Institutes of health : essays on constitutional peculiarities, sudden impressions, bathing, animal food, London porter and ale, digestion, dropsy and liver complaints / by John Roberton.

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INSTITUTES OF HEALTH:

ESSAYS

ON

CONSTITUTIONAL PECULIARITIES.

SUDDEN IMPRESSIONS.

BATHING.

ANIMAL FOOD.

LONDON PORTER AND ALE.

DIGESTION.

DROPSY AND LIVER COMPLAINTS.

By JOHN ROBERTON,

Author of "The Generative System," &c. &c.

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ADVERTISEMENT.

THERE are two leading principles by which a medical writer may be of service to the community, *viz.* making important practical discoveries, and leading the public attention to points very much overlooked. The following Essays bear a stronger resemblance to the latter than to the former of these; and if their perusal should induce my readers to consider such subjects more than they were accustomed to do, I shall be amply rewarded.

I have been careful to divest the Essays of professional obscurities, and unnecessary technical terms. I trust the language is such as will enable

those, for whose use they are addressed, fully to comprehend when and where they may, and may not, be advantageously adopted.

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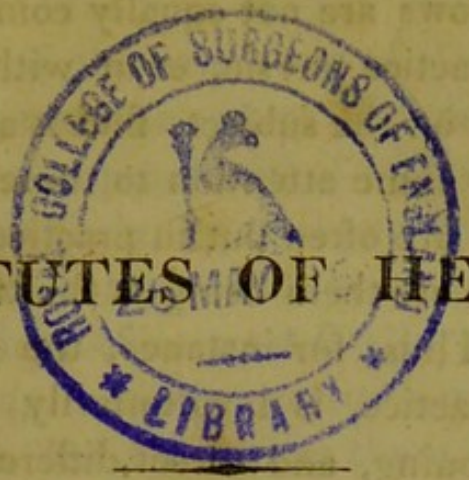

INSTITUTES OF HEALTH.

CONSTITUTIONAL PECULIARITIES.

Every particular mode of reasoning, and every particular application, made to the human body, either for the preservation of health, or for the removal of disease, must be greatly regulated by the existence of certain constitutional peculiarities, which prevent the possibility of uniform rules and universal applications being made to every description or variety of human beings. Indeed, a prudent and judicious medical attendant will ascertain every circumstance in his power connected with these peculiarities, previous to his recommendation of any means he may judge proper for the continuance of the comforts of health, or for the restoration of that health of which the individual is deprived.

Thus the seemingly same sort of diseases, of the various descriptions of human beings, to be met with in the world, from the naked savage to the luxurious citizen, are characterized by certain individualities, I would call them, which,

every one allows are not equally common to both. Many who practice physic, even without attempting to reason on the subject, find it absolutely necessary to pay some attention to these peculiarities, and thus they are often put in practice, even without those who use them being at the trouble to consider why. Thus, for instance, the greatest tyro, in medical practice, is involuntarily led to apply different reasoning, and direct different practice to one debilitated by previous debaucheries, by fever, and certain other systematic affections, to what he would have employed to the same individual while in the vigor of health.

Every morbid state, therefore, of every organ of the body, is often widely different, in different individuals, as well as in the same individual at different times, and under different circumstances; and these certainly exist, in a more marked form, from presently existing, or from permanent peculiarities of constitution, than from the various nature of the external causes of disease. To be successful, therefore, in our treatment of these various states, we must proceed differently in each, both in regard to the immediate circumstances of the constitution, as well as of the disease itself.

Certain general rules, in practice, may doubtless be followed, and uniform results may, to a certainty, often be calculated on, from the adoption of certain uniform plans. Thus, hunger is removed by the use of food, and constipation by the use of purgatives, but such generalizing plans must entirely cease when we consider the various states of action which human nature assumes, and also

the difference in some of the more important features, even of the same sort of diseases, which occur in the immense variety of individuals, each guided by his own peculiarities. Thus it would be the very highest absurdity to suppose that we could always conduct our proceedings by general rules, unless in proving, often most fatally, that we were generally wrong. Such practitioners in physic, however, exist, and I am sorry there are not fewer of them; they ought, indeed, in justice, to stand no higher in reputation than he who makes a box, or forms a brick in its mould.

Every one, I dare say, is aware that there are particular individuals, whose constitution, or, in other words, peculiarities, is, from the commencement of their existence, much more subject to one kind of morbid affection than another, at least to one particular class of diseases, whose distinguishing features bear some resemblance to each other, rather than, in general, to all such as those who are constitutionally scrofulous, consumptive, &c. Indeed I think a somewhat similar rule may be applied to the whole existing mass of human beings. If, for instance, we expose certain persons, with no evident external peculiarity about them, to the influence of certain kinds of contagion, they escape untouched by it, as regularly as the scrofulous, or the consumptive, are affected by these particular diseases when exposed to the influence of their exciting causes; and, although many susceptibilities, or peculiarities of constitution, undergo certain occasional changes, no

change of any description, in their progress through life, seems to alter the susceptibilities of those scrofulously, or consumptively disposed. Similar peculiarities render one person more liable to be affected with ague than another—various persons exposed to variolous contagion; while some altogether escape, others are differently affected in degree; different persons, although bit by the same rabid animal, some are affected with hydrophobia, and some escape; and, from similar circumstances, while some are frequently and severely affected with venereal infection, others are either affected mildly, or even set such infection at complete defiance. Certain other peculiarities exist in individuals, which, although of great importance in our consideration and treatment of their diseases, are not so formidable in their nature as the above. Under these may be placed all those susceptibilities to diseased action which arise from particular changes of the seasons, the changes of weather in particular seasons, and also from the use of particular kinds of medicines, food, and the ingesta in general.

In almost, or perhaps in all instances, where a person does not die by sudden and accidental injury, or from natural decay, who escapes dangers under which the majority sink, he possesses a peculiarity of constitution calculated to resist those diseases he escapes, although exposed to their influence, and is only materially, if at all, affected by such as he is predisposed to, or which are most likely to affect his existing, or permanent

peculiarity of constitution, when circumstances place him within their influence. Indeed, were this not the case, we should find that one cause of malignant disease would equally affect every one exposed to it, but this never did, and probably never will happen.

For my own part, I conceive that the various peculiarities, both in the appearances of disease, and the method of treatment, include the only scientific and truly philosophic measures which can be adopted in our art. Were, therefore, more attention given to these individual points, at least one half of the medical periodical journals, &c. would *die a natural death*, for then we should hear much less of curious cases, curious occurrences, and remarkable circumstances, in our observations in, and treatment of disease, than are now found to load the shelves of booksellers. Our attention, however, not being properly directed to these peculiarities, medical reasoning becomes proportionably of no use, and our most skilful practice in disease is at best a mere mechanical trade; because in every systematic work we have diseases most methodically and formally detailed, and, in every pharmacopeia, the regular doses of medicines are as methodically enumerated, so that, but for these peculiarities of hourly occurrence, we could never possibly go wrong, as certainly as without attending to them we can never possibly go right, in our opinions concerning either diseases or their treatment. But for these, indeed, what would be the use of study and reflection?—what the use of attending to those laws of the animal

economy, to the various conditions of human life which are perpetually deviating from their healthy state, and which, of course, require to be treated by particular plans suited to the nature of such deviations? From these matters having been often neglected, however, we have had many wranglings, productive of much amusement (except to the parties concerned) in every period of the history and practice of medicine. Such men wish for proofs from their adversary, while, from their generalizing plans, they themselves are unable to prove any thing beyond the most invariable, and, of course, the least useful facts in medicine. Indeed the impossibility of adducing proofs in the more philosophic parts of medical reasoning and practice, is proverbial, because these peculiarities being little, if at all attended to, some instance of the kind has been brought forward to prove the want of universal application of such facts as seemed built on an apparently firm foundation.

ON

THE EFFECTS

OF

SUDDEN IMPRESSIONS,

APPLIED TO

THE HUMAN BODY,

IN

HEALTH AND DISEASE.

SUDDEN impressions, applied to the living body, in that state which we term health, provided their extent or degree be greater than the regular actions of the animal economy, are always calculated to induce disease; and this rule invariably applies, not only to the physical powers, but to all our organs of sense, and also to the operations of the mind. During, however, a great proportion of diseases, especially those of a systematic kind, it is only by such external or internal applications, as operate more forcibly than the natural actions of the healthy body, that they can be destroyed and health restored.

In conformity with the above principle, we find that every suddenly adopted extreme is an enemy to health, and therefore every individual part of the animal economy possesses a natural power of resistance, which repels, or, at least, receives such impressions with reluctance. No sooner are these

parts suddenly or violently assailed by external applications, by foreign matter introduced, or by any part of their own structure having become unable to perform its natural functions, than such resistances are in instant action to repel, or destroy whatever had a tendency to alter that economy to which they had been naturally and long accustomed.

A moment's reflection will convince us of the propriety, and even necessity of great caution in these matters; for nature does nothing hastily, and, as we act only as agents of nature, to do right, we must use similar measures in conducting all operations in which nature is principally concerned.

We may observe to what an amazing pitch of strength every function may be brought, by slow and gradual application. Thus the thick and muscular form of a rope-dancer's thighs, and the arms of a pugilist, are wholly formed by gradual use in their different employments; and, indeed, their strength has at length become so great that the fatigue they could undergo actually becomes an object of amazement.

While such changes are only occasioned by slow gradations, the following examples will illustrate the impropriety of adopting other measures.

Any person *suddenly* drinking a much larger quantity of intoxicating liquor than had been habitual to him, feels much more intoxicated, and his injured powers of digestion much longer of resuming their usual health, than if he had gradually taken the same, or even double the quantity.

One bottle of wine will produce intoxication, where no such quantity had formerly been used at once; and even half that quantity will produce a similar effect in the same individual, if taken at one draught. A person also in the habit of using two or three bottles of wine at one sitting, without suffering from intoxication, would soon tumble from his seat were he to take one half of that quantity at a draught.

Thus, also one man, who may not perhaps be *tipsy* more than once a year, will suffer greatly in general feeling, appetite, &c., while another in the constant habit of using a full proportion of inebriating liquors, will have his powers of digestion and general feeling preserved in good order, often for many years. In the first, the shock given to the system was violent and unusual, and it felt and shewed its effects; but, in the latter, these vitiated habits had been gradually acquired, and, therefore, did not immediately shock, but continued, by slow degrees, to wear out the principles of life.

Thus also a sudden blow, externally applied to the stomach of a person in health, may instantly kill him; yet, it is truly amazing to what an astonishing degree of disease that organ is capable of being gradually reduced, without occasioning immediately dangerous effects.

On the same principle the *tendo-achilles*, and other tendons of muscular parts, are snapt asunder by sudden force, (which, indeed, does not require to be very violent) while, to effect the same purpose, by a regular and gradual pull, would require an amazing power.

Neither does this particular quality of matter exclusively belong to the living body; all inanimate substances are similarly influenced, for we find that a sudden impression will destroy their texture, while the same, or even a much greater force, gradually applied, will be sustained without their organization being in the least affected.

The previous circumstances are applicable to particular parts of our physical structure, and we shall find that similar reasoning may be used in regard to the whole body. Thus, in suddenly changing our situation for one, in many respects different, the inconvenience, or even danger, is almost exactly in proportion to the rapidity of our change. Rapid changes of climate are involved under this rule, because those who do so are affected in a manner somewhat analagous to that of plants suddenly removed to a foreign soil. Europeans in warm climates, especially those who take little care of themselves, in their new and unaccustomed situation, but suddenly adopt intemperate habits, are particularly subject to the prevailing diseases of such climates.

It is this also which preserves him from agues and intermittent fevers, who almost constantly works in the marshes and fens in our own island, while those who are occasional visitors to such places, or only casually exposed to their influence, are almost the certain victims of such complaints.

From sudden and injudicious changes in living, while the health apparently remained sound, I have met with more irreparably broken constitutions, than from almost any other cause. From an idea

(false, or true, I care not which), that gout, or apoplexy, or some such terrible enemy to the continuance of human life, was lurking in the constitution, many individuals, who had previously *lived freely*, having unfortunately of themselves, but more frequently by desire of their medical attendant, suddenly become, what is termed, *water drinkers*, have not required to live much longer to feel that such sudden alteration in living has so perfectly unhinged the whole economy of life (for we are really creatures of habit), as to prove more irreparably hurtful than almost any disease to which the human frame can be subjected.

The following instances will sufficiently illustrate the foregoing observations.

