

An examination of the statements contained in the papers relating to the fetid irrigations around the city of Edinburgh ... / [William Tait].

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AN
EXAMINATION
OF THE
STATEMENTS CONTAINED IN THE
P A P E R S
RELATING TO THE
FETID IRRIGATIONS
AROUND THE
CITY OF EDINBURGH,
BY
WILLIAM TAIT, SURGEON.

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1839.

EXAMINATION

PAPER

PHYSIOLOGY

CITY OF EDINBURGH



AN EXAMINATION, &c.

As the "Papers" relating to the Fetid Irrigations around the City of Edinburgh have now become public property, it is the prerogative of the public to examine into their nature, and see if they are calculated to effect the purpose for which they were intended. In all questions of doubt and difficulty, too much care and attention cannot be bestowed in investigating the truth; and certainly had diligence and zeal been the only essential qualities of those intrusted with the collection and arrangement of the "Papers relative to Fetid Irrigations," the documents just published would have been complete and satisfactory. In the desire, however, to manufacture a pamphlet of such size and dimensions as would show to the inhabitants of Edinburgh that they had not been idle, the "Committee of the Commissioners of Police" have collected what they call evidence from every trade and profession, from the cow-feeder to the Director-general of the Army Medical Department, and this they have arranged and published, altogether regardless of the discrepancies which occur amongst them, and without reflecting whether or not all who have contributed were individuals qualified to give impartial or legal evidence upon the subject.

The "Papers," when put together in form of a pamphlet, have assumed rather an imposing appearance, and no doubt are considered by the committee quite conclusive and incontrovertible. They are prefaced by a beautiful and clearly written "Note" from the pen of Mr Drysdale, the indefatigable chairman of the committee. The author, after going over

nearly the same grounds which he traversed on a former occasion,—detailing briefly what every body knows of the elevated situation of the city, and its natural advantages of “sewerage and drainage,” and “fine scenery and noble walks;” and how these are likely to undergo a complete change, unless the “excrementitious streams” with their nauseous contents be instantly diverted from their present course,—comes to the opinion delivered by two eminent counsel, Messrs Duncan M’Niel and Patrick Shaw. The opinion of these gentlemen is precisely such as might have been expected from any one of the talents and attainments which both are known to possess. It shows, *first*, “That although the inhabitants of Edinburgh have, on the principles of the common law, a right to divert the course of the polluted streams, in so far as they consist of the rain water which descends within the bounds of the city, and of the water brought into the city by the Water Company, yet they cannot do so, in so far as the streams are supplied from natural springs, and that they are barred from making any alteration whatever in their course by the following clause in the Police Act, “*that in making any main drain, or sewer, or conducting drain, the water at present carried into any existing outlet shall not be diverted therefrom.*” *Secondly*, they are of opinion, that the whole refuse and impurities of the city belong, by the Police Act, to the Commissioners of Police, and that were it practicable *to separate them from the water*, they might be conveyed away in different channels, or disposed of, as the Commissioners think proper. They are of opinion, *thirdly*, that assuming in point of fact, that the operations complained of are a nuisance, *it is not competent for the Commissioners of Police, in their representative capacity, to bring any action for putting a stop to them*; and then the opinion is summed up in the following sentence:—Under all the circumstances, we think that it would not be expedient to attempt to abate the nuisance by an action at law. The evil, as represented in the memorial, is of a nature so great, and so deeply affects the *public health* and the welfare of the city, as to bring it under the principles of General Police Legislation, and we are therefore of opinion, that the most effectual and the most expeditious course would be to apply to Parliament for authority, by means of drains, or otherwise, to abate the nuisance. This course is the more necessary, as the clause in the

Police Act mentioning the present course of the water, and prohibiting it from being diverted, would be a formidable obstacle in attempting to obtain relief, either by an application for interdict or other proceeding, in a court of law." This opinion may be considered important and satisfactory, in so far as it points out the legal steps which can be adopted, and the incapacity of the Police Commissioners to do any thing as a body to abate the nuisance complained of, but, as the latter part of it is founded on the assumption that "the public health and welfare of the city" is affected by it, the Commissioners are as much in a quandary as before they obtained it. If it can be shewn that these "Fetid Irrigations are not in the least prejudicial to the health of the inhabitants around them; and that instead of affecting the "welfare" of the city, they are a benefit to it, in as much as they are the means of a constant and plentiful supply of dairy produce for its inhabitants, the opinion of the "two eminent counsel" for which the city has paid, is of very little importance. The wayward Commissioners and eminent counsel, however, never dream of such possibilities. They think that the weighty evidence of Doctors, Ministers, Military Officers, Writers, Bailies, House-Governors, Inspectors of Police, Rail-road Managers, and Station-keepers, and Cowfeeders, supported by "Al Hakim," leave no doubt on this point. Presuming that such is the case, the chairman of the committee goes on to inquire, as to the parties that should bring forward a bill; whether it should be the overtaxed inhabitants of Edinburgh willing to submit to another additional burden being imposed upon them, or the Officers of the Crown. The latter, he considers to be the proper parties, provided they be found so gullible as to swallow, without further inquiry, the crude mass of evidence which he has compounded for them. The chairman concludes his observations, by pointing out the objects which such legislative enactment ought to have in view, but these it is unnecessary to quote, as they are founded on the opinion of the learned counsel already alluded to.

The introductory note is followed by a few extracts from "The Cyclopædia of Practical Medicine," and from the Dictionary of Practical Medicine by Dr Copland, on the definition, nature, and effects of marsh effluvia, or miasm, which we shall have occasion to show in our subsequent obser-

vations, are quite irrelevant. The second head contains four letters from "Al Hakim," which were originally published in the Caledonian Mercury, descriptive of the Fetid Irrigations round the city, and their effects upon the health of the inhabitants. The third division comprehends what is called the "Medical Evidence relative to the noxious effects of the Irrigated Lands upon the inhabitants of Edinburgh and its neighbourhood." It surprised us much on reading this part, that the names of the *elite* of the profession did not figure in its pages. With one or two exceptions, no local practitioner of eminence or experience has given a certificate on the subject. Is this because they were not applied to? We suspect not. Is it possible, that out of 270 respectable medical practitioners in Edinburgh and Leith, only about a dozen would hazard a conjecture as to the injurious influence which these Fetid Irrigations "have on the health of the inhabitants of the city?" It is solely, we imagine, because a great majority of the medical gentlemen conscientiously believe that they are not injurious, or because they are not in possession of a sufficient number of facts to warrant them to say so. The present and prospective injury which Edinburgh, as a place of residence, is likely to sustain from the Fetid Irrigation, is also considered under this division. The *fourth* part contains the "miscellaneous evidence relative to the injurious influence of the Irrigated Lands," on man, horses, cows, milk, and butter! The "Papers" are concluded with the Report of the Poor-law Commissioners of England on the physical causes of disease in the metropolis.

In a review of the opinions contained in the "Papers," it would be an unnecessary waste of time and paper to examine into the merits of each as they are successively presented to our notice; we shall therefore arrange them in the following order, and consider,—

1st, Those which have a reference to marsh miasm, or malaria, and its effects.

2d, Those which affirm that the Fetid Irrigations are absolutely injurious to the health of the inhabitants of Edinburgh.

3d, Those which more especially refer to the Fetid Irrigations as a nuisance, and to the physical changes which they are said to produce on meat, butter, milk, &c. &c.

As the whole observations contained in the "Papers" on Fetid Irrigation seem to depend chiefly on this creature of the imagination marsh miasm, it is introduced first in order, to give precision to the whole question under consideration. The weight and importance of the whole fabric may easily be conceived from its spectral foundation. Its "existence," says the quotation introduced from the Cyclopædia "is *inferred* from its *effects* on the animal economy;" "and we trace its origin to *marshes*, from its having been observed, for a series of ages, that such *effects* are produced *only* in the vicinity of marshes. Besides its usual effects, the Cyclopædia of Practical Medicine and Dictionary of Practical Medicine, are quoted to shew that almost all diseases are produced by it, and amongst the others, "*Idiocy*," which, if true, explains at once the true source of the present agitation and expenditure of the public money. "Al Hakim," whose erudition carries him back to 600 years B. C., ventures a tilt also with this pestiferous monster, Marsh Effluvia, and after mingling him up with Sulphureted Hydrogen and other gases, "as if nature had seen the necessity of associating it with an intolerable stench, in order to warn animals of its proximity," makes it truly a gigantic enemy of the human race. Having thus created a poison to his mind, he endeavours, *first*, to consider its general effects on health; *secondly*, in what manner Edinburgh can be effected by its influence. Indeed, so easily is he satisfied of the existence of marsh miasm, that the mere creation and continuance of artificial marshes round the City of Edinburgh would be sufficient *a priori* to convince him of an increased unhealthiness and mortality among its population. Unlike the editors of the Cyclopædia of P. Medicine, he does not require to *infer* its *existence* from certain effects produced by it on the animal economy. With his instinctive powers of perception, it need not surprise us, that he pays little attention to the *fact*, whether or not there is the least proof of its existence; and being thus easily satisfied, it is quite consistent

with his shallow mode of thinking, to proceed to a description of its effects, and to show in what manner Edinburgh is affected with it. In his anxiety to do justice to the subject, and make it intelligible to his readers, he proceeds to describe the symptoms and stages of Intermittent Fever, "in order to show how fatal must be the influence of marshes on public salubrity." This kind of instruction will certainly be beneficial to those surrounding the marshes, as we can say pretty confidently, that few of this generation have witnessed these symptoms, and must look upon them as something new and curious. Nor are the effects of Intermittent Fever limited to the disease itself, but "it lays the foundation of chronic disease, and gives sad and lingering experience of a *living death*," and shortens the "term of natural life;" "the inhabitants appear sallow, weak, and listless." "Such are the effects of simple vegetable decomposition, and the influence of marshes on public health." On the principles of reasoning, which "Al Hakim" has adopted, we may infer that all these symptoms and diseased appearances being awanting, no vegetable decomposition or marsh miasm does exist. It is needless to follow "Al" in all his imaginary currents and fanciful "funnels," to show how the wind carries the effluvia into the city; suffice it to say, with Mr Liston, that "no city, certainly, is more advantageously placed to secure perfect ventilation" than Edinburgh. As none of the medical certificates contained in the "Papers, &c." seem to insist particularly upon a similarity between the miasm of the Irrigated Lands and those of natural marshes, we may consider "Al Hakim's" opinion of very little value.

