 from foot	"	Keep	"	keep.
" 255 "	3 from foot	"	any	"	an.
" 259 "	9 .. ..	"	XIX	"	XX.
" 264 "	7 from foot	"	XX	"	XXI.
" 267 "	6 .. ..	<i>after</i>	75,	<i>insert</i>	on the whole po- pulation.
" 273 "	8 .. ..	<i>for</i>	victim	<i>read</i>	victims.
" 279 "	last (note)	"	tree	"	three.
" 280 "	1 .. ..	"	XXI	"	XXII.
" — "	6 .. ..	"	mind	"	minds.
" 284 "	16 .. ..	<i>before</i>	appropriated	<i>insert</i>	was.
" 288 "	25 .. ..	<i>for</i>	mith	<i>read</i>	with.



The Second and Concluding Volume of this Work is in progress ; it will be devoted exclusively to the subject of Public Health in India. The Author ventures to trust that he will receive many valuable facts, in illustration of this important subject, from his professional brethren and other practical observers.



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## WORKS BY THE SAME AUTHOR.

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A Practical Treatise on the Management of Diseases of the Heart, and of Aortic Aneurism, with Especial Reference to the Treatment of those Diseases in India. 8vo. pp. 145. Price Rs. 5. LEPAGE AND CO. CALCUTTA, 1851.

"Dr. Chevers is an accurate observer, and his little work will prove of much service to those gentlemen who practise Medicine in India."—*The Lancet*, August 23rd, 1851.

"Although small in its dimensions, it is truly a great work.—*London Medical Gazette*, October 17th, 1851."

"We must now take our leave of Dr. Chevers, with the assurance that we have read his book with profit and pleasure, although there are many points on which we take the liberty of differing from him."—*British and Foreign Medico-Chirurgical Review*, January, 1852.

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"We must now dismiss our author, which we do with the hearty conviction that his book is one of high practical value, and deserves to be received without qualification as a text book for the treatment of the most important class of diseases of which it treats."—*Ranking's Half-Yearly Abstract of the Medical Sciences*, July to December, 1851.

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A Collection of Facts Illustrative of the Morbid Conditions of the Pulmonary Artery. 8vo. pp. 137. (double columns.) London, 1851.

"We are indebted to the same author for another meritorious treatise on the Morbid Conditions of the Pulmonary Artery, a vessel which has hitherto been considered so seldom diseased that it is barely mentioned in the standard books on Diseases of the Heart. Dr. Chevers has, however, by devoting many years to its study, clearly shewn that the opinion of the immunity of this artery from disease is far from true, and that not only is it subject to numerous congenital malformations, but also is amenable to the action of disease." *Ranking's Retrospect*,—*ut supra cit.*



