A gentleman sent for me professionally, because, from a trembling in his hand, he was terribly alarmed lest he should be affected with paralysis, or might suddenly die of apoplexy. He was about thirty-five years of age, and had lived a very wild and dissipated life, although his health had scarcely ever suffered any particular derangement, and consequently this trembling of his hand, being about the first symptom of disease he ever experienced, alarmed him exceedingly. After conversing with him for some time on the subject, he suddenly started from his chair, and, pacing his chamber, exclaimed, "Now I know the cause of this. For two days past I have drank no wine, because my old dotard of an uncle moralized with me on the impropriety of using so much, and that is the cause of this shaking of my *fist;* but, were it to please the Pope, I shall never, while I live,

do such a foolish trick again." He had a great aversion to every sort of medicine, and consequently took none, but, being what is termed a three bottle man, he recurred to his usual habits, and almost immediately the shaking of his hand abated. To trace the existence of this individual a little further, his appetite for food, except such as was very highly seasoned, soon failed, and, in a few years after, his life seemed principally supported by the use of wine and brandy. This did not last long, for soon after, although he went to bed in his usual health, the servants found him dead in the morning.

I knew another gentleman, in the northern part of our island, who had been long in the habit of using very great quantities of ardent spirits, so that, at length, he was actually under the necessity of having frequent recourse to the *whisky* bottle, in order to prevent the very moderate quantity of victuals he used from being ejected by vomiting. He applied to a very celebrated medical gentleman there, whose uniform practice is, be the existing habits what they may, or in whatever state of disease he may be consulted, instantly to forbid the use of every kind of stimulating liquor, and who usually ushers in the propriety of his practice by such dreadful stories of mortification of the bowels, and God knows what else, that his patients are glad to adopt any measure he may propose, rather than be the hero of such unheard-of miseries. The gentleman was, of course, instantly deprived of every sort of stimulating liquor, so that barley-water, dry toast and coffee, constituted all the

luxuries he was permitted to indulge in; and this course of living was peremptorily and instantly insisted on, although, for years, he had been in the daily habit of using from three half pints to a quart of ardent spirits. The consequence was that every thing he took was instantly vomited, notwithstanding the frequent doses of opium which his celebrated medical attendant now thought would effectually allay the *irritation* of his stomach. He was, at length, greatly reduced in bulk, and his wardrobe hung so reluctantly about his shrivelled form that he could scarcely be recognized as the being who, a month or two before was apparently stout. He was also reduced to such debility that he was actually unable to support himself in a chair, in an erect posture. He soon became greatly alarmed, and naturally possessing much vivacity, which, even in this state, did not wholly desert him, he exclaimed, that if he was to die he would not die of starvation, but make his exit *like a gentleman*, by which he meant that he would prefer to die drunk! Although, however, his usual habits had been of the most depraved kind, he was occasionally capable both of listening to reason and of reasoning himself. In one of his lucid intervals, therefore, he was advised not promptly to re-adopt his former habits, in regard to the use of ardent spirits, but gradually to increase the quantity of such stimulating liquors, till he advanced to nearly his usual proportion, before he adopted the plans prescribed by the above *celebrated physician*. In the course of a month he was nearly in the same state as before he applied for medical aid.

About this time, at a full tribunal of his relations and friends, it was recommended to him to adopt rather a curious plan, but which proved, in the sequel, very beneficial to him. His usual custom was to drink the ardent spirits without any kind of dilution, as he remarked, that when mixed with water, *it soured on his stomach!* He was, therefore, allowed to use it in his favorite way, but with the condition that, at every wine glassful he took, (for he was always to drink out of one glass) he should stick an additional piece of bee's-wax, about the size of a very small pill, on the bottom of his glass. In this way the capacity of the glass was very gradually diminished, till, at length, the quantity of the spirit he used daily was not more than might be contained in an ordinary sized wine glass. By this plan he suffered no inconvenience, but, on the contrary, felt better than he had done for many a day. About this time a curious circumstance also occurred in the economy of his stomach—he felt, for the first time for many years, that he could use the spirit in a diluted state, that his nights' rest was more refreshing, and he could eat his victuals with greater relish. Still, however, in defiance of every measure which could be adopted, his stomach continued very weak, and this state was always increased by agitation of mind, or by exposure to cold and wet. He now scarcely ever exceeded in the use of spirits, and the little deviations he made from sobriety were with spirit in its diluted state. Upon the whole, he lived much more comfortably than he had been in the habit of doing; and, when I saw him last,

he seemed firmly resolved never to indulge in those irregularities which had occupied so much of his former life, and almost completely destroyed a robust constitution.

These cases show that even those habits, which are of themselves bad, should only be relinquished by very slow degrees. To prevent bad consequences, therefore, caution and prudent discrimination become absolutely necessary, for without them, all our measures must, even at best, be accidental, and such accidental proceedings and accidental results, may produce effects from the slightest shock of the system, to that of instantly arresting animal existence.

There is an anecdote related of a certain military character, of bacchanalian celebrity, which places in a very proper point of view, the great propriety of rather continuing, under certain circumstances, to pursue objectionable habits, than suddenly to relinquish them for what, in the general acceptation of the term, are deemed proper. This brave officer was wounded in a contest which crowned the British arms with unfading honour, and was soon after waited on by the surgeon. The wounds being dressed, his medical attendant, doubtless influenced by motives which he deemed correct, assured his patient that he must now, instead of indulging in his former habits of drinking deep, (for he was, what is termed, a three or four bottle man) in that hot climate, and in such a condition, confine himself to one, or at most, two glasses of wine daily. Fully aware of the hardship of such instructions on his patient,

the surgeon anxious that such should be obeyed, begged of him to give his word of honour, as a soldier, that he would drink no more wine than at most two glasses daily. "Well, doctor, replied his patient, since it must be it must; and I give you my word of honour, I shall confine myself to two glasses daily."

The doctor frequently visited his patient, and reminded him of his promise, which he was assured was inviolably kept, and, finding the wounds mending, he expatiated on the praises of sobriety, and assured his patient that, to nothing but the change in his living, was he now indebted even for his life—that indulging in the use of a pint of wine daily would to a certainty have been attended with the most fatal consequences. The general reply to all these harangues was, "very well, doctor, very well—you must know best." At length the wounds completely healed, and the doctor insisted on the rigidity of his former instructions, and still harangued on the absolute necessity for the strictest abstinence in such cases. The officer told the doctor that for all these good and seasonable advices he felt grateful, and now that his wounds were healed he would not only indulge himself with an extra glass of wine, but begged the doctor to partake of a few glasses of some which he could recommend. The servant was desired to bring a couple of glasses of wine, one for the doctor and one for himself. The servant speedily returned, puffing and blowing, under the oppression of a waiter, on which was placed two glasses, each containing fully a quart and a half of wine! "These, says the officer, are

my glasses, doctor; and, on the honour of a soldier, I have drank no more than two glasses of wine daily during my cure."

In this instance there can be no doubt that, had the officer so suddenly altered his plan of living, from about four bottles daily to two glasses of the usual size, this too sudden precaution would as certainly have killed his patient as if an eighteen pounder had gone through his head. The officer himself, perhaps, did not reason on the subject, but, not caring a straw whether he died or not, was determined, while he did live, that he should follow such plans as had often yielded him comfort, and from which he was determined never to depart.

With regard also to the organs of sense we know that a sudden glare of light, to which the eye had been unaccustomed, will cause temporary, if not even total blindness—the ear also is similarly affected in its functions, by sudden and tremendous sounds, and the smell, and sense of touch, on being suddenly assailed, are both similarly influenced.

We also find that sudden or violent impressions on the mind, produce equally inconvenient if not dangerous effects. It is from this cause, in general, that hysterical affections are so frequent among delicate females, and some, from similar causes, have been driven into a state of delirium, and even sudden death. In such instances of fatality, the effects have not even ceased at the death of the individual, for the rapid putrefaction, into which such bodies run, is truly wonderful.

We are insensibly led to the propriety if not the necessity of attending to such circumstances in respect to the mind; for when we have any wonderfully important intelligence to communicate, or melancholy event to relate, we do not choose a fellow who will go blustering forward and instantly reveal all which can be said, but we select a cautious and sedate person, who gradually and judiciously unfolds one part of the circumstance after another, till he has disclosed the whole. It is thus that the most dreadful catastrophe, which can befal human nature, has been related and listened to with almost perfect composure, while a more abrupt disclosure of similar facts, might have been followed by the most serious consequences.

Although, also, these violent impressions, exercised in the mind of very young persons, in the form of scholastic tyranny or cruelty, invariably make them conspicuous, in after life, only for their imbecility, we have, in every age, had the most marked instances of the wonderful pitch of maturity to which the mind of a very young person may be gradually trained. In the present age many such instances have occurred. The boy lately exhibited in public, for his wonderful power of calculations—the extraordinary imitative and musical talent of Miss Paton, even when an infant, and the equally extraordinary and accurate delineations of human nature, which were performed, in such a matchless manner by Mr. Betty, the Roscius of the day, are striking examples of this.

In all these facts, and, indeed, every one which may be adduced, as relating to the operations of human life, the same principle prevails that slow and gradual training will preserve and even conspicuously improve our every faculty, both physical and mental, while sudden or violent impressions are always improper and often injurious to health.

The effect of these sudden impressions, however, will admit of a very different view when applied, during the existence of certain *systematic* diseases. It is, indeed, under their judicious application that the most miraculous recoveries have been effected in maladies of the most distressing and dangerous nature, and on this principle cold, in febrile complaints, has proved so conspicously beneficial, and places the name of the late Dr. Currie so high as a man of science and a philosopher.

In their power of arresting diseases, of another kind, a medical friend, whose veracity I never had any occasion to question, related a curious anecdote of himself. He was surgeon on board one of his Majesty's ships, stationed off one of the West India Islands, while the country fever was very general, very destructive, and almost certainly fatal, in the course of a day or two. In some of these ships very little attention is paid to those delicacies, without which persons accustomed to the drowsy couch of luxury and ease, cannot exist. The ship, to which my friend belonged, was one of these, and no sooner was any of the officers seized with the fever than they were supposed irre-

coverably lost, and the survivors balloted, perhaps in the presence of the sick, for possession of the bed or birth, as they call it, on which he lay, when, in the course of the following day, he should be thrown overboard. My friend was seized with the fever, and the ceremony of balloting was actually performed before him, while he lay in bed. In health he was possessed of a courageous firmness, a total stranger to fear, but he afterwards confessed that his sensations, on seeing this balloting, were such as he never had felt before, although he himself had often been one of the party at such previous ballotings, which he went through with the most perfect indifference. He had long been accustomed to the free use of stimulating liquors, though never to such extent as to injure his constitution, and when left alone, after the ceremony of balloting, he was determined to have, as he termed it, a *tough glass of grog*. He recollected that there was one bottle of rum, and one of wine, in his *locker*, at the foot of his bed, and as he thought the usage he had received from his shipmates, by no means pleasant, he resolved, if they did inherit his bed, they should, at all events, get as little of the rum and wine, as he thought them entitled to—in other words, that they should get none. With much difficulty, therefore, he scrambled down to the *locker*, at the foot of the bed, and carried both bottles up with him. When he had recovered the fatigue of this exertion, he alternately applied his mouth to each bottle, and, by steady and determined perseverance, he finished their contents with wonder-

ful rapidity, as his principal fear now was that he should die before they were done! By the time they were finished he did not feel much intoxicated, but a profuse perspiration began to break out all over his body, and he afterwards used to say, that then only he regretted to feel himself fast dying, as he deemed this perspiration favourable. It seems, however, he had only fallen asleep, in which state he continued for a considerable time, for, when he awoke, he found the *wags* among his shipmates, preparing to make the *last trial* of his being alive. This consists in thrusting a large sail-cloth needle through the cartilage of his nose, and if the subject thus operated upon shows no symptom of disapprobation, he is pronounced perfectly and lawfully dead. A large shot is instantly fixed to his feet, and he is thrust out at one of the port-holes. This, however, he prevented by showing the most marked signs of disapproval of their intentions, and, of course, he escaped, and soon recovered his wonted strength. On first opening his eyes, however, he actually believed himself an inhabitant of some other world, and he felt no small degree of consolation in finding some of his balloting friends, especially he to whose lot his bed had fallen, in as bad a plight as himself. A short time, however, convinced him of his mistake.

In the same ship there had not been one instance of recovery, from such severe symptoms, from the time the vessel was put on that station, and consequently, we have every reason to believe that the violent impression applied to his system,

by the rum and wine being greater than, or at least, of a different kind from that action which constituted the disease, that peculiar action overpowered the other, which existed in the form of fever.