In order to obviate a mistake into which the non-professional reader is very apt to fall, we may state once for all, that nothing certain is known of the true nature or origin of this bug-bear marsh miasm. Its appearance, its physical and chemical properties have never been detected. It is indeed probable, that the effects imputed to it, may at no distant day be referrible to some other cause. Being thus in total ignorance of its real nature, it is not surprising that medical men themselves should differ in opinion regarding it. And, accordingly, different theories have at different times been advanced by eminent professional men in order to explain the effects produced by it. Some authors, for example, seek for an explanation of it in the decomposition of vegetable matter alone,—others refer it to the

same cause in combination with heat and moisture,—others again to moisture with cold east winds,—whilst others, such as Dr Copland, imagine it to be of a very peculiar nature, capable of being buried for centuries and exhumed at pleasure, a supposed proof of which lately happened in London. Men equally eminent have shown that moisture, though generally present where its effects are manifested, is not absolutely necessary for its production. Dr Ferguson has more especially directed the attention of the profession to this fact, and pointed out instances where the directly opposite conditions gave rise to the effects generally referrible to marsh miasm. It is also shown by the “Statistical Report on the Sickness, Mortality, and Invaliding of troops in the Mediterranean,” that at Malta and the Ionian Islands, stations where, from the porous nature of the soil, from the absence of forests and rank vegetation, and marshes of every description, no Marsh Fever could have been expected, Intermittent and Remittent Fevers were equally as prevalent as at any other station in the Mediterranean where marshes abounded. In the Mauritius, where both rank vegetation and marshes are combined with a high temperature, fevers have neither been so prevalent nor so fatal as at Malta. In the former, for example, only 13 cases of Intermittent, and 7 cases of Remittent Fever occurred in 19 years among the troops out of an aggregate strength of 30,515, while in the latter, during 20 years, out of about a sixth part of the number of troops, there have been 311 cases of Intermittent, and 384 cases of Remittent Fever. Dr Hopkins, the latest and most scientific writer upon the subject, shows from hygrometrical observations, that diseases, said to arise from it, are in exact proportion to the state of the dew point, or moisture of the atmosphere. A secretion of diseased vegetables is said by some also to be a cause, and probably is the most feasible of the whole; for, as it is an established fact that the secretions of a person in a state of disease are prejudicial to health, so, altogether independent of facts to prove it, it is not unreasonable to suppose that the secretions of plants in a similar state will also be unhealthy. Amongst this diversity of opinions, which are we to adopt? As the question relating to miasm is still problematical, and as none of its usual effects, Intermittent and Remittent Fevers, are found to exist in the neighbourhood of the Irrigated Lands, we hold it unjust and unphilosophical on the part

of those who insist upon its existence, to bring it so conspicuously forward in the discussion of the present question.

The remarks of "Al Hakim," in regard to the pernicious influence of the gases arising from the decomposition of the "organic *debris* daily poured out of the city," are equally inappropriate. Though each of the gases alluded to may be of a more or less poisonous nature when in a concentrated state, the probability is, that by entering into new combinations, or becoming diluted with the atmosphere, they are rendered quite innocuous. The chemical condition of the atmosphere of large towns is acknowledged not to differ from that of the country. Add to this the important fact, that hitherto we have no proof that any individual has ever been observed labouring under the effects which these poisonous gases are said to produce, and certainly we may affirm, that no proof has yet been discovered of their poisonous tendency. All the effects said to be produced by the odours arising from the Irrigated Meadows, such as shivering, fainting, nausea, &c., are probably the result of an impression communicated through the medium of the senses to the mind; and not the consequence of any primary physical impression produced on any of the organs of the body; in the same manner as any unseemly or loathsome object produces a sort of shivering, nausea, and uneasiness, sometimes amounting to vomiting, and fainting, in the individual who looks upon it. This is not the proper place to inquire whether or not these moral impressions do ultimately lead to any morbid alteration in any of the organs of the body, as it will be shown afterwards, that individuals so easily affected are very rare, and that the atmosphere, even when loaded to excess with the odours of decaying and putrifying bodies, is not only not hurtful to health, but apparently beneficial to it. This will be more particularly considered when we come to an examination of the grounds on which the medical gentlemen have formed their opinions.

II.

Are Fetid Irrigations absolutely Injurious to Health?—Were the opinions contained in the Papers on Feted Irrigations satisfactory evidence on this subject, we ought at once to answer it in the affirmative. But as most of these appear to have been inconsiderately expressed and advanced for a certain purpose, and, with one or two exceptions, none of them grounded on facts, we must consider them of very little value, and far from giving “precision to the question under consideration.” Indeed, after perusing them, we never felt more inclined to yield our assent to an expression of the editor of the British and Foreign Medical Review, to the following effect, “that it may appear ungracious to say, what is nevertheless strictly true, that the opinions of medical witnesses are little to be relied upon, and that their general authority is unworthy of confidence,” and that “strong assertions, resting on unstable doctrines, may there be found in abundance; but of careful observation, and wise experience, there are few traces.”

In order that the subject under consideration may be more clearly illustrated, we shall *first* examine the nature and importance of the evidence adduced in the “Papers on Fetid Irrigations,” and see whether or not they are calculated to prove the insalubrity of the district alluded to; and, *secondly*, inquire whether the statements contained in them, regarding the prejudicial effects which the fetid odours have on the health of the community, are in harmony with what is already known on this subject.

In our remarks on the first of these, we must distinguish between those who state positively that these marshes are injurious to the health of the inhabitants in their neighbourhood, and those who cannot from experience declare them to be unhealthy, but give it as their opinion (principally founded on the nature of the effluvia arising from them) that they cannot be beneficial to health. Under the former we include Messrs Liston, and Imrie, Surgeons; Mr Smith, Governor of the House of Refuge; Drs Huie, and Balfour; and under the latter, Drs Traill, Fyfe, D.

B. Reid, S. Alison, Mackenzie, J. H. Peebles, Sir George Ballingall, and Dr Abercrombie, The medical evidence on the trial, *Duncan v. the Earl of Moray*, is also of the latter description, as it was considered by the Court at the time of the trial, insufficient to prove the question in dispute. Mr Liston says, he has been long convinced, that this (the irrigation of the low grounds and meadows around Edinburgh) was a fruitful source of the fevers of various kinds, Typhus, Erysipelas, &c. The only ground he gives of his conviction, is the occurrence of eight cases of Erysipelas amongst the dragoons stationed at Piershill Barracks, "on the very day following that on which the sluices were opened," for the purpose of irrigation. It is a pity he has not stated the precise period when these cases occurred, for on perusing the Statistical Report on the sickness, mortality, &c. of the Troops of the United Kingdom, we find no particular allusion made to this important fact. In 1832 we find the greatest number of cases of Erysipelas recorded during the seven years from 1830 to 1837, and they only amounted to about 5 per 1000 of strength, and we presume, that not more than 500 were quartered at Piershill, leaving their proportion to be about 2 or 3 cases during the year, and in these reports we find nothing to warrant a belief, that during any one of these seven years "a considerable number of men, and two or three officers, were destroyed by the disease." Such an occurrence might possibly have taken place before that period, but as such an event is upon the whole very rare at Piershill, it might have been occasioned at the period alluded to by some other cause than that to which it was attributed, supposing it ever took place. Were the effluvia, or any thing else arising from the Irrigated Meadows the cause of it, it ought to be of much more frequent occurrence. And, moreover, the suddenness of the attacks "the very day" after the opening of the sluices, is sufficient to excite a doubt in our mind regarding its origin. It appears to be more virulent in its nature than the most deadly poison, for who before ever witnessed a person "previously perfectly healthy" have an alarming Erysipelas in the course of one day? In the most rapid and fatal form of that disease, that which is caused by punctures received during dissection, several days elapse, during which the patient experiences considerable uneasiness, shiverings, and other febrile symptoms, before the inflammation of the skin makes its appear-

ance; and in the very simplest form, general depression and weakness is generally experienced for some time before the disease is observed. It is further obvious, that had these cases of Erysipelas been caused by the Irrigated Lands in question, many others must have been exposed to their noxious influence. It is not probable that the morbid influence of these lands would have been so partial in its effects as pass over the inhabitants of Restalrig and Jock's Lodge, already, if we can believe the testimony of other witnesses, ripened for its attack, and vent its rage on the youthful and athletic soldier. As Mr Liston does not say that he has seen the "fevers of various kinds, Typhus, &c.," which are caused by these marshes, we may suppose they only originated in his imagination, and consequently require no notice as matter of fact.

