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NOTES AND OBSERVATIONS

UPON

THE CONTAGION OF TYPHOUS FEVER, AND CONTAGION GENERALLY.

By WILLIAM FERGUSSON, M. D., F. R. S. E.,

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(From the *Edin. Med. and Surg. Journal*, No. 112.)

THE following essay formed part of a paper which was read last February to the Medical Society of Windsor upon the contagions of the British isles, as connected with the then threatened impending disease,—*Cholera Morbus*. Circumstances arising out of the state of the public mind when that epidemic reached London, induced me to extract from it all that related to the new disease, and to publish it in the form of a separate pamphlet. The remainder I now offer to the medical world, *quantum valeat*, through the medium of your widely circulated

Journal,—convinced, as I truly am, that whatever may tend to throw light, or lead others into the right path of investigation for striking out the light of truth upon the mysterious agency of contagion, will, in consideration of the motive, whatever may be the success of the attempt, be received by the profession with liberality, indulgence, and candour.

These contagions,—I mean the true essential contagions, which, under a gaseous or aerial form, act of themselves independent of, and unaided by, the circumstances of climate, atmosphere, locality, quantity, and accumulation,—do not amount to more than five or six, and may all be comprehended under that class, of which it is the distinguishing characteristic, to occur only once, generally speaking, during the lifetime of an individual, with the exception always of those infections that can only be communicated by inoculation, or the actual contact of matter. I am far, however, from pretending to say that contagion is limited to so confined a range; for the whole class of *pyrexia*, under every shape and form in which they can be presented to us, including even those of *erysipelas* and *ophthalmia*, can be made infectious diseases * through an undue accumulation of human exhalations, and defective medical police, constituting at these times, and under these circumstances, an undoubted well-marked atmospherical contagion of locality,—but of locality alone.

From the first of this enumeration I have no hesitation to strike out *typhus* fever, and class it amongst the latter; but here, in order to bring conviction to my readers, I feel that it will be necessary to expatiate and explain at some length.

Typhus fever, a disease purely endemial, may be called the endemic of the British isles, and the same parallels of latitude on the continent of Europe. † If we could suppose it during any summer season to have become utterly extinct, it would certainly spring up again in the wet and cold weather of the first winter months, before the frost had fairly set in, and keep its hold amongst the inhabitants until warm, and, above all, dry weather, had again caused it to abate. So great is the tendency of this our soil and climate to produce it spontaneously, that any depressing cause, subversive of bodily vigour, will, in a remarkable manner, predispose the body for falling under its influence. Thus, the humid, ill-ventilated, and imperfectly heated dwellings of the poor are in such seasons its constant abode; and if to these we add the adjuncts of “cold and fatigue, and sorrow and hunger,” the sad concomitants of poverty, we need

* The first of these may even be akin to hospital gangrene in our great hospitals, or not impossibly the same disease affecting a different tissue.

† Vide Bancroft.

not wonder when we see it devastate the hovel and the cottage. Even so trifling a cause as the continuance of wet feet,—that most noxious and depressing, because adhesive and permanent application of cold, where the circulation at the extremities must necessarily be the weakest,—has been known to induce an attack of *typhus* fever, when the moral and physical causes just enumerated could have lent little aid otherwise to the developement of the disease.

Typhous fever, then, is not only an endemic disease *sui generis*; but so strong is the predisposition to that form of *pyrexia*, that it is prone to become an aggravation and super-addition to other forms of fever; and all the remittent types and degrees, as well as the catarrhal and peripneumonic fevers, are apt, either when long-continued, or improperly treated under a heating regimen, to glide into it. This must be familiar to every practitioner; and I need not here dilate upon it. But besides the endemic origin which I have here explained, there appears to be another source of the typhoid poison quite independent of season, atmosphere, and locality, which gives rise to a most virulent, aggravated, and dangerous form of this fever. I mean that which arises from accumulated human effluvia in crowded ill-ventilated hospitals, prisons, ships, barracks, or other habitations.

I acknowledge it to be unphilosophical and incongruous to imagine that two fevers springing out of sources so distinct should yet so entirely resemble each other, that they have ever been treated, classed, and acknowledged for the same; nor can I afford any satisfactory explanation of this phenomenon. But the fact is certain that they do so arise; for, in the contagious ulcer, or hospital gangrene, we possess a demonstrable, tangible, and visible proof of its existence. This ulcer is precisely a local form of typhous fever,—a visible personification, if I may use the term, of the typhoid poison. It never occurs but under the most distressful crowding of sick and wounded; and it is then so highly contagious, that all other ulcers, or even abrasions of the skin, however healthy before, are speedily involved in its destructive course; and so highly does it impregnate the surrounding atmosphere with its contagion, that it is not even safe to bleed a patient in the same ward where it lies. You may look in vain for its origin under any circumstances in our hospitals, but those just enumerated as being capable of inducing typhous fever upon the sound healthy inmates; but in the wounded, where the poison finds a *nidus* and a vent, instead of affecting the constitution generally, it commits its hideous ravages upon the wounded limb. *

* The above relates to hospital gangrene alone, and has no reference to endemic

In treating this deeply interesting subject, I strongly feel how misplaced and unworthy would be any attempt at sophistication of argument, or desire for victory, at the expence of truth; but the truth is of so much importance, that I shall proceed even at the risk of being tedious to farther illustrative evidence and argument.