Many stories, also, have been told of the wonderful effects of sudden impressions, in the recovery of those who had long been confined to bed, from which it could scarcely be expected they would ever come alive. I once witnessed one of these wonders, in a country town, in the west of Scotland, where I lived during the earlier years of my life. The circumstances of this case were so distressing, and they impressed my mind so very deeply at the time, that I believe it impossible for me ever to forget them. The wife of a very poor shoemaker, by whom he had a large family of young children, was affected with fever, which successively visited almost the whole family. The husband even while they were in health, was, by his greatest toil, scarcely able to procure them the coarsest and most common means of existence, and consequently, during this state of disease, his difficulties, and their wants, were greatly increased. Some of them died, and others recovered, but still the mother of this afflicted family never could acquire strength sufficient to leave her bed. In this state she continued several months, with the exception of perhaps once a week, when being partly carried by her husband, and partly supported on two crutches, she was able to sit by the fire for half an hour or an hour. It was about this time that their house took fire, and the flames were fast approaching to the apartment in which this

wretched woman was laid. The circumstances of the fire were of such a nature as to prevent the possibility of any assistance, and this poor woman was left to perish in the flames.

To the astonishment of every one, however, she was discovered coming from the burning house, without assistance from crutch or any thing else, but such as she could procure by holding against the wall, in her descent to the street. With great difficulty she emerged from this perilous situation, and, from that hour, she gradually recovered strength. I frequently saw the woman, after this miraculous recovery, and understood that she resumed her health as perfectly as it had been previous to her being seized with the fever.

With the foregoing rules as our guide, we have a general principle before us, in whatever relates to our management of health and treatment of disease.

BATHING.

It would be altogether foreign to my purpose, to enter into a consideration of all the diseases in which bathing, either generally, or locally, has been found of advantage, in the restoration of health. What I have to say shall not be long, because there are plenty of detailed treatises on that subject already, and as some of the circumstances, under which I recommend it, are often overlooked, I hope their application will be found of benefit.

Every animal secretion, when once it has been thrown out upon the surface of the body, if not speedily separated from that body, acts as a foreign substance; its removal, therefore, is proper and even necessary. It is proper in so far as it contributes to cleanliness, and necessary as it tends to the preservation, and sometimes to the restoration, of health. Matter which has been perspired, from the extensive superficies of the body, is of this description, and, unless removed, is speedily subjected to the action of the numerous absorbents of the skin, and must always prove less or more injurious to the health of such individual, in proportion to the state of his constitution, or of the vigour of the cutaneous absorbents at the time. Bathing also preserves the softness and flexibility of the skin, contributes to general cleanliness,

and consequent comfort, and even to bodily elegance.

Wherever bathing can possibly be procured, especially by the inhabitants of crowded cities, provided it agrees with the constitution of the individual, it ought to be occasionally used during the greater part of the year. In certain climates, where the perspiration is profuse, and where cleanliness is found absolutely necessary to health, as well as to comfort, the frequent use of the bath is indispensable; while, in the climate of Britain, although perspiration be less profuse, no one can have adopted it without having experienced its often surprisingly exhilarating effects. Bathing, indeed, although merely an external application, has often a wonderful influence, in the removal of disease, even from some of the most internal organs of the body; and where no disease exists it is useful as a preventive. In whatever way bathing may act, besides cleansing the skin, causing such sensations, and also such beneficial alterations, becomes a matter of secondary consideration—we possess the fact that it is useful, and, therefore, it ought to be much more generally employed than it is.

While certain individuals are extremely fond of bathing, others cannot endure it, and the effect of the bath, in those so differently constituted, is very conspicuous. Indulgence in certain natural inclinations, has often been found of very great benefit, while forcing any one, in whatever way, is often productive of harm, and never can do good. We may apply this principle to bathing, and, be

the necessity ever so great, if the individual feels an involuntary dislike to it, the benefits we expected, from this application, may long be looked for, but will seldom, if ever, be realized; while our obstinate perseverance in the use of the bath, because it is usually invigorating, has often been productive of much harm. This rule, applies to every age, sex, health, and condition of life, and even in infancy, while some evidently show that they are pleased with the bath, and, therefore, are benefited by it, others scream at every attempt to use it, and are, therefore, less benefited by it, if not injured.

The temperature of the water is generally a matter of consequence, even to the feelings of the person who uses it; but, from this, there scarcely ever arises injurious effects. The bad consequences supposed to have been produced by the coldness of the water, may almost always be traced to the particular state of the body—such as going into it when either *very much cooled*, or when *recently* in a state of profuse perspiration. There is, however, a considerable difference between warmth of the body, and that state of the skin which immediately produces, or has very recently produced free perspiration. Thus it is perfectly safe to go into the cold bath, at any temperature which may be agreeable, while the body is *hot*, from whatever cause, that heat may have been produced; but, while the body is in a state of perspiration, or even if the perspiration have subsided, provided the skin be in the same or nearly the same state of action, during which the perspiration existed,

then immersion in the cold bath is extremely improper. From inattention to these circumstances, many have suffered severely by the use of the cold bath. Their previous exertion in walking, riding, &c. may have occasioned perspiration—they remain near the bath till the perspiration has abated, not recollecting that it is the existing condition of the skin, and not the perspiration *alone* to which attention ought to be directed, and that the state of the skin, which produced the perspiration, alters but very slowly, and continues susceptible of bad effects from the cold water, long after the perspiration itself has entirely abated. Much mischief has often been sustained from these neglects, even by those who, *in general*, derived much benefit from bathing.

Sudden immersion in the water, whatever other good effects it may produce, certainly renders our continuance in it much more pleasant than when we go timorously and slowly into it, so that the whole body has scarcely been immersed when it is time for us to leave it. The application of the water to the head, as soon as possible, is very proper, and certainly, in a very great many instances, such a mode of procedure has not been followed by headache, which uniformly followed when the head was either wetted late or perhaps not at all. It has been alleged that it is owing to this very circumstance that the shower bath is often preferable to any other, and doubtless, in a great variety of instances, this is the case.

The time of remaining in the water must be wholly regulated by the existing condition of the

individual's health, strength, and particular feelings. The healthy and robust, who are bathing for amusement, or solely for cleanliness, may remain in the water a considerable length of time, perhaps ten or fifteen minutes; but, even with these, the time must be regulated by their own feelings of vigour or approaching exhaustion; and, on no account, must *any one* remain after the slightest feelings of the latter state. In those who use the bath medicinally, the same rules must always be strictly attended to, and with such, in the generality of instances, the time of remaining in the water is much shorter—indeed, merely plunging into the water and leaving it, is generally the best plan.

With regard to the temperature of the water, that, for the robust and healthy, is of little consequence, so that he studies his own feelings, as some are most comfortable when it is almost as low as the freezing point, while others give a preference to it at from 60° to 70°. The infirm, however, must be more careful, and, in such, neither of the extremes seem to answer so well as a medium temperature—perhaps about 50° or 55°.

Although we occasionally meet with certain individuals, who cannot use the cold bath, these are but few in number, compared with the bulk of mankind, who derive the greatest benefit from it. In those with whom it disagrees, the full glow of heat, which ought immediately to be felt on their leaving the water, is, of course, absent; and instead of that, a chilly disagreeable sensation is experienced, for a considerable length of time after-

wards. In a great proportion of these, however, by whom this unpleasant sensation is experienced, it is solely owing to the cold being too intense, for the particular individual, or perhaps he has continued too long in the bath, and, under these circumstances, the cold bath is more apt to debilitate, or irritate the body, than to invigorate it.

Certain constitutions accord best with the cold, others with the warm or tepid bath, and to counteract these peculiarities, to suit any preconceived notion, either of the individual, or his medical attendant, can never be of service; but must, almost always, be injurious. Many attempts, however, of this kind have, and even now, continue to be made. Some, for instance, from an opinion that the cold bath is the most invigorating, and, therefore, ought to be preferred, at its every application, see that it does not agree with the individual to whom they recommend it, but still continue determined to make it agree. For this purpose they heat the water to about 80° or more of Fahrenheit's scale, and, at each application, they reduce it two or three, or perhaps more degrees, till they bring it to, what they conceive, the invigorating point of coldness; but, in such individuals, most probably, the invigorating point was about 90° or 96°, and every degree of cold, below that, produced a depressing effect. The same rule may apply to the use of the tepid bath. Doubtless, therefore, the bath, either cold or tepid, which agrees best with the individual constitution, acts as a tonic, and, were the human body so constructed, that the external, and probably wholly

mechanical application, could be made sufficiently long, and provided we could calculate the exact tonic power which it imparted, we might, by it alone, invigorate the debilitated system in a wonderful, and even in a permanent manner. From the limited time, however, which must necessarily be employed at each bathing, and, in common with every external application, from the impossibility of ascertaining the quantity of tonic powers it imparts, we must still, useful as it is, consider it as only a secondary remedy, beyond that of keeping the body clean, to those which produce their effects through the regular medium of the animal economy.

Count Rumford's experiments show that a warm bath at 96° of Fahrenheit, instead of debilitating the system, as has been asserted, invigorates the body in every respect. In this, of course, he alludes to those with whom warm bathing agrees. He further states, from experiment, that cold air, either damp or dry, produces no disagreeable effects, when applied to the body immediately after the warm bath has been used. All rules, in bathing, however, must remain subordinate to constitutional peculiarities, and all local, or general external applications, subject to such means as act on the body, through the medium of the animal economy; and in proportion as we attend to, or neglect, these circumstances, we shall be successful or unsuccessful practitioners of physic.

Besides all natural peculiarities in bathing, there are other occasional peculiarities, which ought never to be overlooked. I happened once to witness a

very striking instance of this in a gentleman, to whom cold bathing was both agreeable and useful, and who was in the frequent habit of indulging in it, from having formed an opinion that it was beneficial to his health. I was bathing in the next machine to his, and observed that, on his getting into his machine after bathing, he fell down on the floor, which induced me to make inquiry if any thing was wrong with him. Receiving no answer, I leaped into his machine, and found him in a state of complete insensibility. His whole body seemed very red, as though an eruption covered its surface. It occurred to me that taking some blood from him was the only means of saving his life; but I had no instrument. No time was to be lost, and searching the gentleman's pocket, I found a penknife, with which I opened his temporal artery. The force the blood issued with, was truly amazing—I never saw any thing like it either before or since. I allowed it to flow freely, and when there had been discharged, about two pounds, for I could not accurately say, as it was scattered about the machine, the redness of his body began to abate, and when a considerable quantity more had flowed, he showed some signs of life, of which, indeed, I had almost despaired. In the course of about an hour, he was able to go home in a carriage, and, in the evening, he informed me of what he supposed to be the cause of his misfortune. He had, on the preceding evening, been in a state of extreme intoxication, having drank, for his own share, full three bottles of port wine, and, as bathing had always

agreed with him, he conceived that the effects of the night's debauch might be removed by it. It is evident how far he was mistaken.

A friend of my own informed me that, a few years since, after having been *tipsy* over night, he went into the bath early in the morning (he also had been in the habit of bathing with the best effects), but he soon felt so faint that he was forced to leave the water. He, however, did not feel better, and he sat, by the water side, for nearly an hour, being quite unable to dress himself. Having no person to assist him, he at length, made a great effort, and, after many pauses, and much distress, he dressed himself and proceeded homeward; but he did not recover his usual health for a whole day. It was not likely to be the wine he had taken which caused this, for it was good of the kind, and he had and has since often taken more, but never felt so at any of these times.

These circumstances shew that it is, at all times, proper to pay much attention to these peculiarities, as, by overlooking, or treating them lightly, much mischief may sometimes be sustained. I have no doubt that it is, in some measure, owing to circumstances of a somewhat similar kind, that cramps, colics, and other morbid affections are often experienced by bathers.

The degree of timidity which certain individuals feel, on going into the cold bath, is almost incredible. I know a gentleman who is a singular proof of this. One cannot, indeed, suppress the risible faculties, to see with what caution he slowly advances, inch by inch, into the bath, while he

seems to shake with terror, if the water advance higher up his leg than he expected. Yet, strange to say, this very man, who belongs to the army, is one of the bravest fellows that ever marched into a field of battle. He has frequently been exposed to, but was never known to shrink from, the most imminent danger to which his duty called him; and I have heard him say, that rather than leap into the cold water, head foremost, as he had observed many do, he would, without hesitation, march into that field of battle, from which there were many chances he would never return alive.

Some have considered that cold bathing ought never to be used while the body is in a growing state, because they imagine that it *hardens the skin!* and gives a preternatural vigour to the body *before its time!!* One fact is worth a thousand arguments; no one, I believe, who has witnessed the effects of bathing, in those with whom it generally agreed, ever observed either this imaginary hardening of the skin, or premature vigour. I mean bathing, as it is generally used, in *clean water*, not among *mud* or *gravel*, for they may harden the skin by their mechanical friction; but how far such bathing would give preternatural vigour, I am unable to say, not possessing sufficient facts to enable me to form an opinion!