How any medical man, and more especially a talented and reflective man like Dr Huie, could at once, without a shadow of proof, save two cases of fever, declare any place unhealthy, appears to us altogether incomprehensible. Take every village from Lands end to John o'Groat's, and it will be found that at one period or other it has been visited by epidemic fever, and that some of the cases have taken the very worst forms, perhaps even resembled the acute fevers of various countries. The very worst cases of Typhus Fever we ever witnessed occurred in a country village, in every respect favourably situated in regard to soil and elevation, and the experience of every country practitioner could bear testimony to similar facts; and if such is the case, we see no reason why the inhabitants of the Caledonian Dairy at Meadowbank should be exempt from it. Unless Dr Huie is prepared to show that fever occurred frequently at that place, we should doubt much if he will be able to establish his position that the Irrigated Meadows are unhealthy. His remarks on foul air will come more appropriately under consideration when we come to speak of the opinions expressed by those gentlemen who do not speak as to facts of sickness having occurred in the vicinity of the marshes. Granting that the observations of Mr Smith were correct regarding the number of cases of fever which occurred in the Refuge, we would consider it an unfair inference to say that the fever was caused by the marshes. The circumstances of all the inmates of that Institution

are such as to predispose them to every kind of disease. Destitute of food and clothing—dissipated in habits—their constitutions broken up by mental anxiety and bodily sufferings, it need not be surprising that they are seized, and even carried off by fever. Mr Smith has carefully avoided recording the number of those who came into the Refuge labouring under the disease. This appears like a studied attempt to exaggerate and distort the truth. We were much surprised to see that Mr Smith's report was preferred to that of the respectable medical attendant, Dr Fairbairn. We would have more fully examined into all the circumstances connected with the fever which occurred in the Refuge, had Mr Smith himself not stated sufficient to convince us that the fever was not caused by the Irrigated Lands. "During a period of six months, (says Mr Smith) from October 1837 to April 1838, about 120 cases of fever occurred among the inmates of the House of Refuge." It must be obvious to every unprejudiced mind, that these cases of fever could not possibly be caused by the irrigation, for it so happened that they all occurred during the six months of the year when no irrigation was carried on.

The same remarks which have been applied to the cases of Mr Smith, apply also to the 137 cases said to have been attended by Mr Imrie, all which occurred between 1st September 1838, and 1st March 1839. But as Mr Imrie's observations are "highly valuable from their direct bearing on the question," and from his having "lived and practised in the very vicinity" of the marshes, we must examine his testimony a little more carefully. The locality where these cases occurred, is said to be the Canongate, the North and South Back of Canongate, with closes and wynds leading to and from these streets; Abbey, Abbeyhill, Croft-an-righ, Norton Place, Comely Green, Jock's Lodge, and Restalrig. With two exceptions, all these places were personally visited by us on a former occasion, and we could not, from careful inquiry, learn of more than 96 cases, and 6 of these we found, on inquiry at the medical attendants, to be very doubtful, being rather cases of bronchitis reducing them thereby to 90, which is little more than two-thirds of Mr Imrie's number. But it is possible that Mr Imrie has included, all the cases of sickness which he attended, under his class "fevers." He says

in one part of his report, that two-thirds of the cases occurred during the months of October, November, and December; and, mark it, that *nearly the same proportion of them had affections of the chest, bronchitis, pleuritis, or pneumonia.* Thus, there remains then only one-third of the 137 cases to be idiopathic, epidemic, or uncomplicated cases of fever. But even this number is considerably curtailed in the next paragraph, for he says, "Nearly one-fifth of these cases exhibited all the worst symptoms of Typhus Fever." "The remaining four-fifths were comparatively mild cases of fever," leaving us still in doubt whether the "one-fifth of these" refers to the whole cases—the two-thirds, or the one-third; but giving him the benefit of the whole, it shows that only about 25 cases of fever came under his observation, which we consider very near the truth. During the epidemic alluded to, almost all cases of fever took the Typhoid appearance, so that if Mr Imrie contends for a greater number than the one-fifth of what he has stated as fever cases, it would argue much for the salubrity of the neighbourhood where the cases occurred. His remarks on the particular locality where fever was most prevalent, are also very indistinctly expressed, and by no means calculated to convey the truth. "The greatest number of cases," he observes, "in proportion to the population, occurred betwixt Little Lochend's Close, Canon-gate, and Croft-an-righ Wynd, Abbey-hill. The number of cases at Restalrig was nearly as great. The worst cases were in these two localities." By this, the reader would infer, that Restalrig, the healthiest village in the Lothians, had for once been the seat of a raging epidemic; that death and devastation stalked from house to house; and that its beautiful and ancient burial ground gave awful manifestation of the havoc produced by the direful pestilence. Yet, notwithstanding, that the *worst cases* were in this locality, no evidence was afforded of its mighty deeds. Like the Cholera, which went before it, fever passed by without slaying a single victim. Death, which is the best proof of the severity of any disease, being wanting, how is Mr Imrie warranted in asserting that the worst cases occurred at Restalrig? It may be mentioned that fever did affect a family at Restalrig, but the cases were not of a very aggravated nature, and the circumstances attending them will at once

point out the source whence fever originated. The father, two sons, a daughter, and a woman who waited upon them during the disease, were successively attacked by it. It never spread, however, to any of the neighbouring houses. The individual and his sons were in the employment of a friend on the Easter Road, who keeps a kitchen garden, and several members of whose family were affected with fever. Both he and his sons were in the daily habit of calling upon and inquiring after their friends, and were even admitted into the apartment where those labouring under fever were confined. The result of which was, that the old man and one of his sons soon contracted the disease, and came home to Restalrig, where the others ultimately became affected with it. Had Mr Imrie explained these circumstances, it would have been unnecessary to impute its origin to the Fetid Irrigations. Neither have the cases been so numerous and so fatal as we would be led to believe, nor to warrant Mr Imrie in saying that the cases were most numerous in proportion to the population at Restalrig, and betwixt Lochend's Close and Croft-an-righ. The number of families residing at Restalrig are not so numerous as to lead to a fair inference, but let the population of Jock's Lodge Comely Green, and Lochend be included, and we will find that the number of cases of fever in proportion to the population is less than many other districts within the city. This will be shown in a subsequent part of our observations, where a table will be introduced to show the number of fever patients brought to the Infirmary from the different parts of the city. We will be sorry if our old and intimate friend, Mr Imrie, take offence at any thing we have said. These remarks are not made with the intention of giving offence, but with a desire, if possible, to discover the truth, and turn it to the advantage of the public.

The letter of Dr Balfour, which contains his opinion and experience, is not of so much importance in proving the insalubrity of the Irrigated Ground at the foot of Salisbury Crags, as the remarks of Dr Abercrombie would lead us to suppose. The fact of several of his father's family having had attacks of an intermittent nature, which yielded to the

use of bark, proves very little.* We dare say Dr Balfour has seen a similar circumstance before, where no suspicion was entertained of its having been caused by emanations from the Irrigated Meadows; if he has not, we can inform him, that cases of this description are by no means rare, both in Town and Country in young people, during the Spring months, and especially if the wind blows from the east. In the army, where all the soldiers are in the prime of life, about 99 out of the 100 are in the hospital once a year, so we are not surprised that Dr Balfour should visit about a fifth-part of those inhabiting St. John's Hill, while we consider that medical men are frequently called in, simply to sign a line for the Destitute Sick Society, and where physic, though prescribed, is never taken. Unless he is prepared to show that the inhabitants of St. John's Hill are more unhealthy than those of a like rank and condition inhabiting some other district of the town (to say nothing at all about the supposed influence which the Tan Works, in the neighbourhood, may be said to have on the health of the inhabitants), his remarks prove nothing on the question in dispute. The sickness, moreover, caused by these marshes, ought not to be confined to St. John's Hill, but must be expected everywhere in their vicinity. Now, from experience, we are prepared to state that a more happy or healthy population no where exists in nor about Edinburgh than those inhabiting the lands of houses extending from St. John's Hill to the Abbey and forming as it were, a barricade to prevent the pestiferous

* The statements of Dr Balfour may be considerably modified, by giving the following facts, taken from a declaration of his father:—Previous to Mr Balfour's removal to his present residence in St. John's Hill, he inhabited a house in Gilmour Place, near Lochrin. While living there, his children were very subject to Infantile Remittent Fever, and continued to be so for some years after his removal to St. John's Hill, till such time as they grew up; after which they enjoyed good health. It is now 14 years since any of these Remittent attacks were observed in his family. Having had the disease in the family before a removal to another abode, it is unfair to conclude, that it was owing to any particular circumstances affecting the new locality, different from those affecting the other. Had no sickness been experienced in the family previously, it is quite possible there might be some cause for it in the change, although it would be difficult to prove that it was caused by the Fetid Irrigations in the neighbourhood.

miasm from entering the city. If the effects of miasm are to be experienced at all, it must surely be amongst those most exposed to its influence ; and if they escape, we ought to be cautious in attributing to the same cause the diseases prevalent in other, and often distant, parts of the town.