That moist cold, when applied to the destitute under circumstances of moral and physical depression, is, and ever must be, the endemial source of typhous fever, causing it to spring up spontaneously in this country with each revolving season, I have already shown. Should it be doubted, I may refer to the two extremes of the tropical regions, and those on the borders of the arctic circle. In the first it is never endemic, and cannot be called into existence under any circumstances but those of the most defective medical police; and in the second, while sojourning there, I found to my surprise that it was almost equally rare; but the cause was not altogether hidden. The Russian peasant, although inhabiting the most rigorous climate of Europe, feels little of moist cold. The approach of winter is sudden, and the ground is almost immediately bound up dry in frost. His habitation is close and ill-ventilated; but he heats his stove night and day to an astonishing degree,—to that degree with which humidity is incompatible, and no contagion can exist; and every Russian and Finnish peasant, however filthy in his clothing and person, invariably takes a vapour bath at least once a week during all seasons of the year. The Esquimaux Indians,—those children of the arctic circle,—filthy even to a proverb, are said to know nothing of typhous fever. They live in their snow-built huts,—the driest of all habitations,—although heated to a high degree in the centre by a large lamp of whale oil, and know little or no disease till the advent of their short summer, when the melting of their fusible walls subjects them to pleurisies in as great a degree as the inhabitants of Europe.*

Such, then, is the endemial (and irremediable in a great degree, because endemial,) source of typhous fever amongst us. That other *fons et origo mali*, undue accumulation of human *effluvia*, ought to be remediable at all times amongst civilized

or constitutional ulcers, which, however formidable their ravages may be, are never in themselves contagious. It may, however, reconcile my readers to the above doctrine, to state the fact that ulcers, devastating ulcers, have been seen in many parts of the world to be the substitute for endemic fever. Our army in St Domingo during the years 1796-7-8, abounded with such proofs; and in some parts of the East Indies, where I have never been, I understand that examples of it were even more rife.

* A reclaimed Esquimaux of the name of Zaccheus, who was hired to accompany the first northern expedition under Captain Parry, although cradled midst the Polar snows, could not stand the vicissitudes of an ordinary Edinburgh winter, but died of *pneumonia* in the Infirmary there during the winter 1819-20.

nations; but where the evil has been neglected or overlooked, the effect is certain. No place or climate can be exempted from the punishment. Witness the Black Hole of Calcutta, where the survivors of that horrid night underwent the ordeal of putrid fever as soon as they were released.* Witness our own jails and prisons, where, in worse times than the present, the condition of the prisoners became so terrible that it was unsafe to bring them into court for trial; and witness, too, the hospitals of our fleets and armies, when, under the difficult circumstances of warfare, wholesome accommodations for their numerous inmates became too often a matter of impossibility. But the principle even goes further, and may be found existing amongst the lower animals, which, when cooped up in the close holds of ships in unfavourable weather, become actually infected with what may be called an epizootic typhous fever.†

All this I know has been denied by other writers, more especially by Dr Bancroft, whose philosophic inquiring mind was never to be satisfied with mere words; and it must be acknowledged with some apparent reason; for the generation of the typhoid poison has been never known to come from a hurried process, and would seem to proceed from a slower concoction than the sudden crowding together of a number of people, for a single night, could furnish. It is farther well known, that typhous fever can neither be carried into tropical climates, (for even the plague stops at the tropic of Cancer,) nor take root there. Governor Holwell, then, may have ignorantly asserted in his narrative that he was taken with putrid fever after his release; but the boils and critical abscesses with which he and his surviving companions were covered, show that some morbid poison must have been imbibed into the system; for boils do not in any country come as a result from violent perspiration, which in India and other hot climates produces the eruption, (and no other,) which goes by the name of *prickly heat*. Relying upon the respectable authority and pure character of the philanthropic Howard and other writers whom he quotes, he (Bancroft) has evidently been misled, when he affirms for a fact that naturalized typhous fever does not exist in any other countries of Eu-

* Vide Governor Holwell's narration.

† The term *typhus* fever may appear ridiculous as applied to the lower animals; but the author actually saw something very like it when a passenger on board of a transport that was employed to convey a cargo of sheep from the Island of Exuma, in the Bahamas, to Cape Nicholas Mole, St Domingo. The weather being fine when the sheep were embarked, and the run expected to be short, a very great number was put on board; but the passage turned out tedious and stormy, with closed hatches, causing a great portion of the animals to die with black tongues, putrid mouths, and the blood in the larger vessels like the thin lees of port wine. The disease could scarcely have been scurvy, for there was plenty of fresh vegetable provisions ordered on board.

rope than those of the British isles, and that it only visits the former as a transient imported disease from the latter.

The strongest negative evidence to the contrary of this has been furnished by every European army in the field during the late war, and will be furnished hereafter, so long as armies pursue the operations of war, according to the system of Napoleon, during the winter season, instead of going into winter quarters. In the colder countries of Europe this was to have been expected; but Portugal and Spain, after their summers were past, were even more prolific of the typhoid contagion if possible than Germany and Russia. From this cause the Spanish army of the Marquis Romana, when it crossed ours in Gallicia on the retreat to Corunna, was in a state of pestilence,—a moving cloud of the disease. The Portuguese *Depositos*, as they were called, (district prisons for the conscripts,) managed by villanous native commissaries, who robbed the recruits in every way of their food, clothing, and supplies, were destroying the army from this cause far faster than it could have been recruited, until they were placed under the direction of British officers; and the people of the country, when driven from their homes and penned within the lines of Lisbon during the winter of 1811, were cut off in thousands by the disease. To say that these were not typhous fevers would be ridiculous. They were absolute caricatures of the disease in all its features,—not to be matched, I am convinced, in the worst times of Ireland. The Spaniards could not receive the infection from the British, for with us they never amalgamated; and their armies, remote from our line in the winter seasons, were paralyzed from the same cause as Romana's; but we got it from them whenever obliged to follow in their course, and take up their infected cantonments. Nor did we get it, nor even take it, from the miserable population inclosed within our works near Lisbon;—the winter diseases of the well-fed, well-lodged troops, being those of the season and field operations alone, not typhous fevers.*

I acknowledge that there may, indeed must, be a peculiar aptitude in the moist soil and climate of the British isles for the generation and nurture of the typhoid poison; but this property of generating the typhoid principle is not exclusively peculiar to the insular soil. On the contrary, it is common to the human race whenever the circumstances here denoted can be brought into full operation and combination; and even the high temperature and dry atmosphere of the tropics, however soon and certainly it may

* I can speak to these points with the more confidence, from having held the situation at the time both of Inspector-General of Hospitals to the Portuguese army, and that of a member of the Junta that sat at Lisbon for the succour of the distressed population.

dissipate the principle, is not altogether proof against its generation,* which has infested, and will infest mankind, so long as they

* The following extracts from a report of my own to the Army Medical Board, dated Barbadoes, September 8, 1816, on the Childers brig of war, may probably illustrate this point; and, as they were written without reference to any ulterior object or purpose, but were simply a statement of facts, they may be reckoned on that account the more conclusive.