In some instances, from particular states of health, the general bath is improper, and even hurtful. There may also exist certain objections to general bathing, from particular diseases, or it may be simply hurtful from the heavy pressure of the water, compared with the aerial pressure on the

whole surface of the body. By such persons the shower bath, from its comparatively partial application, or the air bath, which is simply the free exposure of the *whole* body to the atmospheric air, (not to a current of wind) may often be used with decided advantage.

Where bathing, either hot or cold, is individually inadmissible, much benefit may be derived by washing the body all over with a wet sponge, for this, while it seldom disagrees with any one, removes the perspired matter from the skin, which the skin itself could not throw off, and I have often known this afford singular benefit, where general bathing, as usually practiced, rendered the individual extremely uncomfortable.

Under whatever circumstances, or in whatever form, bathing may have been used, to dry the body well after it is very necessary. This being performed by means of a rough cloth is perhaps preferable to any other mode, as two purposes are effected by it—we dry the body, and, by the friction of rubbing, we produce a warm glow, or, in other words, increase the circulation on the superficies of the body, which is always comfortable, and is, especially in the infirm or aged, of considerable use.

ON THE

NUTRITIVE PRINCIPLE

OF

ANIMAL FOOD.

THE nutritive principle of all animal food is pure, in proportion to what the animal fed on, its age, exercise, and the state in which it was killed. Thus, all herbivorous animals are preferred, as food, to the carnivorous; and such as are quickly killed are preferred to those which, by hunting, or slow and continued torture, have had their lives painfully protracted.

All animals also under maturity, such as veal, lamb, chickens, &c. although gelatinous, tender, and easily digested, do not possess their full nutritious properties; while those beyond maturity lose their natural healthy redness, the fibres become condensed and shrunk, and thus, it not only becomes deficient of nutritious matter, but is also difficult of digestion. We find many persons, whose stomach can digest full grown flesh, such as mutton, beef, &c., with perfect ease, in whom, young, or old animal food, or any dish made from them, produces uneasy sensations in the stomach.

Owing to these different conditions of animal food, we find the gravy, or fluid, separated in cooking, different both in kind and flavour. There are two distinct kinds of fluid thus separated; the one becomes coagulated when it cools, the other

does not coagulate; and that which coagulates easiest and firmest, is proportionally deficient of nutritious qualities. Thus, the tendinous parts of animals, such as cow-heel, yield a great proportion of this strongly coagulating matter. It is mostly from this that the jellies in confectioners' shops are composed; and, although these are rendered palatable, by the addition of certain condiments of agreeable flavour, it is impossible to render them, in the slightest degree, nourishing; yet, strange enough, this is one of the substances most usually had recourse to when nutritious matter, easy of digestion, is required!

Dr. Willich, in his book on Diet, &c. follows this opinion, and is consequently altogether wrong. He remarks, in page 183, that "all substances which contain *much jelly*, whether animal, or vegetable, are nourishing; for this alone affords nutriment; and the hard, watery, and saline particles of food cannot be assimilated, or converted into chyle. Nourishing substances would, indeed, be more conformable to nature; but, as our appetite generally incites us to eat more than is necessary, we should acquire too much alimentary matter, and become *too full of blood*, if we were to choose only such articles of food as contain a great quantity of *jelly*." I, however, have no hesitation in asserting that the doctor's blood would be sufficiently scanty, at least not too superabundant, were he solely to confine himself to the use of such gelatinous matter for his food.

People, indeed, without attempting to reason on the subject, shew, by their actions, the absurdity

of such opinions. Thus, the poorer classes, whose circumstances compel them to live much on cow-heels, feel how little nutritious matter such food contains, and are naturally led, when they can afford it, to eat a piece of pork, or bacon, along with them. We also every day observe that, with veal, chickens, &c. pork, bacon, salted tongues, &c. are used; but we never see these salted substances used with mutton, beef, &c. These facts are worth a thousand arguments.

The other fluid, which contains all the nutritive qualities of the meat, flows from its surface on being cut, but does not coagulate on becoming cool; and this fluid is always most plentiful as the flesh verges to the period of maturity, at which time it contains the greatest proportion of nutritious matter.

In veal, lamb, chicken, &c., we find a considerable proportion of the coagulable fluid, and little of the fluid which does not coagulate. As, however, these, and all other animals, approach toward maturity, the coagulating matter becomes less, while this fluid is much greater in quantity.

We also find that all young animals kept in close confinement, in preparation for the table of the epicure, such as house-lamb, &c., abound with even more of the coagulable matter than similar animals of the same age, which are allowed such exercise and free air as they themselves incline to take. Of course, such confined animals, although greater rarities, and generally esteemed greater luxuries, are certainly even less nutritious than animals of similar age which have been brought up in the open field.

With regard to the fibrous part of the animal, it seems to contain little, or, indeed, none of the nutritious quality. It appears rather a sort of vehicle to contain and diffuse the nourishing principle of the flesh, to fit it (as shall now be explained in treating of soup) the better to undergo the process of digestion.

All soups, of a liquid nature, however much of the principle of nutrition they may contain, are far less easily digested than animal food in its solid form. In order, therefore, to render such soups nutritious, it is absolutely indispensible to combine them with some sort of solid matter, even although such solid matter, of itself, contains little, or no nourishment. By want of attention to this simple rule, soups often feel weighty and unpleasant in the stomach. Still we find it by no means an unfrequent practice for some gentlemen, after being *tipsy* over night, to repair to a coffee-house, and endeavour to restore their digestive powers with a basin of soup; and this, unless used in combination with something else, certainly injures, in a greater degree, that which had already been too much injured. Independently of every other consideration, there are insurmountable objections to tavern soup; for, I understand, they are mostly prepared from all sorts of animal food which had been previously presented to the numerous dining parties, and consequently had met with various degrees of cleanly, or rather filthy treatment. This consideration *alone* is sufficient to injure a strong stomach, and is consequently little calculated to repair a weak one.

There are other circumstances equally applicable to all sorts of animal food selected for culinary purposes. Every forced measure, in respect to exercise or confinement, more than the animal itself inclines to use, or every forced measure to fatten animals beyond the natural bent of their appetite, and every systematic disease of the animal, or its having died a natural death, are all to be most scrupulously guarded against.

The general habit of animals is, under certain circumstances, subjected to a state of over-action, or an action greater than that which is absolutely necessary for the purposes of animal life, and this is termed a vascular state of the whole, or of particular parts of the body of such animals. This state of action, in all red-blooded animals, with the exception of the hare, and some others, whose flesh is naturally of a high red colour, when it exists to such extent as to alter the state of the parts, from what is necessary for mere existence, is generally caused by the natural growth of animals under maturity—by bodily exertion—by too full living—by confinement beyond the will of the animal—by the action of certain diseases—by that action which is necessary to effect the regeneration of lost parts, or by that infamous practice among butchers of hunting their cattle before killing them, to make their flesh appear florid.

Vascularity, of course, consists in a certain degree of redness of the part, and this redness is not so much owing to the quantity of blood actually circulated through such parts, by large trunks of

vessels, as by the number of minute terminations of arteries within a given space.

During the existence of this state, an increase in the size of parts, to a certain extent, takes place, and this is the regular effect of vascularity, whether it be produced by one or more of the causes enumerated. Whenever, or wherever this rapid, or profuse action in the vascular system exists, such extent of action uniformly tends to render the flesh of such animals less digestible, and less nutritious, in proportion to the extent of its existence. Indeed, vascular parts principally consist of blood, and that fluid, in itself, is quite indigestible. Such a state of parts, therefore, is equally deficient in nutritious properties, as that paleness which attends the apparent want of vascularity from deficiency of nutritious food, from want of due exertion, or rather inactivity, or only such motion as is performed in the system, by the mere circulation of fluids, which renders the blood-vessels small, and, of course, the parts paler.

All animal and vegetable matter undergoes the process of digestion with greater difficulty, in proportion as it is removed from its natural state, such as salted provisions, and also in whatever condition it may be, in proportion to the difference of its structure, or the different states of solidity in its texture, such as we find in the husks of grain, of certain skins of fruit, and in the shells of animals. The husks of grain, indeed, and skins of fruit, such as those of unripe gooseberries, are particularly difficult of digestion, so that we often find them

voided from the body, without being materially altered in structure. Bones, also, are much more difficult of digestion than flesh, because they are, in part, guarded from the powers of the stomach by the earth which enters into their composition. Indeed, even substances of more equal solidity, such as the various soft parts of the body of animals, are differently acted on by the digestive powers, rather from the nature of their structure than their solidity. Thus, we find the brains of animals easiest digested of all animal food—the liver next—the muscle next, and the tendinous parts more difficult than either. The blood of animals is completely insoluble in the stomach, and is consequently in no degree nourishing.

The improper use of vegetables generally produces a disposition to form acidity in the stomach, while the improper use of animal food produces a disposition to form putrescency, and the improper use of fatty, or unctuous substances, a disposition to form rancidity. The digestive powers, however, accommodate themselves in a wonderful manner to such substances as may happen to be the food of the individual, but to the instances of the different digestibility of the substances, I have now enumerated, there are perhaps scarcely any one exception.

REMARKS

ON THE

DRAUGHT PORTER AND ALE

SO EXTENSIVELY USED

IN

LONDON AND ITS VICINITY.

THE London ale and porter, prepared for pot-houses, are very different in quality, and infinitely more deleterious in their effects, than the same description of liquors made for private families. Although malt, hops and water be employed, to form a very strong fermented liquor, still it is mild to the taste, while the pot-house ale and porter are harsher and stronger than could possibly be made by *any quantity* of malt, hops and water. This harshness, therefore, of the pot-house fermented liquor, must be caused by some other admixture than malt, hops and water. Some have been of opinion, but whether right or wrong I cannot say, that such harshness and stupifying effects, as uniformly result from the profuse use of these liquors, cannot possibly arise from the spirit imparted to them by the malt, but from the admixture of *coculus indicus*, *nux vomica*, and other deleterious substances. That some sort of improper substances are mixed with them, either by their manufacturers or venders, seem too true, for otherwise

their makers, or venders, could not furnish a pot of either of them made solely from malt, hops and water, at even double the money they are sold for. Besides, their effects on the constitution are altogether different from what is produced by home made porter or ale. None who have been accustomed to use the latter, but, on substituting for them the pot-house ale or porter, have almost immediately suffered a derangement of their digestive organs. Another circumstance respecting these pot-house liquors, we find that those, in the daily habit of using them freely, are involuntarily led to the use of other substances to counteract their bad effects on the stomach. It is a curious circumstance that such measures are generally adopted without the individuals employing any sort of reasoning on the subject, but only because they feel them of use. The most common of these habits are smoaking tobacco, and drinking gin. I have made strict enquiry, at various of the houses where great quantities of ale and porter are sold, and have ascertained, that scarcely any one, who indulges freely in the use of such draught liquors, but, at length, becomes a dram drinker, or learns to smoke tobacco. Another curious circumstance which I have ascertained, adopted by those who indulge freely in the use of these liquors, is, that those who are subjected to very hard labour, such as coalheavers, are not so apt to indulge in smoaking tobacco and drinking gin as those who remain in a state of inactivity during the time that the porter, or ale, exert their effects on the stomach.

It would thus appear that great exertion of body is somewhat equivalent to the action of the tobacco, or the gin, in obviating their bad effects on the stomach, and consequently it is evident that the free indulgence in their use is inconsistent with the healthy functions of that organ.

A

PRACTICAL ESSAY

ON

DIGESTION, &c.

IN WHICH ARE DEVELOPED THE PROGRESS AND CHANGES OF THE INGESTA, FROM THEIR ADMISSION INTO THE BODY TILL THEY ARE PARTLY CONVERTED INTO BLOOD, AND PARTLY THROWN OUT OF THE BODY.

THERE certainly is no process in the whole operations of the animal economy, of nearly so much importance to man as the means by which his existence is to be preserved, and his condition rendered comfortable. Thus, the process of digestion may be ranked as the most important function of animal life—its right performance being attended with the greatest possible human comfort, while its imperfect performance is often accompanied with every variety of the deepest misery. Every faculty of the mind, whether the individual be asleep or awake, is, from this cause, either raised to the greatest pitch of morbidly distressing excitability, or is depressed in a most unaccountable manner. Thus situated, the indolent and the active—the demure, and the gay—the peasant, and the prince, are indiscriminately affected, and all look on their once favorite pursuits and amusements, with the most perfectly unreserved indif-

ference, and even disgust; they now actually feel burdened with an existence which has become an unvaried scene of hopeless wretchedness. Any act positively requiring mental exertion, especially recollection, or memory, and even such as may simply require corporeal exertion, the very attempt to execute these tasks, sinks them, if possible, still deeper in misery; till, at length, temporary derangement of judgment, often bordering on complete idiocy, ensues.