Having thus examined briefly into the nature and importance of the facts contained in the " Papers on Fetid Irrigation," we shall, *secondly*, go on to consider the grounds on which the majority of the medical gentlemen have formed their opinions. These are as follow, 1st, That the " debris" carried out by the sewerage of the city is, as it were, accumulated in certain parts appointed for the purpose, and subsequently spread over a large extent of surface, which, by being exposed to the influence of the sun and air, imparts to the latter, some of its poisonous properties ; 2d, That this effluvia, or malaria, being of a highly poisonous nature, contaminates the atmosphere to such a degree, that it becomes unfit for respiration, or produces certain changes in the nervous or vascular system of the body which are considered unhealthy ; 3d, That the smallness of the quantity " dissolved by the air is no objection to its influence," for the smallest particle is sure ultimately to lead on to diseased action ; and, 4th, In confirmation of these points, " fever appears to have occurred periodically" in the districts subjected to their influence. Drs Fyfe, Reid, S. Alison, Huie, the late Dr Hennen, and " Al Hakim," seem particularly to insist on these points. Dr Fyfe arrives at this conclusion, from what is well known, that foul stagnant water is constantly giving off effluvia, which he conceives must affect the salubrity of the neighbourhood. Dr Reid, because, " An immense extent of surface is covered with putrescent animal and vegetable matter ;" and that this is communicated to the air, and produces on the human system " an impression so offensive as to be accompanied with a kind of shivering," and that although people exposed to it live long lives and enjoy excellent health, it must be unhealthy. Dr Alison, because, " The atmosphere over and about the Irrigated Lands in the neighbourhood, when loaded with the noxious emanations, is *known* to produce, even by very temporary action, immediate deviations from health." And, Dr Huie, because, " If pure

air be necessary to the health and comfort of our species, and no axiom is more trite, surely foul air must be injurious to both." Such are a specimen of the different ways by which individuals of talent and reputation arrive at the same conclusion. It can be explained only on the supposition, that all came to the conclusion *first*, and bethought themselves *afterwards*, how they could best support it. It must be admitted that there is something exceedingly disagreeable and offensive in the emanations from these meadows to which their remarks refer, but it does not follow that every thing offensive to our senses is detrimental to our bodies; on the contrary, these very eminent individuals themselves must be aware that many substances in nature, offensive alike to smell and taste, exert a beneficial influence over the human constitution. The atmosphere itself is a compound of different gases, some of them in a concentrated state, highly poisonous, yet when combined in certain proportions, can be inhaled without producing the smallest bad effect. Is it not possible, therefore, that certain gases and odours emanating from these lands, may be mingled in such nice proportions with the atmosphere, so as to render it beneficial rather than prejudicial to health? This is a question that can only be solved by experience, and as Restalrig has been notorious for its salubrity,—a village, situated too, on the very common sewer of Edinburgh, we must candidly acknowledge, that experience seems to speak in its favour. There is a difficulty which meets us in these investigations, which no acquaintance with physical or chemical science will enable us to overcome, viz. that of determining in what precise proportions the gases which are said to emanate from the meadow lands render the atmosphere unfit for healthy respiration. From facts which will be immediately stated, it will be observed that the atmosphere may be very highly charged with odours from putrifying bodies, and the decomposition of "organic debris," and yet not prove in the least injurious to animal life. Before doing so, however, it may be well to point out a mistake into which most of the gentlemen, alluded to in the report, seem unconsciously to have fallen. There is no analogy whatever between the condition of these Irrigated Lands and the filthy stagnant pools to which they constantly allude, and to which the Report of the Poor's Law Commissioners particularly refers. The lands, before they can be rendered valuable by irri-

gation, must be either of a porous state naturally, or thoroughly drained, so that the water may immediately be carried off the surface. Whenever the water stagnates, the crop is completely destroyed. Admitting that the surface of the meadows is frequently refreshed and moistened, the luxuriant and healthy crop with which it is clothed must retain a considerable part of the effluvia, and give it out so gradually as not greatly to affect the atmosphere, and the latter, by its perpetual current, must always prevent any thing like a stagnation of effluvia.

In contrast to the opinions alluded to, we will now turn our attention shortly to the opinion of those the extent of whose opportunities renders them in every respect qualified to give judgment in any case where the health is said to be affected by the odours or effluvia arising from the decomposition of animal or vegetable matter. A report, similar to the one at present agitated in this city, was at one time urged against the dissecting-rooms in Paris, which were imagined to be the "foci" of infectious emanation. When it is mentioned that these apartments were generally small—that from 1000 to 1400 dead bodies were annually dissected in some of them—that the rooms were seldom cleaned, and even the "*débris*" of the bodies was not removed oftener than once a month, and that nothing could exceed the abominable stench which was diffused over the immediate neighbourhood, it could scarcely be expected that any one would have the hardihood to affirm, that they were not injurious to the health of the community. Yet, Duchatelet, the greatest and best authority on any question connected with public hygiene, has satisfied himself that there is *not a shadow of truth in the statement*; and in confirmation of this, he appeals, with confidence, to the healthy state of the Hotel Dieu in former years, when this hospital was surrounded with numerous dissecting rooms, some of which were even within its walls. M. Lallemand has also observed that he never heard of any disease that had occurred among the Students themselves, or the inhabitants of the adjoining houses, that could be attributable to the presence of the dissecting rooms; and Desault used to say, *that he really believed that the odorous air of his dissecting-rooms saved him from the attacks of epidemic and other disorders*, to which others appeared more susceptible than

himself. Dubois, Dupuytren, Boyer, and Andral, have all given testimony to the same effect; and we venture to say, that not a single lecturer on anatomy in Great Britain nor Ireland, will vary in their opinion regarding the salubrity of these receptacles of filth and stench. "I have taken the trouble," says Andral, "to ascertain the general health of the servants of the Amphitheatres, and some of them pass day after day there, without once going out, and it appears that *they are quite as healthy in every respect as other men.*" It is farther affirmed by Duchatelet, that these servants are "*singularly exempt from febrile diseases.*" M. Rousseau, who has been the superintendent of the anatomical preparations at the Jardine des Plantes, has also stated, that *neither he nor any of his assistants has ever suffered from their occupations, even during summer*, although the bodies of the animals dissected there are often excessively putrid. In connection with this subject, the following fact may also be mentioned. After the three glorious days in Paris, 43 dead bodies were collected together under the portico of the church of St. Eustache, when it was resolved that they should be deposited in the vaults underneath. Several weeks, after the air of the church and neighbourhood became so offensive, that the government found it necessary to refer the matter to the council of health for advice as to the steps which should be adopted in order to remedy the nuisance. M. Labarraque, M. Andral, and Duchatelet, were appointed a committee to ascertain particulars, and suggest what should be done. They agreed to remove them at all hazards; and for this purpose, after taking some preliminary precautions, as washing themselves with a solution of the chloruret, M. Duchatelet and one or two workmen descended through an opening made in the floor of the church into the vault. They wrapped the dead bodies, some of them already very putrid, in separate pieces of coarse canvass, steeped in the chloruret, and hoisted them up into the church. Two hours were spent in this disagreeable operation, and *not a single person engaged in it complained even of temporary inconvenience.*

These facts are important, in so far as they shew that the atmosphere may even be saturated with the effluvia arising from the decomposition of animal matter, and yet produce no evident derangement in the func-

tions of the living body. If no bad effect is produced in the stagnant atmosphere of a small, crowded, and ill-ventilated dissecting-room, it certainly would be absurd and unphilosophical to conclude, that it was prejudicial to health when diluted with the free and flitting air, till scarcely a single trace of its offensiveness remained.

The facts to which we intend next to refer, are better calculated to illustrate the present subject. About a mile from the north-east extremity of Paris, at Montfaçon, almost the whole ordure from the "fosses d'aisance" of that large and populous city, is collected together, and piled up till it undergoes a sort of fermentation, and becomes solid and dry enough to be exported, or driven away for agricultural purposes. Besides this, there is also in the same neighbourhood "that incomparable stable of filth and nastiness, the enormous slaughterhouse at Montfaçon, where between 12 and 13,000 horses are killed annually;" and where also are the abodes of those employed in the disgusting occupation of making music strings, from the intestines of animals. The blood which escapes from the slaughtered animals, is allowed to flow on the ground, into which it soaks, forming a compost of disgusting fetor; the flesh is separated from the bones, and sold as food for dogs, pigs, cats, and man! The viscera, with their contents, are thrown together in large masses, and the carcasses are carried off to a place appropriated for them; and the bones, after being completely stripped, are chiefly consumed in the manufacture of ammonia and animal charcoal. In this abominable situation, where so many disgusting occupations are carried on, and where the effluvia is almost intolerable, we must surely find the inhabitants "weak, languid, sallow," bowed down under a premature old age, and giving "sad and lingering experience of a *living death*." But, no—"we are told," says the Medico-Chirurgical Review "of the '*santé la plus florissante*' of the men; the '*santé brillante*' and the '*fécondité remarquable*' of the women; and the '*force et mine admirables*' of the infants, who are sometimes cradled '*dans l'intérieur d'une carcasse, comme dans un berceau*!" The same holds true of the manufacturers of gut strings, and of the tanners, and of their families; *they are in general remarkably healthy*. What is especially worthy of notice, is,

that the men very seldom suffer any inconvenience from wounding themselves while engaged in their operations. The wounds, it seems, heal quickly; and it is rare that any case of carbuncle, or of the 'pustula maligna' occurs. "We shall mention," says M. D. "only one other circumstance in reference to the health of the workmen in the 'chantiers;'" and that is, the remarkable exemption from illness which they enjoyed during the destructive prevalence of the Cholera in Paris. There were far fewer patients admitted into the Hospital St. Louis, which is situated in the district of the 'chantiers,' than into any other hospital of the metropolis." The Amelot sewer, one of the largest that flows beneath the Parisian capital, had, from long neglect, become completely obstructed, and the cellars, houses, and streets in its neighbourhood were subjected to an obscene inundation. Workmen were employed under the superintendence and direction of Duchatelet, who succeeded in removing from the Amelot sewer, and its branches, 2150 cart-loads of solid matter, and thrice the quantity in a soft or semi-liquid state. Six months were spent in this disgusting employment, and at the end of the task, *the workmen were all in perfect health.* Is there any thing then in the constitution or habits of the inhabitants of Edinburgh, to render them more susceptible of disease than those just alluded to in Paris? We suspect not. What is applicable to the one, is also applicable to the other. The workmen engaged in the tan works in Edinburgh are equally as healthy as those in Paris. There is not a more robust and healthy family in any city in the world than that of Mr Kohler, the manufacturer of music strings in this city, although they constantly live in an atmosphere highly impregnated with putrid effluvia. There is this remarkable coincidence also connected with the premises of Mr Kohler, that no case of Cholera occurred within a considerable distance around them during all the period it raged as an epidemic in Edinburgh, and cases of fever in that neighbourhood are also very rare in comparison with what might have been expected amongst so poor and wretched a population.