This vessel was in so distressed a condition from the sudden invasion of fever during a ten days' passage from Trinidad to Barbadoes, that, had she not been favoured by the winds, she could not in all probability have been navigated into port. Nearly one-half of her people had perished in that short time, and five-sixths had been taken ill. The following is the description:—"All the medicines that are commonly used in fevers had been expended several days before the ship got in, as well as the sick stores and hospital comforts of every kind, from this unlooked for accession of disease. When the sick arrived in hospital, four of them were in the last stage apparently of typhous fever. Their vomitings, such as are usual in tropical fevers, had ceased, as I understood, for days. They were in a state of low delirium, with *subsultus tendinum*; the teeth and mouth furred, with black dry tongues. One of these patients exhibited the well known symptom of picking at the bed-clothes; and, on the whole, I had never before seen fever so markedly typhoid within the tropics. Some of those, too, who were recovering, were in that fatuous lost condition of intellect that is often seen in patients recovering from an attack of *typhus gravior*, and may be called peculiar to that form of disease. The sick medical officers were in a state little capable of giving clear accounts of the origin and progress of the disease," &c. &c.

In another part of the report upon the origin and causes of this state of things is the following: "The rains that ordinarily fell, according to report, during six hours of the day, obliged the greater part of the crew to seek shelter below, mixing with the sick, and generating from the crowd a vitiated foul atmosphere, as much to their own danger, as to the aggravation of the disease in those already ill. Such a condition of atmosphere within the ship seems in fact to have generated what many think impossible in these climates,—a hybrid compound fever of the widely differing types of the ardent and *typhus*, and to have been propagated by contagion, under circumstances of mortality and distress that rendered it impossible to preserve ventilation and discipline." In continuation, after the sick were housed in our excellent Hospitals, the report proceeds to state: "It is most gratifying to report that no sickness of any kind has been communicated to any medical attendant, or other person of whatever description employed about the sick, although the devotion of the medical officers to their duty on this interesting occasion has been unbounded. The hospital assistants have scarcely ever quitted the hospital yard since the seamen were first brought on shore; and two of these are young men recently arrived from England, for whom I had the most serious apprehension,—not that they would be exposed to contagion, which in these climates I have ever found to be impossible under circumstances of due ventilation, discipline, and accommodation,—but that fatigue, watching, and exertion, would predispose them to be attacked by the endemic yellow fever of the country. In regard to the ship, I have never ceased to insist on the necessity of her complete purification, in all respects, by the removal of every article of ballast and stores preparatory to fumigation with charcoal fires, white-washing," &c.

This was at last effected, when her hold was found to be in such a state of fermentation and impurity from foul ballast, that a candle would not burn in it, and the stoutest negroes fell down at the work.

A few years afterwards, another ship of the same class, (the *Narcissus*, I believe, but I forget the name,) underwent the same mortality, under exactly the same circumstances, as reported upon by Staff-Surgeon Hartle, from Antigua; and a little more than a year before the arrival of the Childers, the *Regalia* transport, as reported upon by myself, suffered nearly as much from having stowed on board a cargo of green wood on the coast of Africa.

In this way, then, may we account for particular ships of a fleet, and particular parts of these ships, being ravaged by fever, while all the rest are free; for at the very time the Childers thus came into harbour at Barbadoes, the *Scamander* frigate

fail to observe the decencies of civilization, or neglect the preservatives which reason teaches, and all governments ought to enforce. Happily for the continuance of our race, this infection, so easily generated, is essentially an infection of *fomites* alone,* (allowing that the qualities of atmosphere can be so denominated,) incapable of transportation as a personal contagion, and requires the aid of its own contaminated atmosphere before it can be diffused as an epidemic disease; for it would otherwise open the widest outlet, and constitute the severest drain upon human life.†

I assume, then, for reasons which I shall now farther illustrate, that endemic typhous fever is not essentially an infectious disease; that it may be approached at all times with impunity under ordinary circumstances of ventilation and personal purity; and that where those are observed, it cannot be carried or transported by any sick, however ill, so as to affect others in a different locality. To say that it has often spread to other inhabitants of the same locality or dwelling even, if it be incapable of transportation, does not constitute a contagion.

It only amounts to a disease of locality, very frequently remittent or catarrhal fever, sublimed into *typhous* through neglect or improper treatment; and even should it infect visitors who choose to place themselves within its influence,—upon the same ground, that would be no proof of contagion, unless those visitors could also carry the infection so as to communicate it to others upon different ground at a distance; for to talk of contagion limited to one spot, is surely only saying that the spot of ground, and not the person of the patient, must be the source of the disease.‡

also arrived with a fatal yellow fever pervading the midshipmen's berth alone, four of these young gentlemen having died in a very short time, without affecting a single other individual except the assistant surgeon in the same berth, and a ship boy.

* The question of time in regard to the retention of infection by unpurified *fomites*, is a most important one. I think it may fairly be presumed, that the infection will adhere to saturated woollen clothing and other absorbent substances, as long as the dried matter of small-pox can retain the powers and qualities of an inoculator.

† Gratitude and respect for the author of the Essay on Yellow Fever, that splendid specimen of philosophic induction and freedom of inquiry, which dissipated at once the prejudices of a century, would make me diffident and cautious how I impugned opinions so well advocated and ably supported as his. But, *magis amica veritas*; the experience of my life has so strongly impressed me with the contrary, and I esteem the truth of so much importance to the best interests of humanity, that, averse as I am even to friendly controversy, I have not hesitated, for the sake of the object, to enter its lists with a powerful antagonist, relying upon his tolerance and candour for a reconsideration of the subject, and the indulgence of a liberal mind to those who differ from him, on the open public ground of medical inquiry and sanatory research.