Much has been conjectured, respecting the various changes to which the aliments are subject, from their admission into the stomach till they have been digested, and are partly evacuated from the body.

I shall, therefore, proceed to an examination of this important subject, and previously offer some observations, respecting hunger and thirst.

The sensation of hunger arises from a secretion, termed, the gastric fluid, the nature and properties of which, I shall soon have occasion to explain. This fluid, acting on the sentient extremities of the nerves of the stomach, causes the sensation of hunger; and this is more probable, than that the anticipation of any particularly pleasant feeling in the organ of taste, should be the cause of hunger. The terms of gluttony, and epicurism, may be applied here. Gluttony is mere hunger, or, a violent desire to fill the stomach, with little discrimination in the selection of food; while epicurism chiefly consists in a selection of articles most calculated to excite pleasing sensations in the palate.

Some insist that hunger is a painful sensation,

and some, that it is of a pleasurable nature—but what subject is it that cannot be viewed in more ways than one? I may only remark, that all our sensations may be greatly modified, if not even wholly altered, by external circumstances. Thus, hunger, when a piece of well roasted beef before us, is very pleasant; but, place us with a keen appetite, without the means of gratifying it, in a barren field, and then hunger is a very painful sensation.

Hunger may be very acute, and, even without eating, our desire for food will entirely cease. This probably arises from the gastric fluid being secreted, and, having no food to act on, it acts on the coats of the stomach itself, and, by exhausting their sensibility, destroys, for a time, the sensation of hunger. A similar phenomenon takes place in smelling odoriferous substances, for, when such substances are applied to the nose in considerable quantity, and for a length of time, they cease to affect our organ of smell.

During the existence of thirst, the cavity of the mouth, the œsophagus, and probably, even the stomach are affected. This sensation is immediately produced by a want of due secretion, in one, or more of these parts, or by a morbidly acrid discharge from them; or, it may alone be caused by the immediate action of food, taken either in too great quantity, or altered in its nature by seasoning of various kinds.

Mastication is the first process the food undergoes in the animal body. This process consists in bruising the food by the teeth or jaws, previous to

its being received into the stomach. Those, indeed, who do not sufficiently masticate their solid food, give the stomach a duty to perform beyond its powers, and this is often a cause of depraved digestion.

The tongue, or rather the small papillæ, which exist all over its upper surface, constitute the immediate organ of taste. Its muscular substance, in combination with the muscles attached to it, enable us to roll the tongue in various directions, and thus give motion to the food. In this process the food is mixed with a proper proportion of saliva, and then passes along the œsophagus into the left extremity of the stomach. The saliva, employed for this purpose, is secreted by two glands, termed, *parotid glands*, one of which is on each side, immediately under the inferior lobe of the ear. During mastication, the muscles, called *masseters*, press on these glands, which causes an influx of saliva into the mouth, by the parotid ducts. This saliva doubtless assists in dissolving the aliment, and thus renders it fit for digestion. The quantity of saliva, formed by these parotid glands, at each time of eating, is considerable. I recollect to have seen a case stated (but I forget where) of a soldier who had one of these ducts, leading from the gland, cut across by some accident. The wound healed, except at one spot, from which the saliva flowed when he moved his jaws, and, during the time he occupied in taking dinner, as much saliva escaped, through this small orifice, as wet two handkerchiefs.

Thus prepared for digestion, the food is propelled forward, or rather, in the human body, downward,

by a series of alternate muscular contractions and relaxations. It is forced into the œsophagus, by the contraction of the muscles of the mouth and fauces, and by the action of the tongue; and the œsophagus, of course, relaxes to receive it. The œsophagus, in its turn, exerting its muscular powers, forces the ingesta into the stomach.

From the whole inner surface of the stomach, but more especially from about its left or broadest end, there is a fluid secreted, termed the gastric fluid, and physiologists have agreed that without it, the process of digestion cannot be effected. One circumstance, much in favour of this opinion, is that, where the gastric fluid is most profusely secreted, which is about the left or broadest end of the stomach, there the most marked changes on the food are effected.

In a healthy stomach, this fluid is pellucid, and, in common with some other secretions, such as the tears, saliva, &c. is of a saltish or brackish taste. From the particular substances used in living, it is somewhat difficult to ascertain whether this fluid itself is of an acid nature, or if the acid, so frequently found in the stomach, is solely owing to the food, &c.

While this gastric fluid remains so necessary in the process of digestion, it is also capable of preventing both the fermentation, and putrefaction of the substances, on which it acts. Indeed the healthy powers of digestion constitute an action of a different, perhaps, of a greater force than that which causes either fermentation or putrefaction, of the substances in the stomach. The stronger

power, of course, prevails, and thereby prevents either fermentation or putrefaction of the ingesta. When fermentation or putrefaction takes place, in the stomach, (the first of which is the most frequent) they can only exist during disease. Thus the healthy digestive process prevents the possibility of the ingesta running into fermentation or putrefaction. Besides *fluidity*, which is essential, both to fermentation and all other chemical processes, is always unfavourable to the process of digestion. Indeed its antiputrescent power will not admit of a doubt, for substances which would soon have run into acescency, in the open air, are prevented doing so in the stomach. This acescency, therefore, cannot exist during health, but is altogether a consequence of disease.

In order that the agent or agents in digestion may act, on the substances taken into the stomach, it is absolutely necessary that such substances be completely deprived of the living principle; for, while alive, the digestive powers seem quite incapable of producing any material alteration in their structure. Thus worms can live in the stomach, and it is only the living principle of the stomach itself, which renders it capable of resisting the action of the gastric fluid; while also it is daily employed, in digesting dead animal matter, which, by its nature, and various methods of preserving and cooking it, is much more likely to resist digestion than the stomach itself. John Hunter has proved this fact beyond doubt. He found that the stomach itself is no sooner deprived of life than it is instantly subjected to the action of that very

fluid which it had previously secreted; for he observed that almost every one who died suddenly, when the gastric fluid might be supposed to act most forcibly, had one or more holes in the stomach, and part of its contents were poured through these into the abdomen.

Experiment makers, to prove individual facts, on the subject of digestion, are as numerous as the experiments themselves, yet few of these gentlemen have proved themselves conspicuously useful, except in proving, in the most conspicuous and unequivocal manner, that well disposed men may often toil without meaning, and calculate without any kind of benefit to their fellow mortals. Thus in every subject connected with every part of the animal economy, we have numerous experiments, equally conspicuous for the cold blooded and butcherly disposition, and for the want of judgment of those who make them. In common with other subjects we have plenty of useless experiments on digestion, or rather on the powers of the stomach in preparing the food for the purposes of nutrition. In these we find the operations of the stomach occasionally converted into a *grinding mill, a common digester, for making soup, a chemist's crucible, or a brewer's vat or fermenting tub;* and these truly ridiculous speculations often made with a very laughable degree of sagacity.

The grinding gentlemen, of whom, I believe, PITCAIRN was among the most conspicuous, having concluded that the stomach could be nothing else than a grinding mill, of a certain given power, computed how much weight the force of the

stomach was equal to. They conjectured its pressure equal to one hundred and seventeen thousand and eighty-eight pounds weight; and when the individual powers of the stomach were assisted by the additional pressure of the diaphragm, and abdominal muscles, the weight of pressure was about doubled!

At other times, and by other men, equally unacquainted with their subject, the operations of the stomach have been supposed to resemble *Papin's digester!*

When, also, the opinions of the chemical physicians prevailed, they were determined that almost every operation of the animal body should depend on fermentation, or on the influence of various chemical affinities. The process of digestion was not overlooked, because being resolved to twist every operation of the body to answer their particular purposes, they contrived to persuade themselves, and they wished also to persuade the world, that the body itself was nothing else than a *chemist's furnace!* and every particular organ of it was merely a *crucible!* It, therefore, was their principle on all occasions, to treat the diseases of the living body as they would have treated the materials in their furnaces! These notions, however correct when tried in mere chemical experiment, are very different when applied to bodies possessing vitality; because living bodies, placed under similar circumstances, are very differently influenced from mere inanimate matter. They thus seemed intentionally to overlook that such a thing as animal life was at all concerned in

the regulation of these proceedings. Had they, however, reflected, even on the single fact that ardent spirits, applied to various ulcerous affections, are often of advantage, while the internal use of such substances influences, irritates, and renders the affection worse, they would have discovered one of the sources of their mistake.

It would be well for the world, were such gentlemen to confine their professional conjectures, their experiments, and their practice, to nothing but bottles, crucibles, and mills!! It is not by such men that medical science is to be improved, or medical practice, human comfort, and relief, under the pressure of disease, is to be expected; or if they do happen to stumble on the right way, it is solely by accident, and they might, for what they know, be equally apt to stumble on the wrong.

I may only state that digestion can, in no way, resemble any chemical process, for digestion alters all kinds of vegetable and animal substances in their original structure, and a third sort of matter is formed resembling neither the one nor the other, before they are converted into nourishment for the body; and this change, in their natural properties, takes place, on these different substances, at the same time, which never occurs in any chemical process.

We have these proofs in medical practice, that men, of small understanding, attempting to reason on complex subjects, generally draw their conclusions from insulated facts, and superficial observation. They mistake the inclination for the ability,

and in substituting imagination for judgment, they are never at a loss to explain *any thing*, in their own particular way. Such gentlemen ought to know that nature often effects the most important purposes, by a seemingly small cause, and that she seldom requires such engines as theirs to accomplish her ends.

Other experiments have been made, of a much less objectionable nature. Not the least ingenious of these were instituted by John Hunter, to ascertain the effects of the digestive powers, and the method in which the various kinds of food, &c. were prepared for the nutrition of the animal machine. As, however, there are very few stomachs that we find in a perfectly healthy state of action, and as John Hunter's experiments, and the conclusions drawn from them, seem to have been indiscriminately made, without due consideration of this circumstance, we must not be astonished, if, in a practical point of view, both his experiments and others, on the same subject, have led to nothing of an immediately useful nature. Even the most rational of these experiments, performed by any two individuals, have not coincided, except in the most general facts, which has left us as ignorant of what they were instituted to explain, as before they were made. Owing, indeed, to the various conditions of the stomach, we know that one cause will produce an effect, in the animal economy, very widely different, at one time, and under certain circumstances, from what the same cause will produce at another time. Even the healthy conditions of the animal economy are in

perpetual change, and these variations are constantly caused by the varied and successive external and internal influences, which modify, and even sometimes alter every operation of the human body. It was, perhaps, owing to these gentlemen having overlooked these circumstances, rather than from any inaccuracy in conducting their experiments, and in drawing their conclusions, that their reports are so very various. Thus the peculiar action, or actions, by which digestion is effected, is still unexplained. This deficiency of knowledge, however, is less to be regretted, since we so fully understand the effects of digestion, and the modes by which that process may be regulated, with tolerable correctness, and also those by which it may be improved when disordered. Much labour has been bestowed, and much time destroyed, in medical practice, in searching for what would not reward us for our trouble, even if we should find it, while matters, which might be practically useful, have been suffered to remain in the very greatest error and confusion. Had we, therefore, given the same attention, and exerted as much ingenuity, in ascertaining what particular substances were easiest, or most difficult of digestion, as has been consumed in endeavouring to explain the manner in which that process is accomplished, it is probable we might now be better acquainted, with the practically useful part of digestion, than we are. Whatever, therefore, constitutes the nature of the digestive process, it is extremely probable that heat, moisture, and motion combined, are absolutely necessary to its completion—that it is wholly car-

ried on within the cavity of the stomach itself, and that every individual power, connected with the stomach, only acts as an agent in digestion; and while the stomach, by these peculiar powers, nourishes the body, the general body also must possess considerable vigour to enable that organ to exert those powers.

In a stomach of tolerable health, digestion is usually accomplished in three or four hours. The precise time, however, for this purpose, even independently of disease, cannot be exactly ascertained, as some stomachs digest quickly, and others slowly; while also there is a remarkable difference in the degrees of digestability, and in the various kinds of food, as well as in the methods of preparing it for use. As a general rule to which, I believe, there are no exceptions, we ought never to take a new supply of food till the preceding meal has been digested.

The effects of the digestive powers, on the various kinds of food, are somewhat different. Fresh, or rather raw, vegetable food, for instance, is first rendered flabby, in its texture, as if it had been boiled, and, only in this state, is it rendered fit to be acted on by the gastric fluid.