No where could we expect diseases of any kind, and more especially fevers, to be more prevalent, than in and around those Augean stables

of filth and nastiness, situated between the back of the Castle and West Port. It cannot be asserted, that it can vie in comparison with the unparalleled Montfauçon, but, besides the dirty operations usual in a tannery, we have here, in the centre of Modern Athens, a regular dung manufactory, with dung tanks of goodly dimensions, in a state of perpetual fermentation, and constantly imparting to the atmosphere volumes of offensive odours; yet we have no proof that this locality is more unhealthy than any other district in Edinburgh. From a careful perusal of the records of the Fever Board, we are prepared to state, that fewer cases of fever have occurred there in proportion to the population, than any other part of the Grassmarket. In fact, during the last three years, more cases of fever have occurred in Blackfriars' Wynd, High Street, alone, than in all the West Port, and the dwellings around the tan works alluded to, although the population of the latter is six times greater than the former. The difference in the circumstances of the inhabitants of these two districts may be supposed to account for the greater amount of fever in the one than in the other, but this is not the case, as the destitution of the one class of inhabitants is equally as great as the other—the habits of both are alike—and the condition of their dwellings very similar.

With such important facts before us as those to which we have just adverted,—facts which almost prove to a demonstration that the effluvia, odours, or miasm arising from the decomposition of animal matter, even when in a very concentrated state, and forming as it were a large proportion of the air which is breathed, are perfectly harmless—what are we to think of the opinions contained in the “Papers on Fetid Irrigations” that are entirely founded on their poisonous nature, or the supposed pernicious influence which they are said to have on health? Previous to the publication of Duchatelet's Researches, such opinions were very generally entertained; but now, with the light he has thrown on a somewhat doubtful and mysterious subject, we little expected that any one acquainted with the facts he has disclosed, would again have ventured to make such vague and unqualified assertions as those contained in the “Papers on Fetid Irrigations.” The alleged facts so often made use of, that water

in which kemp and flax have been immersed, are highly prejudicial to health, has been completely refuted. This opinion Duchatelet has come to after two years investigation, and numerous experiments performed upon the subject. These experiments, it may be remarked, were extended to himself, his wife, and his family, who, as well as others, drank flax water, and slept in rooms with damp flax, &c. *with perfect impunity.*

We do not know where Dr D. B. Reid obtained his information regarding the periodical occurrence of fever in certain districts subjected to the influence of the miasm arising from the marshes, for notwithstanding diligent inquiry at different individuals long resident in the vicinity of the marshes, and a careful search into the records of the Fever Board, we have hitherto failed in satisfying ourselves of the truth of his statements. It appears from the table to be afterwards introduced, that fever is not confined to any particular locality in Edinburgh, with this exception, that it is generally most prevalent where the inhabitants are poorest; and if one place be more exempt from it than another, it is the South Back of Canongate and St. Ann's Yards, both in the immediate neighbourhood of the Irrigated Lands at the foot of Salisbury Crags. The facts which have come before us would also warrant us in protesting most firmly against this assertion, viz. that the smallness of the quantity of the effluvia or miasm "dissolved by the air, is no objection to its influence." This, if true, would be in direct opposition to a general law of nature, that the effects of any chemical or physical agent is in direct proportion to its power or its state of concentration. The effluvia of these lands, if prejudicial to health, must produce most effect upon those in nearest contact with them, and their effects must become less and less apparent as the distance from the place of their origin increases, until they become totally inert. It is no argument in Dr Reid's favour, that he was one among others who suffered from inspiring some poisonous gas mixed with a certain portion of atmospheric air. Had it been combined with double the volume of air, it is probable that neither he nor any of the others would have experienced any bad effects from it. Because an individual may be poisoned by swallowing an ounce of Laudanum, it

does not follow that one drop will produce any bad or deleterious effect. But between the highly poisonous gas to which he alludes, and the effluvia arising from the decomposition of animal and vegetable matter, there is no analogy. The one is known from its uniform effects to be hurtful to life when inspired,—the other has been shown to be comparatively harmless; they are totally different in their nature, and as different in their effects. Dr Reid, however, goes on the supposition, that its effects on the constitution are so slow and gradual, that they do not for some time become apparent, but that it must tend to injure the health of the population; he and Dr S. Alison of Tranent differing in opinion from the others (even from himself) on their side of the question, who contend that it is no argument against the insalubrity of these Irrigated Lands, that individuals, long resident in their neighbourhood, live long and enjoy good health, that they become inured to its effects, while strangers would suffer from its influence. Experience, moreover, tells us that it does *not* either in small or large quantities produce any bad effect on the human body. There is no “listlessness, languor, and debility;” no “chronic inflammation and swelling of different internal organs, especially of the liver, spleen, and mesenteric glands, with the consequent diseases of partial or general dropsy, jaundice, loss of appetite, and gradual wasting away” amongst the inhabitants on the banks of the “foul burn.” They all appear to thrive well; to eat and sleep well, and take no little pride in boasting of the salubrity of their situation. Mr Oliver of Lochend keeps several men constantly employed during several months in summer, in removing the sediment deposited in the tanks on the “foul burn;” and so far as his knowledge extends, not one of them, although generally up to the knees in the mud for ten hours a-day has suffered the least inconvenience from their filthy occupation. And for a specimen or picture of good health in ripe old age, we beg to refer Dr D. B. Reid to Alexander Lawson, who was employed in clearing the tanks and watering the meadows for a great part of his life, and retired from this employment only lately in consequence of old age, and not from any chronic disease caused by the unhealthy nature of his vocation. The extracts from the Records of the Burying Ground at Restalrig, showing the ages of those who had resided for a part of their lives in that village, and

are interred there, will show satisfactorily that Dr Reid is wrong in the opinion he has delivered.

It may be observed in regard to the official correspondence with the Lord Advocate, that the certificates of Sir George Ballingall and Dr Abercromby are worded with the greatest caution. Both appear to have been equally aware of the difficulty of giving a decided opinion upon the subject, and with their usual prudence, gave it on the side which was attended with the least danger. But we would like to ask, why the "Committee of the Commissioners of Police" have not inserted the whole of the official documents that were sent to the Lord Advocate? Why is the opinion of Dr Knox not published? We are perfectly aware he was applied to, and was at considerable trouble to inform himself upon the subject, by searching the Records of the Fever Board, and otherwise, before giving any statement of his opinion; and we are also aware that his opinion coincides precisely with our own,—that however disgusting and offensive they may be as a nuisance, there is not the smallest ground to suppose that the Irrigated Grounds are injurious to health. Dr Saunders also delivered a similar opinion. Drs Thomson and Davidson, if we are correctly informed, were likewise applied to, and gave in a written statement. It is a pity the "Committee of the Commissioners of Police" did not publish the whole of the written opinions, as it would have illustrated for once the truth of the adage, that "doctors differ."

There are many statements contained in the "Papers" which, had we either time or inclination, might easily have been refuted; such, for example, as that quoted from Mr Johnstone's Treatise on Draining, which asserts, "that the Cholera of 1832 was more prevalent in the district adjoining these *mires* than in other localities." So far from this being true, we can inform Mr Johnstone and those who have made use of his words, that not a single case of Cholera occurred in Restalrig on the very banks of the "fool burn." One case was reported to have occurred there; but as the history of the case is well known to us, we are warranted in saying that it had none of the symptoms of that alarming dis-

ease. The Cholera was also exceedingly mild in the South Back of Canongate; and comparatively so in Jock's Lodge and Comely Green, all in the immediate neighbourhood of the Irrigated Meadows. In reply to the remarks of Mr Rankin, who "bears unequivocal testimony to the insalubrity of that pestilential neighbourhood" in regard to the case of the Station Keeper and family, who were reported to be so unhealthy, it may be observed, (and we are warranted from the man's own declaration to say so,) that he was in the same unhealthy state *previous to his living* at Seafield Toll-bar. While he was engaged in a different employment he enjoyed excellent health; but so soon as he became a toll-keeper, which he did first near Dalkeith, he became a martyr to a stomach complaint, which he attributed to his rising during the night; for since he has been placed in a situation where he has got his regular rest, his stomach complaint has left him. His children, he says, enjoyed excellent health when at Seafield Toll-bar.