‡ This point has been well and ably illustrated by Dr Elliotson of St Thomas' Hospital in his published lectures; and every attentive observer must have noted manifold instances of the same. One of these that occurred in the summer of 1830, was so remarkable as to induce me to call to it the attention of the Medical Society

In this transportability resides the very touchstone and answer to the question of contagion. To suppose that a patient, infectious in his person, can only give out disease in a particular atmosphere and place, would be like what we have all read in the early lessons of our childhood, where an individual performs a prodigious leap in the island of Rhodes, but could not possibly be made to do it anywhere else. With equal justice may we assert that our contagious *exanthemata* can only become diffusible under similar circumstances, or that the infections of *syphilis* and *scabies* are influenced by the laws of atmosphere and locality. In regard to *variola*, the chief of those *exanthemata*, we may with more reason draw the direct contrary inference; for, previously to the discovery of the vaccine preventive, it used to be during the finest weather of the season that our babes, when carried out in arms, were struck and blighted by the disease, from passing even momentarily to leeward of an infected subject. Nor is it unreasonable to believe, that the very purity of the atmosphere actually contributed to the efficacy and surety of the infection; since then the contagion would be less adulterated and dilated with moisture, or other extraneous matter. No one would so dilute the actual variolous fluid (if a fluid) before proceeding to inoculation; and the contagious vapour can be nothing else than the same material under a gaseous form.

That other form of typhous fever which I may call factitious, (as being created by ourselves out of causes over which we ought to have exerted due control,) to distinguish it from the endemic, which we cannot prevent, must also be contagious under the same circumstances. Here, however, I believe, in like manner, that the person of the patient, independent of *fomites*, never gives out at any one time a sufficiency of the typhoid poison to affect another healthy person; that the poison can only be made effective through contamination of atmosphere, under long-continued accumulation of morbid effluvia; and in fine, that the atmosphere of the patient is infectious, and not his person, which, if once cleaned and purified, and ventilation re-

of Windsor. In one of our foulest lanes, close by the river side, a patient of the Dispensary was taken with typhous fever, so strikingly marked in all its features, character, and history, that it could not be possibly mistaken. In the small close room that he inhabited, seven others of all ages slept; and when the apartment was shut up at night, its atmosphere was literally intolerable to a visitor from the open air; yet not one of these seven took the fever,—while another case exactly similar occurred within two doors, and dropping cases of the same were dotted up and down the neighbourhood, without ever proving infectious in the same house. I account for the escape of the inmates of the first, from the disease occurring in June, then the driest season of the year, admitting the finest ventilation through the day, and permitting exit from the apartment to all at the earliest of the morning. Had this fever made its invasion in the winter season, when the same ventilation and purity must evidently have been impossible, I cannot doubt but its accumulated *fomites* would have proved violently contagious.

stored, may be approached, however ill he may be, with perfect impunity. In this belief I feel warranted, from the knowledge of several important facts, of a character so general as to warrant the greatest confidence in their application. *1st*, The Bristol Hospital, for a great many years, has received typhous fevers into their well-disciplined wards, without having ever spread the disease even to the most contiguous beds. *2d*, Several of the great hospitals in London have followed the same example with the same results. *3d*, The most pestilentially dangerous fevers to approach when single, in the confined dwellings of the poor, have almost everywhere been found devoid of every infectious principle when collected together in numbers, and confined by the hundred within the walls of a well-regulated fever hospital. Upon this point the question of contagion must turn; for, if the evidence here given be not impugned, it will be impossible in human testimony to adduce anything more decisive and conclusive. Reasoning from single individual instances will generally deceive; but well-digested impartial observation upon masses of men can never lead to an erroneous conclusion. *

While I thus, however, express my conviction of typhous fever never being a true essential contagion under any type, I must allow the question to be in some degree open to discussion, in regard to that (type) form which has an animal origin, and may justly be called an animal poison. The evidence of the great hospitals just alluded to would imply a negative; but it remains to be proved whether that belief may not have been founded upon the evidence of endemic typhus only, without experience of the other form of the disease. Thanks to our improved prison-discipline, such cases must now be rare. But when they existed in former times, the Black Assizes at Oxford, the Old Bailey Sessions, and other Sessions in Ireland and elsewhere, recorded in the different medical journals, would give fearful proof of its dreadful powers. I acknowledge, too, that the infection of hospital gangrene is a transportable and inoculable contagion, as applied to other ulcers, and that puerperal fever, another local modification of typhus, may be carried from house to house in any locality. With regard to the jail fever above alluded to, however, my own belief leads me to the conclusion, that the contagion resided in the woollen clothing of the prisoners in the dock, from whence it is stated that a stream of

* The author alludes here to what he witnessed, more especially at Liverpool, when on the staff of the north-west district, in the year 1804. Typhous fever had, up to that time, proved a most virulent and dangerous contagion to the medical faculty visiting the poor in the lower part of the town, who lived for the most part in cellars or other wretched dwellings: but on the building of an excellent Fever Hospital, its character there as a contagious disease altogether ceased.

air from an open window blew directly upon the court; and that, had they been furnished with fresh clothing, and their bodies purified before being placed there, the closest proximity or actual contact would have produced no disease whatever.

This belief I ground on the fact, that woollen covering of any kind is as open and as prone to absorb, as it is tenacious to hold in accumulation, every species of animal exhalation; and the records of our press-gangs and prisons will show, that men would, in those days, be introduced into our fleet and armies, who for months together had never once had their clothing changed by night or by day; and this leads to another consideration of mighty import in the history and consideration of disease; for it would seem that these men had not themselves at the time the dreadful distemper, which they communicated with such fatal effect to the Court that tried them. That they had it not at the time I can fully credit; but that they were about to fall into it, and that, too, under its worst form, may be fairly presumed.

This proposition is not paradoxical; for it has been verified, and may be seen every autumn in all the aguish districts of our own country, that the actual inhabitant of the swamp itself, immersed night and day in a sea of malaria, is never so liable to fall under its influence as his neighbour on the dry rocky brow of the hill immediately above the marsh; thereby proving that the continuous application of a morbid power from without so deadens the nervous energy, that it becomes incapable of assuming the reaction and resistance which would be necessary to throw it off, under the form which nature has decreed of acute disease. The release from the deeply infected cells of a prison to the pure open air,* would seem to restore this power to the

* It is familiarly known that the inhabitants of the malarious districts of Lincolnshire, who never had the ague there, are certainly struck with it on removing to Yorkshire, another healthy hilly country.