The yolk of an egg, milk, and some other secretions, are, on their admission into the stomach, first coagulated, and, in that form, they are acted on by the gastric fluid. Respecting this coagulating process, as necessary for digestion, it was supposed by John Hunter, and the numerous herd of authors, or rather compilers, who have echoed such of his opinions and observations, as they could

understand (for some of them are really not easily understood), that because the coagulation of certain substances, takes place in the stomach, as of eggs, milk, &c. previous to their being digested, those substances, of course, ought to be easiest digested, which were formed into a coagulum, before they are received into the stomach. It is truly amazing that a man of Mr. Hunter's observation, should have dwelt for one moment on such a subject. It appears to me that the coagulation of an egg, in a pan of boiling water, is a very different sort of coagulation from that which is produced in the stomach, as a preparatory step to digestion. Instead of this coagulation, from boiling an egg, rendering it more fit to undergo digestion, than when used raw, I have no hesitation in thinking that such a previous preparation rather tends to obstruct, for a time, the very process we meant to facilitate. For to whatever state, or consistence, we may have reduced animal matter, by the various arts of preserving or cooking, they must all invariably be reduced *by the powers of the stomach alone*, to a gelatinous, or coagulated state, and that before they can possibly be reduced to the substance called *chyme*. It is, indeed, neither industry or ingenuity, that are likely ever to alter this law.

With regard to the fibrous texture of animal food, the principal change to whichit is subjected, in the stomach, is to be rendered somewhat more of a gelatinous or liquid nature, that it may be divided and diffused, so as to present as extensive

a surface as possible, to the influence of the digestive powers.

While life is altogether a state of force, it is also, at best, a fickle fabric, perpetually inclining to dissolution. It, however, possesses certain inherent principles of action, which for a certain limited number of years, enable us to regulate the action of these inherent principles, and thus prevent it falling into decay. Thus the animal body must be constantly supplied with nourishment, the principal part of which consists of the various ingesta. We thus find animals possessed of particular appetites, by which they are led in search of particular kinds of food, to supply that part of the body which is in continual waste. The aliment, received into the stomach, is soon subjected to certain invariable changes. There are first added to it certain fluids, and thus a substance is formed, which medical writers have called *chyme*, and this part of the process of digestion they have termed *solution*. It is *only* within the cavity of the stomach that this change can take place, for we find that the common articles of diet, having the same degree of heat applied to them, which exists in the living body, and also the same quantity of fluids, necessary for digestion, removed from the stomach, and added to them, no such substance as *chyme* is formed; and it is according to the regular performance of this process, rather than the quantity or quality of the food, that the body is properly nourished.

Thus the food, formed into *chyme*, is a combination of the digestible part of the aliment, and of

the gastric fluid, formed under the immediate influence of vitality.

It is extremely probable that, during vigorous digestion, every substance, introduced into the stomach, which contains materials, from which *chyme* may be formed, has all such substance, contained in it, formed into that fluid, and that, in such a state of health, none of the undigested food passes into the intestines. I say in a state of health, for when either that organ itself, or the body in general, are morbidly deranged, it is astonishing what a length of time certain kinds of food will remain in the stomach, without undergoing any material change in its texture; and doubtless, at length, by the action of the stomach, it is thrust forward into the intestines, in a somewhat similar state.

The regular process of digestion being continued, however, it is both a curious and a beautiful fact that, while the stomach is thus acting, on the common ingesta, it is gradually imparting to these very ingesta, a part of its own vital principle, for we soon find these substances gradually and slowly approaching to a state of vitality, on every successive change they assume in the body.

Such parts of the food, &c. as are capable of being digested, undergo that process, and, having remained a certain time in the stomach, in order that they may be subjected to certain necessary alterations, the action of the stomach continuing, the whole passes onward, to the *pylorus*, or right end or outlet of the stomach, whence it is thrust forward to the *duodenum*, or upper part of the

small intestines. If, however, digestion have been improperly performed, the food does not proceed along the intestinal canal, but is pushed back by the muscular action of the *pylorus*, and a sensation is felt in the stomach which causes much uneasiness, often for hours after eating, and not unfrequently is relieved only by vomiting. When the food, however, has been properly digested it enters the intestines and the nutritious part of it is formed into another sort of matter, of fluid consistence, which now assumes the name of *chyle.*

The gastric fluid, in its successive formation of *chyme* and *chyle*, is probably thus altogether altered in its nature, and, by this change, it is fitted to be reabsorbed, and returned to the general circulating system. Thus the gastric fluid is perhaps the only animal secretion, the reabsorption of which is absolutely necessary to the healthy functions of the animal body.

It has been conjectured that the bitter principle of the bile assists in preventing acetous fermentation in the stomach, when certain kinds of aliment are so disposed, and this effect has been supposed to act in the same way that the addition of the bitter principle of the hop acts in preventing acetous fermentation in malt liquor, long after its own nature would have hurried it to that state. This opinion, however, is certainly very closely allied to those of the chemical physicians, in their attempts to make a sort of *brewing vat, or fermenting tub*, of the human stomach, for the inference is drawn from a process, wholly carried on in a common vessel, and the resulting facts or con-

sequences are applied to certain operations proceeding within the human body, and, of course, wholly regulated by the living principle.

I confess, however, I am not easily swayed in my opinions, respecting the laws of the animal economy, by any kind of inferences, or conclusions, which even the most ingenious man may draw from experiments wholly unconnected with animal life, while the result of these experiments are applied to the purposes of animal life. The bile may possibly act in this way, but I am not certain how far these conjectures have their origin in truth, and, of course, how extensively they may be credited. Indeed, there exist different opinions, whether or not the bile enters into the composition of, or produces any immediate effects on the *chyle*, or if it only exerts a certain influence on the intestines, in facilitating the passage of the digested matter. Whether, or not, it acts immediately on the *chyle* is less evident than the effects it produces on the intestines, as a natural purgative; for, by the increase or diminution in the quantity of bile poured into the intestines, their peristaltic motion is proportionally increased, or diminished. It is thus that bile, being prevented from passing into the intestines, is absorbed into the general system, and afterwards deposited in the cellular membrane, and so forms jaundice, and then we know that digestion is rendered imperfect, from a deficiency in the proper proportion of bile in the intestines. If, also, a very profuse quantity of bile enters the intestines, whether it be, or be not, mixed with the

ingesta, the most violent and painful purging, and sometimes vomiting, is the consequence.

That each individual portion of the intestinal viscera, and also its various secretions, are destined to produce some important change in the aliments as they pass along, will admit of no doubt, for nature is simple and consistent in every operation, and never holds any organ, or its produce, in unnecessary reserve, nor ever employs a larger organ than is necessary for each purpose. That the bilious, and pancreatic liquors produce some important effect, or exert some influence on the aliment, seems certain, for we find that their proper secretion is necessary to health, while their improper secretion is as certainly accompanied by disease. It is not very probable that the whole remaining length of the intestines is necessary for the completion of such effects as they produce, yet this is not impossible.

The *chyle* being completely formed, it is about this period that the singular separation of the feculent and nutritious part of the aliment takes place.

The *chyle* thus passing onward to form blood, is attracted by, or gets entangled with the villous, or inner coat of the intestines. This fluid speedily passes into the absorbents, or lacteal vessels, which are distributed over the inner surface of the intestinal canal, and these lacteal vessels constitute what is termed, the absorbent system. I may here remark, that all matter, while it continues to possess the living principle, is wholly nourished by

absorption. This is equally the case whatever may be the shape, or form, or intellectual acquirements of the living matter; for this law pervades all beings, from the feeblest and most delicate vegetable, whose life is naturally short, to the close grained oak, whose hardy form has stood the sweeping of a thousand storms. It is thus that the human body is nourished, for the œsophagus, by which we receive the principal part of our support, is merely an absorbent, and does not materially differ, except in magnitude, from those distributed over the inner surface of the intestines.

The *chyle* which may happen to escape the lacteals, or absorbent vessels, of one part of the intestines, does not thus pass unabsorbed, for it may be taken up by similar vessels in its passage onwards. The *chyle* having thus entered the absorbents, is soon collected into one tube, or canal, termed, the receptacle of the *chyle*, or the *thoracic duct*. This *thoracic duct* ascends through the *thorax*, along the *œsophagus*, and opens into the left *sub-clavian vein*. There are various valves in the *thoracic duct*, which prevent the regurgitation of the *chyle*, after it has passed them, and there is also a valve of the *semilunar* kind, at the terminating extremity of the duct, which, being flat, forms no obstruction to the passage of the blood along the *sub-clavian vein*, while it allows the *chyle* to filter from underneath it, and thus mix with the blood. This substance, brought thus far by the operations of the animal functions, although actually formed into blood, is not yet sufficiently qualified to circulate in the arteries. Before it is fit for

this purpose, we shall trace its progress a little farther. It is first circulated through the veins, and is carried by them to the right side of the heart, and then through the lungs. When the blood has thus circulated through the lungs, it has gained a great accession to its powers in supporting vitality; for it has then become arterial blood, capable of nourishing the growth, and of supplying the waste of the body itself. It is now, therefore, capable of preserving even the very existence of those various secreting organs, on the right action of which this vitality depends. Perhaps most part, if not all this vitality is imparted to the body by the blood, in its passage through the arterial system; for, in this course, while it has been circulating from the heart to the remotest part of the body, it repairs all decaying parts, and forms others, and it replaces parts that had been separated by accident—it also forms bone to support the body—muscles to move them—blood vessels, by which, even the blood itself is circulated—nerves, to give it sensibility—and glands, and ducts, for various other purposes. Every organ of the body possesses energy, in proportion to the quantity of arterial blood that is circulated in, and distributed throughout its substance; or, in other words, in proportion to the quantity of arterial blood carried into the minute ramifications of the arteries, that it may thus be disposed of to support the various organs of the body, immediately before it is converted into venous blood. These offices being performed, when the blood has gone its round, it returns to the heart, by the veins, perhaps almost wholly de-

prived of its vitalizing principle, to again receive what it had lost at each round of circulation; and which it can only receive where it was first rendered perfect, in the lungs.

Blood is perhaps the only fluid, in the animal body, which can suffer disease, to a great extent, and which, merely by the abstraction of a certain portion of it, that which remains will, almost immediately, return to its healthy state. The disease seems here to exist wholly *in the blood itself*, which often extends to *particular organs* of the body, and sometimes even to the whole *general system*, while, in diseased states, of the other secretions, *the secreting organs themselves seem most commonly affected*, and, as they enlarge their sphere of morbid action, sometimes impart a certain degree of disease to the *secreted fluid*, such as turbidity in the urine, from diseased kidnies—vitiated bile in diseased liver, &c. Although the above circumstance respecting the blood, has been wholly overlooked by John Hunter, in his treatise on the *vitality* of that fluid, it is probably not the least important he could have adduced, in attempting to establish his favourite doctrine. Indeed, Mr. Hunter's Treatise on the living principle of the Blood, is a laborious effort of the mind—at once displaying much philosophic discrimination, and a great deal of patient perseverance. After all, however, I cannot avoid venturing to differ in opinion with him, on the subject of the blood's vitality. Before giving my reasons for so doing, however, I cannot avoid remarking, that this truly great man certainly has said more, and done more, for the

improvement of the philosophical part of medical reasoning and practice, than all the medical men put together that ever lived—at least those who have condescended to instruct the world by public documents.

In respect to Mr. Hunter's opinions, respecting the vitality of the blood, one or two remarks are all I conceive it necessary for me to make. Mr. Hunter, of course, thinks that *the positively vital principle of this fluid* forms every membrane, muscle and vessel of the body, "in and of itself," as he expresses it, and, without the blood, these could not be formed. The blood, however, I conceive to be as capable of *immediately* forming urine, bile, gastric fluid, and, indeed, every other secretion of the body, as it is of *immediately* forming membraneous, or muscular substance. We all know, however, that neither of these secretions could possibly be formed without the intervention, and immediate action of the particular secreting organ. Thus, blood can only act indirectly in the formation of these secretions. Such, indeed, I conceive to be doubtless the case in the formation of every firmer animal substance; and, although Mr. Hunter did not find out the way in which this is performed, there certainly is, in common with every other action of the body, some peculiar mechanism by which each of these tasks are individually executed.

The blood seems to me a mere *secretion, and is wholly a passive substance, possessing no more vitality in itself than the other secretions, but only capable of forming parts which possess vitality when*

they are thus formed. This will appear the more conclusive when we reflect that, from the semen, the whole living body is formed, with all its various organs, and yet no one will maintain that the semen possesses the living principle! The semen is, indeed, like the blood, a mere secretion, and, like it also, can only produce its ultimate effects in the body, by the immediate intervention of other distinct organs.