Had the name of Mr Macfarlane, surgeon, not been coupled with that of Mr Millar, King's Park, we would have passed over their "conjoint report" without a single remark. Mr Millar appears so zealous in this cause, and seems to magnify the most trifling circumstances into matters of the greatest importance, that we believe him incapable of giving an impartial view of the subject. Mr Macfarlane, however, is a young gentleman of considerable professional acquirements, and the last person in the world whom we would suspect of being moved by a blind enthusiasm, and far more enlightened (we venture also to say) than to *believe* that the greater amount of sickness on the one side of the Abbeyhill than on the other, was owing to any malaria arising from the "foul burn" which flows open behind the houses on that side where most sickness prevailed. Without denying the facts which Mr Millar has elicited, we cannot pass on without objecting to the conclusion he draws from them. In the *first* place, he has taken *only* the sickness of one year, and has therefore been unable to compare it with the results of a previous period; and, in the absence of such records, has not even attempted to compare it with that of any other district of Edinburgh in the same year. 2d, He has taken undue advantage of an accidental occurrence, to demonstrate the greater

amount of sickness on the one side of the Abbeyhill than on the other. Almost all the cases of fever were confined to two large families very nearly related, and who held frequent intercourse one with another, till scarcely one escaped from it, a circumstance which may not occur again in the neighbourhood for one hundred years to come. 3d, Mr Millar has not stated the difference of the circumstance between the inhabitants of the two sides of the street, nor examined into the state of their dwellings, a circumstance particularly worthy of consideration. Those on the south side, and nearest to the "foul burn," are generally poor; their apartments particularly small and confined, and many of them sunk three or four feet beneath the level of the street; while, on the opposite side, the houses are large, many of them self-contained, and the inhabitants generally in easy circumstances. These objections alone we would consider sufficient to reduce the arguments of Mr M. to their true value, but it is not our desire to take any undue advantage of facts which have come under our own observation to overthrow his statements, and shall, therefore, only take the liberty of comparing the facts which he has given us in reference to the amount of sickness in the Abbeyhill, with what is known of the state of disease in other quarters. We could scarcely believe that any one possessed of the most ordinary mental capacity, would have imagined that the malaria arising from the "foul burn" could have been three times more injurious to health at the one side of a narrow street than at the other. If its effects were so different in the short distance of 12 or 14 yards, (which we may suppose as the distance from the one side of the Abbeyhill to the other) how dreadful must be its effects on those dwelling 100 yards nearer to the source whence the malaria emanates; and how slight must its effects be on the city at large, when its power diminishes so much in the trifling distance of a few paces! But families live, and people work for months together in the very focus of these pestilential emanations, and yet enjoy excellent health. How are these inconsistencies to be reconciled? Only on the supposition that these emanations are perfectly harmless, and that disease, when it does occur, must be referred to some other cause. Taking then the whole sickness of both sides of the Abbeyhill as the real amount of disease in that particular locality, the only

method by which we can ascertain whether or not it is more unhealthy than other districts, is to compare its amount of sickness with that of other districts. In the absence of all other records, we shall avail ourselves of the information furnished us by 12 Male and Female Yearly Friendly Societies in Edinburgh. It is a regulating principle in these Societies, that none be admitted as members unless their health be approved of by a committee appointed from their number; and that the age of applicants for admission be not under 15, nor above 50. The valuable statistical tables of Dr Farr will also be of advantage to us, especially in comparing the health of the Abbeyhill with that of the working classes in England. The Friendly Societies in Edinburgh have been taken without reference to their particular locality; as from the Canongate, High Street, Carnegie Street, Morningside, &c., in order that a fair average may be ascertained; and we find that the average sickness of these societies is 20.2-5ths per cent. of the whole members yearly. The sickness amongst the men in Portsmouth Dock-yard is 37.8 per cent. besides accidents; in Sheerness, 43.7 per cent.; and in Chatham and Pembroke, 50 per cent.; giving us an average of 43.8 cases of sickness yearly for every 100 men employed at these different places. In comparing the health of the inhabitants of the Abbeyhill with that of the Yearly Societies of Edinburgh, we find, after deducting a fourth part of the cases of sickness which occurred on the south side of the Abbeyhill for infants and children under fifteen years of age, as also the cases of Dyspepsia—leaving 18 per cent.—that there are 2.2-5ths cases less than that which we have assumed as a standard, and we find that the opposite or healthiest side is 14 per cent. below the average sickness of the societies. But as the fairest means of comparison is to take the whole sickness of the Abbeyhill, deducting as before a fourth—the average then being 12 per cent.—we find that the sickness of adults in that reputed unhealthy neighbourhood, is in fact 8.2-5ths per cent. less than that which we have assumed as the standard health of the adult population of Edinburgh, and 31 per cent. under that of the workmen employed in the different parts of England already alluded to. We are not in possession of facts to enable us to state what is the precise amount of disease in the healthiest parts of the New Town in Edinburgh, but we can venture to assert, that it is far

above that of the Abbeyhill, the latter being in point of fact much healthier than most country villages.

It was our intention to have offered a few observations on the "injurious effects" which the effluvia is said to have on "particular individuals and families;" but when we reflect that scarcely two individuals are affected precisely in the same way, by the same agent, we consider it quite unnecessary to enter upon the discussion of the subject. It is a well established fact that the odour of certain flowers, which proves very agreeable to the smell of some individuals, will produce the most disagreeable sensation in others, and even in some, produce a feeling analogous to fainting—that one individual will be poisoned with the twentieth part of medicine which another would take with impunity—that one finds sweet articles alone agreeable to his palate, and another bitter. On the same principle, we would explain the difference of the effects produced on different individuals by the effluvia of the Fetid Irrigations. If one individual has fainted passing Meadow Bank, several thousands have passed it without fainting; and if one family, residing in the neighbourhood of the foul burn, "are stricken with boils," there are also many hundreds of families residing there who are not "stricken with boils." The only conclusion we can deduce from these rare exceptions is, that the effluvia arising from the meadows must be exceedingly harmless, else its bad effects would be more generally experienced.

While the genius of "Al Hakim" has furnished him with the means of marching the "noxious exhalations" in true military order, by "four columns" into the city, it is a pity that it had failed to suggest to him, that there were numerous ways by which also they could again march out. And while he attempts to show, by the regularity with which the wind blows in certain directions, how Edinburgh must be affected during the summer months by the four columns that come from the Glasgow road, he has entirely forgot to mention the bad effects which Craigentenny meadows must have upon the health of the inhabitants of Portobello. An individual, so thoroughly versant with the particular localities, in and about Edinburgh, as to march the "noxious exhalations" in the manner most agreeable to

his imagination, cannot be unacquainted with the relation of Mr Millar's property to Portobello, and of the manner in which the latter place must be affected with the effluvia arising from his lands. Portobello, nevertheless, is a place of fashionable resort during the summer months, and justly considered among the healthiest sea-bathing quarters on the shores of the Forth—and a place to which Physicians of all ranks recommend their patients, without any doubt of its salubrity.

III.

Is it an established fact, that the Fetid Emanations from the Irrigated Lands around Edinburgh do produce certain physical changes in meat, and that the butter and milk produced from cows fed upon the grass which grows upon them has a tendency to fall sooner into a state of decomposition than that taken from cows fed upon ordinary pasture? Were the grass of a deleterious nature, as has been boldly asserted by some, and were it proved to produce disease in the cows which feed upon it, we could easily conceive that a cow, in a state of disease, could not produce healthy milk; but while a cow is in a healthy condition, we hold that no kind of food will produce any very material change in the chemical properties of her milk, so as to expedite its decomposition. This we are prepared to state from most extensive inquiries upon the subject. That there is a difference in the taste, and sometimes in the appearance, and even consistence of both milk and butter we at once admit; and that the taste and odour of the articles upon which the cows are fed may even be communicated to these secretions we also believe; but it does not therefore follow, that there is any difference in regard to the length of time which the milk may be preserved; provided always the same care and attention be paid to cleanliness, and the kind of utensils in which it is kept. The evidence adduced in the "Papers on Fetid Irrigations," in order to show the deleterious influence which the grass of the meadows has upon the health of the cows is altogether unworthy of confidence, and seems to be opposed to the universal experience of the Cowfeeders of Edinburgh. "Whenever the supply of this grass becomes short," says Mr

Glass, "they are found to be incapable of digesting the usual fodder of cattle, *and completely diseased.*" "That the grass is most deleterious to cows;" observes another person, "horses will not eat it, and cows, if fed on it, *always* die within twelve or fifteen months." Mr Archibald Waddell is made to say, that "he has known many die from it; not from eating too much and bursting from the wind, but from *disease caused by the deleterious nature of the grass.*" We consider it unnecessary to refute these unfounded assertions otherwise, than by inserting the following declaration from the lips of Mr Waddell, and attested by his own signature, viz :—

"I was a Cowfeeder for 20 years at Easter Hermitage, which is on the road to Leith from Jock's Lodge, through Restalrig. I retired from business about two years ago, and at present I do nothing. I did not carry on business extensively, my stock of cows being on an average from five to seven. During all that time I used meadow grass for the cows; five years I purchased it from Mr Oliver at Lochend, and the remaining 15 years, from the Fillyside Meadows belonging to Mr Miller. I never had a cow which died from the use of the meadow grass. I always considered, and do still consider, that meadow grass is most healthy for cows. At first using meadow grass in the Spring, it requires a little care not to give the cows too much of it, but after they have used it, it may be given to them in almost any quantity. The cows were always the better of the grass, and I was always glad to get it. The same precaution requires to be taken when cows at first begin to use turnips. If the precaution is not taken when they begin to use meadow grass or turnips, it may prove fatal to the cows. I remember of Mr Millar of the Abbey, sometime before Whitsunday last 1839, when I lived in the Abbey, speaking to me about the effects of the meadow grass, when I told him what I have already stated. I never said to him that meadow grass was injurious to the health of the cows. I signed no certificate to him or any one else. Easter Hermitage, where I lived, is distant about a quarter of a mile or thereby from the Fillyside Meadows, and I have no hesitation in stating, that I never found the meadows

prove injurious to my health, or that of any of my family, which, at the time I lived there, consisted of my wife, and four sons and a daughter. It was a most healthy situation to live in.