In my inspection report of the Island of Trinidad, dated March 1816, I find the West India rangers,—a corps composed of deserters and military criminals,—described “as generally labouring under cachectic hydropic debility, like the advanced stages of *mal d'estomac* (dirt-eating) of negroes, or chlorosis in women, without distinct type of disease, and consequently, without light to understand the case, or guide to apply a remedy. This form of illness, which, in the worst and most incurable cases, appears without preceding fever, as an original primary disease, sapping the powers of life and animal energies through some silent inexpressible operation, is so common to the marshy unwholesome districts of Trinidad, at some distance from the sea coast, that it has been called by the military the Trinidad disease. I believe it proceeds from the action of the latent marsh poison on the constitutions of those who have become so debilitated by long exposure to its malignant blighting influences, as to be incapable of assuming the forms of regular fever, or the powers and chances of throwing it off, by the channel which nature has decreed, of acute disease.

“The European medical officer, if he has been conversant with intermittent fevers and their *sequelæ* in colder latitudes, would, in viewing the ranks of a Trinidad corps, pronounce them to be generally afflicted with *splenitis* in its different stages, many of them in its last, so remarkable is the tallowy bloated appearance of the

prisoner, in the same way that the inhabitant of the hill, in a swampy country, from breathing alternately the wholesome air of Heaven, with the noxious vapours from below, always retains it, and leads the superficial observer to the fallacious conclusion of dry rocky ground being more pestiferous than the bed of the fen itself. But how different is the true state of the case. The dweller in the locality below may, it is true, exhibit no acute disease; but every organ is disordered;—he has no health in any way, and is certainly destined to an early grave; while the other, although he may have imbibed the poison in its fullest dose, still possesses the power to throw it off, by an effort of his constitution, however dangerous and painful. He may, through such an ordeal, be restored to pristine health and vigour. With his benumbed neighbour, unless he removes from the marsh, it is impossible. He has been struck to the vitals, and must succumb to his fate. This is not imaginary, nor am I speaking of what I have not seen and examined. In many of the malarious districts of Spain, old age, among the resident inhabitants, was unknown. On the marshy banks of the great Guiana rivers, and in the central districts of Trinidad, presenting as concentrated a body of swamp as any in the world, our soldiers died by hundreds, blighted and withered, without ever showing a paroxysm of fever; and it is even recorded by Dr Gregory of Edinburgh, in his lectures, that in a most unwholesome locality of the Southern United States of America, of which, at the distance of 40 years, I now forget the name, no native inhabitant constantly residing, ever attained the age of 21 years. I have been

countenance, the lividity of the lips, and pearly whiteness of the eye; and it is with surprise he finds on dissection that the abdominal viscera are seldom more than secondarily affected, that the thorax is the principal seat of disease, where the heart is found to be enlarged, pale, flaccid, inelastic, covered with fat, and swimming in a pericardium filled with dropsical effusion. Under these circumstances, where the ill prepared arterial blood, deprived of its red particles, can communicate neither density nor energy to the muscular fibre, though the miserable sufferers may often live a long time, they are unfit, even in the early stages of their illness, to make any active exertion. The first time I saw the West India rangers march in quick time round the garrison parade of Barbadoes, where they had been called, after a long residence in Trinidad, to accompany the expedition against Guadaloupe, they staggered, dropt, and fell by dozens out of the ranks, like men under a murderous fire of musketry. Fifty of them were on the ground before they had made a single round, (little more than a mile,) whose quivering lips, and ghastly looks, and hurried breathing, presented a striking image of the mortally wounded." An inspection was immediately ordered, and a large proportion of the men was left behind; but the remainder, when they came to land in Guadaloupe, were found to be quite unfit, as a corps, for their own light service of the woods and mountains, so generally were they affected in the manner just described. My friend Dr M'Cabe, now of Cheltenham, then surgeon of the York rangers at St Joseph's, upon the great eastern marsh Trinidad, who was most indefatigable in his researches and dissections, I consider to be better qualified, from the opportunities he then enjoyed, than any other observer, to give useful information upon this mysterious manifestation of the marsh poison.

led into this digression from my desire to prove the possibility of the most intense existence of a cause, without a visible symbol of effect, as in the case of the prisoners of the Old Bailey, and the inhabitants of a deeply malarious county.

It has been said that typhoid contagious fevers never prevail even in the most crowded slave ships; and I believe the statement, because the heat to which the inmates are subjected in these climates is unfavourable to the generation of contagion, or rather is sure to dissipate it, even under the most limited ventilation; and the poor creatures, being in a state of utter nakedness, are saved thereby from the accumulation of the infectious principle, to the communicable degree under the form of *fomites*. The exemption of the Greenlanders, the Esquimaux, and the Kamschadales, if true, is not so easily explained; for though the dry cold of the arctic winter may be incompatible with the development of the contagious principle, it ought to be unloosened and spring into activity with the melting of the snows, and the first moisture of their short-lived summer weather. There may, however, be circumstances in the savage life and idiosyncrasy of the natives unfavourable to the existence of typhous fever, which a better acquaintance with their habits may hereafter elucidate. At present it is an anomaly, which might be explained on the assumption that the infection had never been introduced amongst them; but even this, were it true, could never account for its non-generation, under circumstances more favourable to the first explosion of the disease than ever occur amongst civilized nations, supplied with the means, and endued with the knowledge to preserve themselves.