To return to the subject of digestion, we shall find, that the growth and waste of our body are perpetually going on. The healthy action is an action of restoration, and, even, to a limited extent, generation of parts. In infancy and youth, the deposition much exceeds the absorption. In the adult, they bear a near proportion to each other. In old age, the absorption acquires vigour, and exceeds the quantity of matter deposited. Hence the shrinking of the body—the thinness of the cranium, and diminution of all the other bones. The vascularity diminishes, and thus many minute vessels, which formerly deposited nutritious matter, are either indurated, so as to be unfit to circulate blood, or are entirely obliterated, while the absorbents continue in their vigour—hence the stiffness and rigidity so inseparable from advanced life. The new matter is secreted from the ingesta, and, after it has undergone the processes mentioned, the other parts of the matter are carried downward along the intestinal canal. The grosser, and excrementitious part of the ingesta, seems now to act as a sort of foreign substance in the body, and, by the muscular power of the intestines, it is gradually

and slowly conveyed along that canal, to be thrown out of the body as useless.

Probably the greater part of the nutritive principle of the ingesta is absorbed in its passage along the intestines. This, however, is not always the case, for, in certain states of that canal, much of it passes from the body with the fæces. Indeed, it is extremely probable that, in no animal, is the nutritive part of the food wholly taken up by the absorbents, especially when certain kinds of food are used, or a greater quantity of *chyle* is formed than the lacteals are capable of absorbing at the time. As a proof that the whole of the nutritious part of the food is not absorbed, we must all have observed animals exist, and even become fat, while fed with the excrements of other animals. Those who feed fowls for the market, are aware of this, and, in order that the nutritive principle of their food may not pass out of their body, they make these animals undergo a fattening process, which they very appropriately term, *cramming*. This plan consists in their shutting up the anus, that all the nutritive principle may be absorbed in their intestines. It is after having subjected fowls to this monstrous process that many of our fatted poultry are brought to market.

To return to the passage of the fæces. The muscular motion necessary to thrust them forward, or downward, has been termed, *vermicular* or *peristaltic* motion. All kinds of matter thus passing along the intestines, of whatever consistence, whether solid, or fluid, proceeds regularly, and slowly, unless the intestines be excited into un-

naturally quick motion, by the operation of purgatives, or by certain states of disease. The various convolutions of the canal itself, as well as its varied diameter, and also the valves placed on its interior surface, are all calculated to detain the ingesta till the absorbents have had sufficient time to take up the greater proportion of their nutritious part. Nor does it appear, that the various positions into which the body can be placed, have the slightest effect either in accelerating, or retarding that motion; for, place it in any position, or, let the specific gravity of the ingesta be what they may, this peristaltic motion begins by regular contractions above, or toward the mouth of the *œsophagus*, and, the lower parts relaxing, in regular progression, the *fæces* are thus propelled forward, till they reach the rectum; when, by the additional action of the abdominal muscles, the evacuation is considerably accelerated.

There are perhaps few better methods of judging, whether, or not, the food has been properly digested, than by paying attention to the nature of the fæces. This is, at all times, imperfectly performed when the ingesta seem to have been but little altered in their passage through the intestines, or when evacuated from the body of a high smell, and dark brown, or black colour. We ought to ascertain, however, during the existence of such circumstances, whether they actually depend on disease, or may be wholly, or, for the most part, caused by particular kinds of food. We always find, for instance, that the fæces assume the state of putrefaction, in proportion as the food is more of an

animal, than of a vegetable nature; and hence principally arises that more offensive smell, which exists in the fæces of those animals who live mostly on animal food, than of those who live principally on vegetables. While these effects are produced on the fæces, we also find, that certain articles of diet, not only impart a certain odour to the fæces, but even give the general habit a particular smell. This is common in most gross feeding animals, whether human or otherwise; and, even in certain animals, such as those who live principally on fish, the flesh even tastes strongly of that particular food. The fæces from vegetable food, however, especially from dried vegetables, probably from less of its substance being absorbed than when animal food is used, are much firmer in their texture, while a proportion of animal and vegetable food affords fæces of a mixed nature. From these circumstances, a good lesson, in regard to the use of these substances, may be taken.

Whatever kinds of food are used, the more digestible such kinds are, or, in other words, the nearer its nutritious particles approach to the powers the stomach has in digesting them, and the lacteal vessels have in absorbing the nutritive part of them, whether animal or vegetable, the more nourishment that food can afford the body; and, under these circumstances, there is consequently a smaller proportion of fæces voided, than when the food is composed of hard, husky, dry, and consequently indigestible matter. Indeed, the fæces consist of that part of the ingesta, which, from their particular nature, as well as from the state

of the digestive powers, and absorbent system, cannot be absorbed, and, being thus wholly a foreign and useless substance, is speedily forced out of the body.

John Hunter has given instances of a dog fed with tallow, and a flea, whose sustenance is blood, having passed part of their food in their fæces quite undigested; and he supposes these to be proofs that certain parts of various kinds of food, although in their nature digestible, are not equally acted on by the gastric fluid. This, he thought, might be owing to two causes, *viz.* from part of the substance of such food being of such a firm texture as not to be digested at the same time with the other part of the food, and which consequently passed but very little, if at all altered in its texture, or that the stomach must have been so disordered as to digest imperfectly. Mr. Hunter, in the first of these suppositions, *viz.* that various kinds of food are variously capable of undergoing the process of digestion, I say, in this, he certainly formed his opinion on sound principles; but he does not seem to have recollected that, (as in the instance of the dog and flea he mentions) he had overloaded, most probably, their digestive, and, most certainly, their assimilating, or absorbing organs, and consequently rendered them incapable of acting in a healthy manner. The food of these animals must, therefore, have passed forward, and out of the body, without being altered in its structure. Mr. Hunter, in these instances, rather neglected to employ his usual great accuracy; for, it is an axiom in physiology, that *no vessel can contain more than it can hold, and no organ exert an action beyond its*

power; but, on such rude and unphilosophic assaults being made on them, they are more likely to assume a morbid state of action, by having their natural powers clogged and overloaded, by an over proportion of such matter as, (had it been more judiciously administered) might have nourished and supported them. Indeed, it is wholly owing to this circumstance, that less, or more of the nutritive part of the aliment is, in almost every instance, evacuated with the fæces.

It is amazing that such a man, so well acquainted with the laws of the animal economy, should have drawn such a clumsy conclusion from its operations. Still, however, (and this is one proof of it) the most ingenious and industrious man that ever lived, cannot force the laws of animal life to accommodate themselves to his experiments, or his reasoning, unless he first reduces these laws to a state of disease, and then no regular result, following such experiments, can be depended on; as a diseased surface causes diseased action, which is always, more or less, at variance with the regular rules of the animal economy.

In these instances, adduced by Mr. Hunter, in proof of his supposition, the disease, probably both in the stomach, and intestines, of both the animals he has adduced, which might prevent the alteration in the structure of the tallow, and the blood, did not exist till he employed the superabundant proportion of these substances, which, of course, caused it.

Whether the powers of digestion be stronger in early life than they are in full grown persons, may

admit of some doubt. We know that growing persons require more food than the full grown, and, therefore, must digest faster; but this may probably arise from the various vitiated habits men acquire in after-life. It is certain that all the organs of the human body, in early life, are generally in the greatest state of perfection, for then no indulgence in acquired and vitiated habits have injured them. It is perhaps owing to this, more than to any other circumstance, that we find such unaccountable lightness and elasticity in the mind of the young, and that uniform depression, where bad digestion prevails, or, in advanced life, when digestion, in common with all our other faculties, begins to fall off.

I previously stated, that the materials of which our body is composed, have a continual tendency to decay, but that which we term vitality, (which, like the galvanic and magnetic powers, can only be demonstrated by its effects) tends to prevent all such new combinations as may lead to its destruction. It is, therefore, by the operation of these vital powers, that the attraction of substances is governed within its sphere of action, and it is consequently thus, that all the processes in the human body are wholly regulated. This wonderful effect of vitality will appear the most surprising, when we reflect, that the body is constantly exposed to the chief agents of putrefaction, *viz.* heat, moisture, and air.

While these proceedings are going on, with a truly miraculous degree of regularity, we find other processes in perpetual action, for the purpose of

throwing out of the body all that which has become useless, or may be unfit to perform its healthy functions. For not a particle of matter is suffered to remain permanently in the system, unless it possesses certain powers of action suited to the regular laws of animal life. It is wholly owing to the conflict which is excited between the vital powers, and any such foreign matter, within the body, that constitutes those morbid actions which are presented to us in the various forms of disease. For the diseases of the human body consist of nothing else than the introduction of some foreign substance into it, of a substantial form, or from decayed, or decaying parts of the body itself, or from the effects of some effluvia of a peculiar nature. It is thus we find the system morbidly affected, in every degree, from the slightest indisposition, perhaps from some improper substance taken into the stomach, till it is suddenly overpowered and entirely destroyed. This subject, thus considered, opens to us a wide field for observation and reflection, in regard to every circumstance by which human existence is to be continued.

View this fabric in whatever way we may, it certainly is a most wonderful system of action and re-action; or, in other words, a system of action, and a power of resistance, so that a proper equilibrium may be preserved. In order, therefore, to constitute perfect health, it is necessary that these powers of action and re-action, should so correspond in their operations, that neither the one nor the other shall permanently predominate; for, in proportion as this standard of action is deviated

from, while the importance of the affected organ, in the animal economy, is considered, the extent and importance of disease is established.

The most surprising operations of the animal economy, however, are the numerous actions, with the very great diversity of their nature; and, of course, the numerous necessary resistances by which these actions are preserved in their proper order, which are at once proceeding within the small compass of our little body. We find each particular organ formed in a peculiar manner, adapted to its own particular use or uses, and supplied with nourishment to enable it to execute its particular functions, in its formation of new and necessary combinations. It is thus that a balance is kept up in the system, which is at once necessary to preserve health, and prolong existence.

Life, indeed, is one action, which is the mere production of a variety of smaller actions; and, although most of them are very different in their nature, and all of them, individually considered, totally different in their results, yet their varied structure, and these various uses, are absolutely necessary to the continuance of that state we term vitality, or life.

This vitality, or principle of animal existence, is of the same nature in every living animal, but its modifications are innumerably diversified. These variations may exist from two causes—first, from some particular organization of the whole, or of some particular parts of certain individuals, and if any alteration is observable in such, it is slight and generally of short duration. It is thus we find the

naturally volatile sometimes greatly depressed, while even the most gloomy are tempted to smile. Both these, however, soon start to their own level, whenever the temporary causes, which influenced them, have been withdrawn. The second causes, of such varieties, are much more numerous—altogether external to themselves, and, therefore, may be removed from the individual, or the individual may be removed from them. These generaliy consist of exposure to certain kinds of atmosphere. Thus a foggy damp atmosphere, such as that of Holland, &c. renders the natives dull and phlegmatic, while such persons, moved to a serene atmosphere, become firm in structure and active in mind, in proportion to the elevation of such places. Particular modes of living, too, have a wonderful effect on the body and mind. The long use of vegetable food renders the body weak and the mind indolent, while animal food gives energy to the body, and, by a profuse use of it, in every sort of animal, they partake of various degrees of ferocity and savageness. Wine and spirits produce both these effects, especially when taken to excess—they first elevate and inflame the passions, while their ultimate effects seem to exhaust and depress the animal powers—*they give action, but depress power.*

The various occupations, physical and moral, also, have a wonderful effect on the regulation of bodily strength, and also, on the indolence or activity of the mind. These are greatly modified, on such habits being pursued within doors, or in the open air.

Thus by the proper, or the improper application of the above circumstance, we may modify the vital principle in a wonderful manner—indeed it is owing to these circumstances that the human character is presented to us in the various ways in which we find it in society, and in the innumerable forms in which it is found in the different regions of the earth.

Each of these organs, of the animal body, from the centre of circulation itself, to the most remote part, and minute point of the body, can suffer no material interruption, in their actions, from the first moment of existence till death breaks that chain which held them together.

From these functions, however, being so perpetually exposed to the chances of derangement, by eating or drinking improper substances, or even breathing impure air, nature has rendered such a power capable of performing sufficiently healthy action, to support the body, even under a considerable state of derangement. Indeed were this not the case—did the digestive process cease, like the operations of many organs of the body, when only slightly diseased, human life would, of necessity, be of much shorter duration than it is.

It is this uninterrupted, or rather uninterruptible action, which forms a very distinguished difference between the living body, and all inanimate matter. By certain powers, inherent in the living body, it can repair certain injuries, it may have sustained, in a wonderful and beautiful manner, while inanimate matter, however skilfuly organized, is wholly incapable of any such power. It is thus that cer-

tain extensive injuries, done to the living body, are repaired, provided the vital powers of the animal have not been wholly destroyed. This restorative power, I may remark, seems to depend more on the digestive and sanguificative organs, than on the brain—a wound in a paralytic limb heals.