(Signed) ARCHIBALD WADDELL.

It is unnecessary, after this declaration, to offer any further remarks on the absurd statements of Mr Glass, and the nameless gentleman. Mr Waddell's declaration is calculated to convey a very fair idea of the opinion, almost universally entertained by the Cowfeeders in this city. Any sudden change of food appears to affect cows in one way or another ; and the grass, like other food, must be used with caution at first. The apparent "disgust" which cattle appear to manifest when the meadow grass is first presented to them, does not appear to be owing so much to any dislike which they have for that particular kind of food, as from some change which it produces in their masticatory organs, that renders them incapable of chewing it. It is impossible to tell whether cows fed upon this grass "for 12 or 15 months," would die or not. The author of this statement has displayed more wisdom than all the authors of the "Papers, &c." put together, in as much, as he has taken up grounds which all the wisdom, experience, and ingenuity of man will fail to refute ; for none in this day and generation ever heard before of a cow feeding above the half of 15 months on grass at a time ; and few of our nobility will feel inclined to let out their hot-houses for the purpose of raising it to try the experiment !

If the evidence adduced has failed to establish the position, that the grass raised from the Irrigated Lands is deleterious in its nature, and has a tendency to produce disease in cattle which feed upon it, the question relating to the sudden change which the butter made from the milk of cows fed upon it undergoes, is still more imperfectly supported. "Bailie Campbell, Canongate, affirms, that butter taken from the milk of cows fed on the marsh grass turns putrid in less than *twenty-four hours*, and that the sweet milk will not keep that time." The high authority of a bailie is certainly weighty testimony in favour of the assertion, and shows how conscientious he must be in the discharge of his duties, when

his official dignity and authority are carried to matters affecting the interests of the dairy. Bailie Campbell is considered by most people to be a very intelligent man, and that his opinion on many subjects may be relied upon; but all with whom we have conversed agree in saying, that he is quite incapable of pronouncing judgment in the case before us. It may be observed, that cleanliness is absolutely necessary in order to the preservation of both milk and butter, and that if this be neglected, both very soon fall into a sour or rancid condition. It is probable that the want of this precaution was the sole cause of the sudden change in the butter and milk which came under the Bailie's observation, and upon which he has founded his opinion. We are led to this conclusion, because his statements are at variance with what appears to be an established truth. We have examined about forty individuals either connected with cow-feeding, or with the retail of dairy produce, and they unanimously agree in this,—that if attention be paid to cleanliness, and keeping the milk and butter in a freely ventilated apartment, they can be preserved in a sweet state for the usual period. On particular inquiry at some families who had been brought up in the country, and accustomed to the management of cows, we have learned that there is no more difficulty in preserving butter made from the milk of cows fed on the marsh grass than on country pasture, but that the milk is of a stronger taste in Edinburgh, owing to the draff and dreg with which the cows are always partially fed. If such is the opinion of those who are intimately acquainted with the preparation and preservation of butter, what reliance is to be placed on Bailie Campbell's judgment?

The question, in reference to the difficulty of preserving meat and poultry at Piershill is scarcely deserving a moment's consideration. Only one individual has given evidence of the fact having occurred; and it is therefore not yet legally established as a fact. If it was of frequent occurrence, witnesses would surely not be wanting to prove it. One gentleman who has been resident at Piershill Barracks for five years has not yet observed it, and has found no difficulty in preserving the meat for one week for the use of his own family. The inhabitants of Jock's Lodge do not believe there is the least foundation for the statement; as several

families, at whom we have caused inquiries to be made, have no more difficulty in preserving their meat and poultry there than any where else. There is no difficulty in preserving broth, milk, and butter at Restalrig; and the inhabitants of that village observe, that although their circumstances do not admit of them making large purchases of meat at a time, yet that they have often kept it from the Saturday to the Tuesday, and sometimes to the Wednesday, without being the least injured. Mr Oliver of Lochend has never heard any complaint of the meat not keeping in his house. No such plea was urged in the case of Duncan *v.* the Earl of Moira; and is it likely that Mr Duncan would have concealed so important a fact, had he known that the meat and poultry in his house could not be preserved for the usual period? How is it that Mr Glass of Marionville is silent on this question? Solely, we presume, because his experience cannot confirm it for a fact. If, then, none of the respectable families residing in the vicinity of the marshes, have ever experienced any difficulty of preserving their meat, we are compelled either to question the *fact* itself, or look for an explanation of it in something affecting the barracks alone, and to which the other places alluded to are not exposed. Several facts might have been mentioned regarding the number of troops which were quartered at Piershill at the period to which Jennings' testimony refers, and also to the paltry dimensions of the larder; but as our purpose at present is only to show that the cause to which Jennings imputes the change of the meat, &c. is not sufficient to account for it, we shall leave the further explanation of the subject to some one who has more time to devote to its consideration.

That the effluvia arising from the decomposition of animal and vegetable matter will *not* produce any material alteration in food of any description, appears now to be established from the following facts related by Duchatelet:—It had long been alleged by professional and scientific men, that individuals residing in the neighbourhood of laystalls, and dissecting-rooms, and public sewers, suffered not only from respiring an impure atmosphere, but from their food becoming quickly corrupted. In order to satisfy himself of the truth of this assertion, Duchatelet visited the neighbourhood of the Riviere de Bievre, an unparalleled stream of filth

and stench, and many of the laystalls of Paris, and especially those of Montfauçon already alluded to, as well as the houses of the servants engaged in the Amphitheatres of Anatomy, and the conclusion to which he has come, is, "*that the almost constant effluvia of these places has very little or no effect in corrupting, or otherwise affecting the wholesomeness of any article of food. Meat, broth, and vegetables seem to be as easily preserved there as in the healthiest and most airy districts of the metropolis.*" But this was not sufficient to satisfy the inquiring mind of Duchatelet; he carried on for a period of five months a series of direct experiments upon the subject; and these were conducted in such a manner, and with such precautions, as proved to a demonstration the accuracy of the conclusion at which he had previously arrived. He "kept different articles of food, such as blood, *milk*, chicken-broth, mutton-broth, beer, wine, gruel, solutions of starch and gum, as well as meats of various sorts, surrounded with vessels, filled with the most putrid and putrifying substances, and found *that they did not become decomposed sooner than other portions of the same substances which had been kept in a pure place.*" On this subject it is unnecessary to offer any further remarks. We have the utmost confidence in the truth of the statements of Duchatelet. He was too cool and deliberate to arrive at any conclusion rashly, and every opinion opposed to him, we would consider as too hastily formed and resting on insufficient data. And as his opinion is in direct opposition to that so frequently expressed regarding the difficulty of preserving meat at Piershill, and resting only on the authority of one individual, we have no hesitation in saying, that if it be a fact that such a change in meat has been observed, it is owing to some other cause than the effluvia arising from the Irrigated Lands.

Having now disposed of the three questions which we proposed to consider, we shall conclude our observations with a brief statement of facts collected from the Records of the Fever Board, intended to give a comparative view of the prevalence of fever in different districts of the city. A full extract is given of all the cases which occurred from 1st May 1834, to 1st May 1838, and which were sent to the Infirmary by the Fever Board; and although in many respects defective, is the best and only

authentic record of the particular districts from which fever patients have come to the hospital. In dividing the city into districts, we shall take that which lies in nearest contact with the Irrigated Lands as a standard and compare the others with it. We shall include in the *first*, all the closes and streets on the South Side of Canongate, from Comely Green to St. Mary's Wynd, viz. St. John's Street, South Back of Canongate, St. John's Hill, St. Ann's Yards, Abbey, Watergate, Abbeyhill, Spring Gardens, and South Side of Canongate. The *second* includes all the North Side of Canongate, from Watergate to Leith Wynd, North Back of Canongate, and all the closes between Canongate and North Back; New Street, M'Dowal Street, High and Low Calton, and Paul's Work. The *third* embraces the Pleasance, Richmond Streets, Simon Square, Carnegie Street, and St. Leonard's Street. Arthur Street, Salisbury Street, and Brown's Street, are purposely omitted, as being more immediately exposed to the influence of the marshes. The *fourth* district extends from Lothian Street to Causewayside, and includes Potterrow, Bristo Street, and closes between these two streets, Crosscauseway, Buccleuch Street, Hope Park-end, and Sciennes,—the population in this district being considerably below that of the first district. In the *fifth* district we include the Cowgate and its closes. In the *sixth*, the Grass-Market and West Port. And, in the *seventh*, and last which we propose to examine in the meantime, is included, the High Street, from the head of Canongate to the Bridges, with the closes on both sides of the street. The number of cases of fever which have occurred during the space of four years in each of these districts, is as follows :—

District	Cases.	Difference in favour of the Salubrity of the Meadows.
In the First,	163	
— Second,	344	201
— Third,	239	96
— Fourth,	156	13
— Fifth,	286	143
— Sixth,	251	108
— Seventh,	244	101

We very much regret, that as yet we have been unable to append a table showing the exact population of these districts, as it would have rendered the above statement of facts much more valuable. We expect, however, very soon to be able to do this; and although we cannot insure its completion before the publication of the present pamphlet, we shall endeavour as soon as possible to communicate it to the public.