A better explanation than this would seem to offer itself in the absence of the depressing passions—those powerful emasculators of human energy—which are unknown in the savage life, or at least are never felt after the grosser animal wants have been supplied. All that is comprehended under the French word *MORALE* has amongst them no existence; nor can its all prevading influence be called into action so far as to affect their bodily health. Few, I believe, have ever seen an insane negro, even under the most cruel slavery, and fewer still an insane Indian in his native woods. With idiopathic fever, then, they may be said to have little or nothing to do, which, as distinguished from the sympathetic fever of wounds and inflammation, is unknown amongst the lower animals, and would appear to be a characteristic contingency of our more perfect organization—nay, more, to be a product of civilization—of those superior attributes and functions of the brain, with which the lower ani-

mals have not been gifted, and which man, when little removed above that state, never exercises. *

There is still another principle bearing resemblance to contagion, and affecting the health of masses or bodies of men, of which, as it acts upon the fluctuating bases of moral and mental agencies, it is difficult to give any intelligible account. The health of a ship's company, for instance, or a corps of troops, when the *morale* is good, the discipline strict but kind, and the confidence of the men assured, will often be found firm in the midst of endemic and epidemic diseases; and plague and pestilence seem to pass them harmless until the introduction of unseasoned † recruits, even though healthy at the time,—a change of system, or some other cause, makes a break in the general health; and then will the whole rush into disease with a proclivity of current fully as remarkable as the preceding immunity. It would be ridiculous to say that this can be similar to what we often witness in *Chorea Sancti Viti*, or the imitative hysteria of girls, or the familiar acts of yawning, stuttering, &c. Yet it may be akin in a certain sense; since all our sympathies are contagious, as the word itself implies; and when the protecting shield has been removed, these seize the reins, and guide the man without restraint. So fully, indeed, do they possess him, that when his mind is impressed with the dread of impending pestilence, his ordinary disease, it is well known, will be suspended, and when it actually arrives, will be merged into the vortex of the new epidemic. Farther than this, the ascertained laws of incubation will so far be set at nought, that a terrified patient will not only fix the precise moment of infection, but will actually sicken prematurely with small-pox, (a latent infection must of course have been previously received,) through the spectacle of the disease in the person of another, or through the disgust (and nothing worse) of an excremental smell, strongly affecting his alarmed imagination; or through the same impression he may fall down the victim of an impossible contagion, like that of yellow fever. In the face of the obvious fact, that children who have no imaginary fears, nevertheless partake largely in every spreading sickness, I would advance nothing so absurd as, that mental impressions are contagious, or can produce specific diseases. But in those general affections, such as idiopothec fevers, where

* At a meeting of the Academy of Medicine on the decline of *cholera morbus* in Paris, the celebrated Esquirol reported the fact, of the lunatic patients of the Charenton having been altogether exempted from the epidemic, and further, that it had not been communicated, in a single instance, to any patient of the other lunatic receptacles of that capital. Vide, London Medical and Surgical Journal, May 19th.

† The venerable Sir Gilbert Blane has noted and well illustrated this fact many years ago, in his excellent work upon the diseases of seamen.

the brain and nervous system, instead of being the agents, are so often the subjects of the proximate cause, I cannot doubt that they eminently predispose to the explosion, and influence the current of every epidemic.

Before dismissing this part of the subject, a most important consideration still demands our attention, and that is, whether any species of aërial invisible contagion can be given out, and communicated to the living after the death of the patient. My own belief, for which I have already stated reasons in a published paper, is, that it must be impossible. I am aware that various writers worthy of the highest credit, have attributed this property of contagion after death, to a disease I have never seen,—the plague; and I know well that the infection which resides in the grosser demonstrable matter of small-pox may be carried after death beyond the parent body round the world, without losing its original powers,—that for as long as it remains a depot and *fômes* upon the surface of a corpse, it may be sublimed from it, and infect others either through means of a current of air, or through the heat of atmospheric temperature, or through the heat generated in the process of putrefaction; and I have little doubt of the same being an inherent quality of other exanthematous diseases, that were contagious before death, provided there be left any evaporable deposition or crust upon the skin. But in regard to plague, I would feel disposed to deny it altogether, unless upon the ground that matter had been formed on its characteristic plague spots, as they are called, or critical abscesses near the surface; and then I would acknowledge that their contents might be sublimed from the same causes, and by the same means as from the pustules of small-pox, the matter of which is encased in its own porous capsules, fully formed and complete as a material, is preserved in the most fitting state possible, for being diffused around, whenever acted upon by any of the above mentioned agencies. This cannot be the case in regard to the gaseous aërial contagions, where no material is discoverable, and where the very small portion that can possibly be condensed upon the corpse after death, must be so insignificant when compared with the supply that was constantly furnished by the living elaboration, as to make it almost impossible that it could constitute a focus of infection.* I shall now conclude with offering some

* Were it allowable to laugh on such a subject, the temptation would be found in the late regulations for the burial of the dead, during the recent visitation of epidemic cholera. In the north they were hurried to their unhallowed grave before the vital heat was extinguished, and, in some instances it is reported, before the breath was out of the body; but in London the Irish labourers beat off the police, and waked the corpse on successive nights with pipes and whisky. I confess, that, in as far as my own personal safety was concerned, (supposing it to have been an infectious disease,) I should greatly have preferred joining the latter party; for the

observations upon the contagion of typhous fever and contagion generally.

Could we establish the point, that this febrile contagion, unlike the poisonous leaven of the variolous fluid, or the venomous fluid of the viper's tooth, which on the reception of a particle contaminates the whole mass, is an infection of accumulation and quantity alone, we shall have attained a degree of security of nearly equal importance to mankind as the discovery of inoculation or the vaccine preventive itself. If such a result is obtained, then, instead of man constantly generating a poison which would eventually be fatal to his race, the typhoid virus, without any great stretch of fancy, may almost be taken for the monitor of his life, and preserver of his existence in its due integrity; because that accumulation and quantity, to the degree that can constitute a contagion, being incompatible with the wholesome decencies of life, ought to find no toleration in civilized communities, and may always be obviated by the simplest precautions of domestic police. When these are neglected the powers of mind and body bestowed by the Creator languish, and are deteriorated, like unhealthy plants deprived of their nourishment in a deficient soil, or of the air and light necessary to their well being; for it has been wisely ordained, that man shall use his faculties to uphold and improve the station that has been assigned to him; and the behests of Providence can never be despised without incurring the appropriate penalty in the diseases that afflict him, and the various plagues that beset his life. It will be vain for him, and his rulers more especially, to plead contagion as a predicament from which they could not escape; for that very contagion is part of their fault, being nine times in ten the work of their own creation, through default of humanity, and in consequence of their crimes. Wherever good government prevails, the worst contagion that ever appalled an hospital may be dissipated by the simple separation of the inmates; and the most saturated