Since the above was sent to the press, we have perused a most valuable work, just published, on the Management of the Poor of Scotland, by Dr William Pulteney Alison, the celebrated Professor of Physiology in the University of Edinburgh, from which we might have made many valuable extracts, but shall content ourselves with the following, recommending the perusal of the work itself to all who wish for information on this important subject.

“ In the Appendix to the fourth Report of the Poor Law Commissioners, it is stated by Drs Arnott, Kay, and Southwood Smith, that the malaria arising from putrifying animal and vegetable matters produces typhoid fevers. Although I highly respect all these gentlemen, and approve of the practical inference which they draw from that opinion, so far as it goes, because I have no doubt that vitiated air, like all other causes which weaken the human constitution, favours the diffusion of fever—yet I cannot subscribe to their opinion, that this cause is of itself adequate to the production of contagious fever. And if, trusting to that opinion, the public authorities should think it sufficient, in any situation where contagious fever is prevalent, to remove all *dead* animal and vegetable matter, without attempting to improve the condition of the *living* inhabitants, I am confident that their labour will be in vain. The true specific cause of the contagious fever, at least of Edinburgh, certainly does not spring from any thing external to the living human body. I have stated much evidence on this point in a paper in the Edinburgh Medical Journal for 1828, and could easily adduce much more. A case in point is given in a letter contained in the Appendix in question, from Mr Evans, surgeon in the Borough. “ I have attended, in nine months, above 500 pauper cases of fever, but cannot trace it to any local cause, for we have in the parish of St. George very good drainage, and very little accumulated filth, with the exception of certain courts and lanes *and there*

the disease does not exist more severely than over the parish in general. Another occurs to me in the letters of Dr Barry of Cork, published by Drs Barker and Cheyne. "More than once, on visiting the neighbourhood of deposits of manure, I have witnessed much misery in the inhabitants, shewn by general emaciation, &c. and yet they have been exposed to the continued agency of these exhalations, without shewing any symptoms of fever."

APPENDIX.

LIST of NAMES of PERSONS, Inhabitants of Restalrig and Jock's Lodge, Buried in Restalrig Church-Yard,—and to which reference is made at the foot of page 26.

Dates of Burials.	Names.	Restalrig.	Jock's Lodge.
1763. March 6,	Mrs Scouller,		65
1764. Jan. 23,	Mr Couper,	67	
— March 23,	James Telfer,		93
— April 11,	Widow Johnstone,		72
— Oct. 5,	William Cruickshank's wife,	66	
1765. March 14,	David Buchanan,	92	
— Nov. 9.	Mrs Butler,	80	
1766. Jan. 19,	Arthur Bishop,	76	
— Feb. 5,	D. Buchanan's wife,	88	
1774. Jan. 17,	David Gilchrist,	76	
— Feb. 3,	William Buchanan,	66	
1775. June 12,	George Muckle,	87	
— Dec. 22,	Elizabeth Nimmo (William Buchanan's widow),	66	
1776. Jan. 25,	William Bickie,	65	
— May 21,	James Robertson,	99	
1778. Jan. 19,	Mrs Cowie,	73	
1781. July 21,	George Erlesman,	66	
— Aug. 19,	William Grieve's mother (Mrs Thomson),	75	
1784. March 8,	James Brown,	84	
— Oct. 17,	James Johnston,	86	
1788. Nov. 21,	John Johnston,	78	
1790. Oct. 11,	Andrew Aitken,	68	
1793. March 5,	George Simpson,		85
— — 22,	William Fletcher's wife,	78	

Dates of Burials.	Names.	Restalrig.	Jock's Lodge.
1793. April 24,	Margaret Aitken (Peter Erskine's widow),	85	
— Dec. 20,	James Robertson's wife,	85	
1794. Nov. 26,	David Gilchrist's wife,	64	
1795. Feb. 4,	David Lawson,	79	
— April 28,	John Weatherston,		78
1796. May 8,	William Fletcher,	84	
— July 1,	John Weatherston's widow,		77
1797. April 21,	Thomas Wood,		95
— Nov. —	James Windroom,	90	
1799. Feb. 14,	Widow Cruickshanks,	81	
— April 12,	James Armstron,	66	
1800. Jan. 31,	Mrs Mary Veitch,		89
1803. Oct. 21,	Duncan Forbes's wife,	75	
1804. May 31,	Edward Coustin,	75	
— July 16,	Duncan Forbes,	80	
— Dec. 15,	Widow Douglas,	81	
1805. Feb. 24,	Marion Toward,	86	
— March 24,	Mrs Macdonald,		66
1806. March 14,	John Boggy,	81	
— June 23,	James Ronaldson,	73	
— Aug. 6,	Margaret Blackie,	} An old Woman.	
— Nov. 27,	William Wishart's wife,		
1808. May 31,	David Gilchrist,	79	
1810. May 9,	Ann Geddes Petrie,	76	
— Nov. 25,	Ann Hird,	75	
1812. Jan. 12,	Robert Rae,		73
— Jan. 28,	May Muckle,	84	
— Sept. 23,	Mrs Wylie,		74
— Dec. 20,	Thomas Nicolson,		84
1814. Jan. 25,	Peter Johnston,	81	
— June 30,	Barbara Esseleman,	86	
— July 17,	John Milne,		78
1815. March 13,	James Muckle,	87	
— Nov. 12,	John Ross,	67	
1816. Jan. 5,	David Barbour, labourer,	71	
— March 1,	Hugh Fraser,	84	
1817. Feb. 23,	Daniel Sutherland,		75
— March 30,	Margaret Dickson,		72
— April 15,	Thomas Easton,		74
— Sept. 26,	Margaret Paterson,		90
— Oct. 5,	Helen Ranken,		68
1818. Jan. 25,	Erskine Buchanan, slater,		65

Dates of Burials.	Names.	Restalrig.	Jock's Lodge.
1818. March 1,	Margaret Williamson,		76
— Dec. 20,	John Harper,	63	
1819. Dec. 15.	James Bell,	84	
1820. April 16,	Christian Greig,		61
— May 18,	John Fletcher,		70
— Aug. 30,	David Oliphant,		75
— Aug. 31,	John Machie's widow,		81
1821. Jan. 4,	John Carstairs, senior,		80
— April 6,	Robert Toft's (senior) wife,		73
— April 25,	David Bogie,		62
1822. Sept. 7,	James Begbie,		72
— Sept. 22,	James Lawson,		64
— Dec. 8,	John Carstairs's wife,	68	
1823. June 16,	David Rait's wife,	65	
— June 25,	Andrew Aitken's wife,	72	
— Nov. 27,	James Stewart's wife,	91	
1824. April 21,	Ann Walker,		68
— Oct. 6,	Andrew Gilchrist's wife,		74
1825. May 13,	Robert Tofts,		76
— May 21,	Alexander Taylor's wife,		62
— Dec. 24,	Louis Cauvin, Esq.		
1826. Dec. 10,	John Carstairs's widow,		84
1827. Feb. 9,	James Wright,		67
1828. Jan. 9,	— Buncle's widow,		63
— May 18,	John Thomson,		54
— Oct. 3,	Robert Mackie,		62
1830. Feb. 19,	Alexander Gow,		83
1831. Jan. 30,	Marcus Calder,	86	
— July 31.	John Reid's wife,		65
1832. July 12,	Helen Aitken,	68	
— Oct. 8,	Catherine Miller, wife of George Reid,		50
— Oct. 9,	M. Harper,	52	
— Oct. 30,	Janet Mathieson,	75	
1833. Feb. 8,	Robert Barclay,	83	
— Dec. 5,	Helen Watson, wife of Wil- liam Petrie,	76	
1834. Jan. 11,	Andrew Simpson,		84
— Feb. 5,	— Scott,		74
1835. March 18.	Mrs Wright, widow of James Wright,	75	
1836. Jan. 27,	Andrew Aitken,	73	
1837. April 30,	Mrs Mary Stewart or John- ston, widow of the late John Johnston,		77

Dates of Burials.	Names.	Restalrig.	Jock's Lodge.
1837. Dec. 6,	Robert Anderson,		75
1838. Jan. 16,	Henry Cribbes,	62	
— July 11,	Mary Anderson,		87
— Oct. 27,	Isaac Smart,		86
1839. Jan. 25,	Andrew Ford,	77	
— Feb. 11,	James Williamson,	52	

LIST of WITNESSES who were Examined on both Sides in the Case
of DUNCAN, v. EARL of MORAY.

<i>Pursuer's Witnesses.</i>				Resident in Restalrig.	Aged.
Andrew Sime,	-	-	-	29 years,	63
James Muckle,	-	-	-	40 years,	78
Peter Johnston,	-	-	-	All his life,	74
James Stewart,	-	-	-	34 years,	68
John Scott,	-	-	-	50 years,	88
James Lawson's Father and Mother,				51 or 52 years,	{ 76 72
<i>Defender's Witnesses.</i>					
Thomas Nicholson,	-	-	-	20 years,	75
George Crail,	-	-	-	27 years,	73
Henry Baird,	-	-	-	12 years,	70
Barbara Isleman,	-	-	-	30 years,	80