waking, I understand, never begins till the corpse is cold, and, in the recently dead from cholera, the heat is said not only to linger in, but actually to return to the body after death, (*vide* Lancet,) causing infection to rise from it (if any ever existed) at the very time chosen for the ceremony of inhumation. Like the suicide and the worst of criminals, the dead were everywhere debarred the rights of sepulture in consecrated ground, to become, as invariably happened, the immediate booty of the body snatcher and the dissecting-rooms; and this cruel outrage upon the feelings of the dying, and grosser violation of the rights of the living, was, if not encouraged, too seldom opposed, as it ought to have been, by the medical profession. In politics, it has often been reckoned good to frighten the people; and despotic power has ever found its best ally in superstitious fear. But medical science ought to spurn the base connection, and should never have been seen in the ranks of time-serving panic and superstition. To have aided in such a delusion can admit of no excuse; for its abettors, before they consented, must have forgotten, if they did not wilfully shut their eyes on the evidence of every dissecting-room in Europe, which have never become receptacles of contagion, with the exception of, I believe, the small-pox, nor have their purveyors, the resurrection men, ever fallen the victims of their nefarious trade.

lazar that ever came out of a pest house may be disinfected by the burning of a basket of charcoal, putting to flight at once by this simple process the ill-omened hosts of quarantine throughout every nation, with all their vexatious machinery of imprisonment, fumigation, and delay. Too long has contagion been resorted to as the word of refuge and of fear, which, by the word alone, constantly making its own work, has slain its thousands, while it has served to hide our ignorance of what we cannot know—to clothe the medical professor with undue influence over his patient—and to exhibit himself in the unmerited character of a preserver endued with courage to confront, and skill to disarm, the unseen destroyer. Even before he can possibly have become habituated to the presumed *infectious* influences of a new epidemic by the necessity of exposure, he walks harmless amidst the pestilence, as if a miracle had been wrought in his favour; for without such a miracle he could not be saved, and never, in fact, is saved when true infection exists; the first and surest proof of its presence every where being the seizure in its worst form of the medical attendants, (in some visitations of the true plague they have actually been extirpated,) and wherever they escape in any thing like proportionate numbers to the rest of the community, the people need have no fear of contagion.*

* Besides, this argument of habituation cuts both ways, for many escape on first exposure and short visits to the sick, who are certainly infected by repeated and longer continued ones. Thus, on the disastrous retreat of the British army through Holland in the winter of 1794, few indeed of the medical staff escaped the typhoid contagion in our then most miserably conducted hospitals, before the retreat was finished; and subsequently, under a better organization on the retreat from Talavera to the confines of Portugal, when the hospitals became inevitably crowded to overflowing, it was seen that the best seasoned of the medical staff were the principal sufferers.

Thus, during the late visitation of epidemic cholera at St Petersburg, when, during the first weeks of its prevalence, 25 out of 224 medical men there were taken with the disease,—the British mission sent out by our government could not, in the first instance, while this was going on, justly come to any other conclusion than that it was a contagious pestilence, and, had the result been the same, or any thing like the same, in other places, the fact of its being a contagion could not have been doubted by any candid unprejudiced observer. It has, however, been so decidedly negatived at Moscow, Warsaw, Sunderland, London, and indeed everywhere else, as to show that the occurrence in the Russian capital must either have been a matter of pure chance, or, what is far more likely, the effect of prepossession in an ultra-contagion creed, strongly predisposing its disciples to be affected with an epidemic disease in the same way as the British troops in Cadiz, when, terrified by their own surgeons preaching contagion, became the victims of yellow fever, or resisted it, when assured and made confident under a better and truer belief. The assertion then so often made by the most influential writers, that a single case of disease making its appearance after an undoubted communication with another labouring under the same, must establish the truth and fact of contagion so clearly as to render of no avail all that the anti-contagionists can advance to the contrary, is surely unworthy of men habituated to any thing like exactness of reasoning. Take, for instance, the diseases of a malarious district, such as endemic fevers, or those of the camp, such as dysentery, or the ordinary non-contagious epidemics of any populous country, there must of necessity be every kind and degree of communication that can be imagined, and

The ancients * knew not what it was, and it may fairly be questioned, whether greater misery and danger has not been inflicted upon mankind through the superstitious dread of the imaginary evil, than security derived against the true contagions, from our improved, but still imperfect, knowledge. That knowledge, when perverted, has been found capable of most pernicious application in almost every country, and when obscured by panic, has led to the wildest inroads upon the peace and welfare of society.

The most simple diseases, and the most innocuous in respect to the community, have been proclaimed for contagious by the best physicians of the last century ; and little more than thirty years ago, my own preceptor at St Thomas's Hospital, Dr George Fordyce, the most enlightened philosophic physician of his age, taught that ague was an infectious disease. Many still believe in the infection of *phthisis pulmonalis*, and propagate that belief to the no small terror and disquiet of those families, where unhappily that deadly taint is hereditary. There are even countries of Europe where the victims of this disease, so often the young and the lovely, while standing on the brink of an untimely grave, instead of being cherished in the bosom of their families, are shut out from human intercourse, and debarred the solace of society, through terror of its contagious nature. So firmly rooted is this belief, that even after death the habitation where the ill-used victim has dwelt is declared unapproachable till it has been exorcised, as if it had been the abode of a demon—the bedding and clothes of the deceased committed to the flames,—and the walls expurgated. No native physician dares to question the propriety of these measures. It is an article of the medical creed, taught in the authorized schools, sanctioned by the church, and confirmed by the people ; and the heretic practitioner who might dare to question its truth, would meet about the same degree of toleration as if he had questioned the dogmata of the true Catholic faith.

In regard to *phthisis pulmonalis* in this country, I may at least say, that those, who act the part of the Spanish and Italian physician here, cannot have given the subject any thing like

yet with as many undeniable instances of it as can be desired, who would now venture to say that all these maladies are propagated by contagion. I am aware that not very long ago contagion was taken for granted in almost every disease by the wisest and most learned of the faculty ; but subsequent experience has opened the eyes of all impartial observers to better views of the case. It was then the creed of the times, and through the remains of that creed, and in default of experience, it is to be feared that society will still be subjected to groundless alarm on the appearance of every new epidemic.

* I speak here only of the ancient physicians, from Hippocrates to Celsus ; for I cannot acknowledge the authority of the poets, nor even that of the historians, if unsupported by the physicians in a medical paper.

due consideration ; for unprejudiced reflection would surely show them that the presence of the contagious principle, even in a limited degree, would, in this country at least, seriously affect the continuance of the human race. Let us suppose that the disease were now for the first time introduced into the British isles. Its course, however deadly in the end, unlike that of a transient acute disease, is slow and gradual, enduring for months, even for years, during which lengthened period its victims, deeply affected, continue until the last stages to frequent the haunts of society, to form part of our public meetings in churches and other assemblies. We inspire their breath, and touch their bodies. Under these circumstances, a single patient would spread the infection through a whole community—the community a district, and a district the entire kingdom, so that in a few years the British nation generally, and through them the rest of the world, would certainly be infected with an incurable fatal disease. To assume that predisposition is contagion cannot surely be warranted by any stretch of reasoning ; nor in the cases where the surviving members of a consumptive family succumb in succession under the connate vitiation, because exhausted by watching, and overpowered by terror and grief,—will it do to say, while all the other attendants so uniformly escape, that they must have been infected from the proximity of their dying relative. *

* Contagion has ever been the modern medical creed ; and the announcement of a new one, as we have lately seen in the instance of *cholera morbus*, instead of being received with becoming distrust, and strictly scrutinized, has been hailed with so little question as to make it dangerous for any one to express doubt on the subject. It is not many years ago, that a contagious *ophthalmia* imported from Egypt was then triumphantly announced. It was in vain to represent that this new disease did not break out until several years after our communication with Egypt had ceased, where it was an endemic disease, and had never been suspected to possess any contagious quality ; that in England it was altogether limited to marching regiments of the line ; that it did not affect militia regiments in the same barracks, nor the officers, nor the inhabitants of the same place when in quarters ; and moreover, had it been contagious, that there could scarcely have been an eye left amongst the medical staff of the ophthalmic regiments and hospitals, who were constantly employed in the closest and most intense examination of their patients, and who, knowing besides that there was only one infectious *ophthalmia*, the gonorrhœal, inserted the discharge into their own eyes with impunity, and published the result of the experiment. The disease, nevertheless, kept its ground, under the title of the *ophthalmia* pestilence ; its course was traced, its laws defined, and powers described, until the detection of a deeply organized *ophthalmia* conspiracy amongst the soldiers, assisted by a wise distribution of pensions, and amelioration of the mistaken discipline which then prevailed, put this Egyptian disease to flight ; and it has been no more heard of as a spreading contagion, any where I believe, except in our schools of public instruction ; for it is there that the minds of our youthful students are imbued with prejudices which stick to them through life, and impede their future progress at every step in the investigation of truth. Who would believe that the contagion of dysentery was in these schools still impressed upon them as an axiom not admitting of dispute, when the whole British army have for upwards of 30 years, in innumerable reports from every part of the world, been testifying to the direct contrary, and the veriest medical tyro, who

In this paper I trust that I can have been actuated by no motive but the investigation of truth, and when I have adduced facts, evidence, and reason in aid of that cause, I look for support and acquiescence. Should the evidence turn out groundless, and the reasonings weak and sophistical, then shall I hold myself bound to retract. My aim has been to combat prejudice, however consecrated by antiquity, or upheld by the authority of the learned; and, above all, to advocate the important truths that contagion, instead of being an all-pervading principle, is, generally speaking, a rare and factitious one; that the prevailing belief in its ubiquity is superstitious and antisocial, discreditable to medical science, because inconsistent with the fact; and that, whenever it really exists, the best security against its diffusion will be found in the well-being of the people, as well as the certainty of its speedy eradication wherever it has been introduced. *

ever served a campaign, or ever attended an autumnal encampment, on any of the downs of England, could prove from his own patients that there was no contagion belonging to it? Would any one believe that the people of England could be made to tremble with fear for the invasion of tropical yellow fever, when in the countries where it rages, there is not even a woman, a drummer of the army, who would not laugh the learned Doctor to scorn, were he to preach to them such an absurdity as contagion; the constant daily experience of their lives having satisfied them that the disease never is, nor can be, communicated from the sick to the healthy. The instilling such opinions from authority into the minds of the young, in the face of counter-evidence the most continuous, consistent, and irrefragable, because coming from the seat and theatre of the disease, is a public injury, for which learning, however great, if without experience, and intentions, however pure, if blind to and repulsive of the experience of others, can never make amends.

* In this paper the words contagion and infection have been used as precisely synonymous terms. I cannot help knowing that they ought to bear a different import, but the significations given to them through conventional usage have been so various, that, to avoid misunderstanding, I have adopted them for the same.

It may be proper to remark, in reference to the statement contained in the footnote of p. 83, that the total number of physicians in St Petersburg during the epidemic cholera was *two hundred and sixty-four*, and of these above *forty* were attacked by the disease, and *nineteen* were cut off by it. This, which gives a proportion of rather less than *one-sixth*, but more than *one-seventh* attacked, and about *one-fourteenth* destroyed, does not, nevertheless, if all the collateral circumstances be considered, so much corroborate the idea of a contagious principle as might be imagined. All these medical attendants were in the same degree exposed to the general causes of the disease as other members of the community; and when the locality of St Petersburg, the habits of the Russian inhabitants, and the annual recurrence of their endemial *diarrhœa* are considered, it is not at all wonderful that a greater proportion of physicians should have been attacked than in other cities in which these causes did not exist or prevail to the same extent. The manifold instances of the exquisite form of the disease which we have learnt took place in the Russian capital, and in which no connection with any infected person could be traced, show that the spontaneous or atmospherical origin of the disease is sufficient to account for the numbers of physicians attacked during the epidemic, or at least that the influence of contagion was not by any means a prominent feature of the epidemic. It must be further remarked, that its occurrence in many instances in the higher ranks, instead of being favourable, is rather hostile to the idea of contagion; since in these instances no communication could be traced, and no way of accounting for such attacks is left, unless imputing them to atmospherical or similar causes of very general operation.—C.