Animal life, also, is regulated by different laws from those which regulate all other matter. We find that the living powers cannot be continued without fatigue, and, from this state of exhaustion, rest and sleep recover them; but every other kind of matter may be kept in action for ever, without any necessity for rest. Thus, in animal life, we cannot, as in other machinery, stop the whole structure—repair the decayed portions, and again cause it to resume its operations, but as our great dramatic poet observes, "when stopt it needs must wither—we know not where is that Promethean heat that can give it vital growth again."

These vital powers, also, differ from chemical agents, as the living matter always obeys the laws of gravitation, while the galvanic and electric fluids are not influenced by that power.

All living beings have a certain round of action to perform, and although, to a certain degree, in perpetual change, may undergo these changes without the necessity of having the regularity of their actions interrupted by disease. We enter upon life with every organ of the body in perfect health—we advance to maturity, and at length the chilling frosts of age assail us—our vitality is exhausted, and we soon gravitate toward the centre of that earth, of which, in a short period,

we are to form a part. This decree seems invariably fixed, and the vain profligate, and he who economizes existence—he who slumbers in indolence and sloth, and he whose active ingenuity has placed his name high in the annals of fame—he who lingers in want and obscurity, and he who lives in superfluous splendour, equally press forward to mortal dissolution. These laws apply to all bodies, for we find that however much their physical density, or the principles of vitality may preserve them for a time, " to this must they come at last." The close grained granite that seems calculated permanently to resist the effects of time, crumbles into dust, and the sturdy oak, that for ages, frowned in surly murmurs at the storm, at last bends toward the earth's centre with an equal degree of feebleness, as the most minute twig of the feeblest osier.

" What does not fade ?—the tower that long had stood
The crush of thunder, and the warring winds,
Shook by the slow, but sure destroyer Time,
Now hangs in doubtful ruin o'er its base.
The flinty pyramids, and walls of brass,
Descend : the Babylonian spires are sunk ;
Achaia, Rome, and Egypt, moulder down.
Time shakes the stable tyranny of thrones,
And tottering empires crush by their own weight ;
This huge rotundity we tread grows old,
And all the worlds that roll around the sun."

OF DROPSY

SUCCEEDING

AFFECTIONS OF THE LIVER.

This is one of the most general consequences attending a long protracted morbid state of the liver. It, however, may arise either immediately from a diseased obstruction to the circulation of blood through the liver, in consequence of that organ being in a consolidated, scirrhous state, or it may be merely a consequence of the general relaxation of the body, so frequently an attendant on long protracted liver complaints. Doubtless, in some instances, both these causes may exist at once.

I shall here make a few remarks on the generally prevailing opinions concerning that morbid accumulation of fluid which we term dropsy.

Accelerated action, and an increased effusion of that fluid which constitutes dropsy, have often been mistaken by even the most celebrated medical authors, as proceeding from a somewhat similar cause; and from this *very great mistake* has arisen much perplexity, and often a total impossibility to explain some of the phenomena of this disease.

Instead, however, of these states (accelerated action and increased effusion) arising from a similar condition of the vessels, they have their origin and immediate existence under totally different circumstances from each other. Accelerated action is an increase of the animal powers, and can only be caused by the application of stimuli, either to the individual part, or to the general system, while accelerated effusion, (except, indeed, in a few instances of pressure causing some immediate impediment to the venous circulation) instead of its requiring *accelerated* action, is wholly a consequence of *diminished* action. We may even adduce dropsy to prove what I have now asserted, and this disease has again and again been brought forward, at various times, by others who have entertained different opinions on this subject.

In dropsy we know that there exists much general debility, and to give an increase and consequently more forcible action, to certain vessels of the body, in such a state of reduced vigour, than what even the same parts possessed in health, is altogether inconsistent with rational reasoning, and directly in opposition to that uniform regularity and beauty, which pervades every organ of the animal economy. Under such states of debility, as exist in dropsy, there is no earthly necessity for having recourse to a supposed accelerated action, to explain the phenomena of that disease, especially that form of it which exists under a long protracted liver complaint, where the general habit is *always* in the most depraved state of action; for the same want of power, and consequent want of action, which renders the absorbents unable to

take up the morbidly effused lymph, also renders the exhalents lax, and consequently unable to *retain* the naturally secreted fluid in a healthy way. In gleet, and in leucorrhæa and various other diseases, where we know such discharges are consequences of relaxation,* who would, for a moment, imagine that such increase of secretion was in consequence of increased action? No one: and the same argument applicable to these diseases is applicable, also, to dropsy. I need say no more in proof of what must seem to every one so very evident—that increased action, in no set or class of vessels, produces dropsy, but the directly opposite state, *viz.* that of debility, both in the exhalents and in the absorbents; and it actually requires both an increase of force and of action, to the general system, and consequently, to *all* these vessels, before we can *permanently* restore these parts to their healthy condition, and this in *all* cases must be done before we can calculate on having effected a permanent removal of the disease.

In treating of pressure applied to certain parts, to such extent as to obstruct the venous circulation, and thereby produce dropsy, Dr. Wm. Saunders, in his work on the liver, in common with many others, labours under great perplexity, in endeavouring to account for what he supposes to be the increased action of the exhalents, and the diminished action of the absorbents, in the production of that disease. He is decidedly of opinion that dropsy can exist only from a *diminution* in the force and action of the absorbents, while the same excess of effusion must also have for its existence, an *excess* of vascular force and action! With re-

* See my work on "The Generative System," &c.

gard also to the immediate action of the vessels causing an unnaturally great secretion of bile, Dr. Wm. Saunders applies a somewhat similar theory to account for it. He observes that "to produce an increased secretion of bile, it is plain that there must be an increased action of the branches of the vena portarum, and an acceleration of fluids through those branches: hence a condition of the vessels is induced, *approaching, in some respects, to that of inflammation*, with this difference, that it is an inflammation in which the vein, or secreting vessel, is more concerned than the artery or nutrient vessel." In this instance, however, I should again venture to differ in opinion from that very judicious physician; for I do not think that almost any instance of increased secretion of bile, requires either any thing like inflammation, or an acceleration in the actions of the vena portarum, for that purpose. It would be equally consistent to urge that a morbid increase of other secretions existed in consequence of an acceleration or inflammatory state of their neighbouring vessels. We know, for instance, that increased perspiration is most frequent when the whole system is reduced to the greatest state of debility, and that morbid increase of secretion, in the male, causing gleet and seminal emission, and, in the female, leucorrhœa, owe their existence, at least their continuance, to a similar state of debility. It is exactly similar to the morbidly increased secretion of bile—the vessels immediately secreting that fluid become diseased, and, in common with every other secreting organ, especially in the first stages of their disease, the secretion is rather augmented than diminished. This opinion of Dr.

Saunders is somewhat similar to that respecting edema and dropsy, which I think I have previously shewn to be quite erroneous. These states he also thinks may exist either generally throughout the system, or be confined to one particular part. The whole of his opinions, on this subject, are built on the well known fact that pressure applied to impede venous circulation, while arterial action is still going on, causes that effusion termed dropsy. To prove his position, that venous obstruction causes edema, he gives an example, while a plain statement of the fact was sufficient for any reasonable being.

Every one must have observed the edema caused by a tight garter, or any similar cause of obstructed venous circulation, but, although this is a plain and demonstrable fact, it does not follow that it is only under such circumstances that dropsy exists, for, indeed, I conceive that this alone, although certainly calculated to produce edema, is very seldom, if ever, the sole cause of dropsy. General dropsy, at least that which exists from a morbid state of the liver, thus seems to require not only sufficient pressure to impede the venous circulation, but also that depraved constitutional derangement which always accompanies such affections. Dr. Saunders, however, does not only urge that general dropsy is caused by this obstructed venous circulation, but he will have it that causes may be applied to produce this edema, and that such edema may exist without its being at all necessary to suppose any existing disease either in the exhalents or absorbents! I should like to know how it is possible that such an action, and

such an effect, so contrary to the laws of health, could exist without the presence of disease? It seems to me impossible. Edema, in this, and, indeed, in *every* instance, although Dr. Saunders might reckon it no disease, was certainly caused by a morbid secretion, and no morbid secretion will proceed from a healthy surface.

To constitute the most perfect state of healthy action, in every organ of the body, such parts must not have even the smallest particle of foreign or inactive matter applied to them. Because it is alone the presence of the various quantities, and various qualities, of such foreign, and consequently injurious substances, that constitutes every disease, to which human nature is liable, both in regard to its nature and severity, and this state may exist, either from the presence of some distinct foreign substance, irritating the parts, or simply from a morbidly enlarged condition of any natural organ of the body. The clearest proof, indeed, that no enlargement of parts can take place, without producing disease, is more especially demonstrable where such enlargement occurs in parts that are nearly connected with the prolongation of animal life, as there their presence is more conspicuously demonstrable by their effects. Certain deranged states, of some other less important parts of the body, may often exist and even give so little trouble that the general observer may deem it no disease, while, in other parts, the same sort of causes may produce instant death.

John Hunter has entertained a somewhat similar notion to that entertained by Dr. Saunders, where he observes, "that there is a circumstance attend-

ing accidental injury which does not belong to disease, *viz.* that the injury done, has, in all cases, a tendency to produce both the disposition and the means of cure." In these instances of John Hunter's, as well as in the edema of Dr. Saunders, these gentlemen seem to forget that, whatever medicines are employed to remove diseased action, they do not operate specifically on that condition of parts which exists in the form of disease, but only produce their beneficial influence through the medium of those accelerated or diminished operations which they produced in the animal body, which are *thus* influenced so as to be enabled to throw off their foreign or diseased action, which, without such aid, they were unable to do.

There are many diseases incident to human nature, where both the disposition and the means are inherent in the body, so as to remove them without the aid of medicine. Yet although the system generally exerts itself, to throw off diseased action, this does not constitute such diseased action no disease at all! Besides we often find that the very slightest external accidents, (which perhaps both Mr. Hunter and Dr. Saunders would term no disease) when they occur in scrofulous or cancerous habits, are often the commencement of a train of the most serious afflictions, which, however, but for the slight external accident, might never have made their appearance. Attempts, to maintain that such external accidents are no states of disease, are not more rational than to separate a fractured state of the scull from those dreadful consequences to which such accidents so often give origin.

On this subject, as on every other of which he

treats, John Hunter displays wonderful ingenuity. Having, as he thinks, established the former fact he attempts to make a distinction between that derangement, in the animal economy, caused by *accident*, and that caused by *disease*. He seems anxious to make out the former *a healthy derangement of parts!* (a state of parts which I confess I do not comprehend), while the latter is *an unhealthy derangement of structure!* (a state of parts which any one may easily comprehend). It seems, however, to me that such divisions of the morbid structure of parts, are more calculated to perplex than to elucidate. Health certainly is, generally considered, *one* state of action, every deviation from it is disease; and whether the powers of the system itself may be capable of restoring the healthy functions, or should there be necessary the influence of medicines possessing at least *peculiar*, if not *stronger* powers than the system can produce—powers, indeed, always unfriendly to that action which constitutes disease, still the same argument holds good, that disease existed, in the first instance, and this might have arisen either from the slightest accident, inflicted on the body, or from those mortal derangements which might, in a moment, deprive us of existence. These sort of useless divisions, therefore, were never calculated to facilitate science, or simplify those various changes to which the human body is liable.

We shall thus find how practically necessary it is to pay strict attention to those symptoms which indicate each form of this disease, and be guided in our proceedings by their peculiar nature—most generally by their severity.

EFFECTS

OF

MERCURY

IN LIVER COMPLAINTS.

MEDICINES, or other practical means, which, either *immediately*, or *ultimately*, produce debility, ought never to be used in diseases which always, of themselves, have a tendency to debilitate, or exhaust the animal functions, but by the most careful management, or in the greatest emergencies. This ought to be laid down as a fundamental rule, in the treatment of every disease, especially in such as affect those organs, with whose healthy functions the prolongation of human existence is closely connected.

To take a more particular view of this subject, however, in our application of any practical means, we ought to consider the following points, *viz.* the strength and vigour of the individual during such disease—the degree of exhaustion he is likely to sustain by the disease remaining unchecked, and whether its virulence will exhaust itself before it exhausts his strength, or, if it be of a nature not likely to be exhausted, but to continue unabated till it destroys his existence. When we have considered these points, we ought then to reflect what extent, or certain peculiarity of action, the means we would employ are likely to produce—whether debility, or not; and if their employment, even at the expense of a certain degree of exhaustion, will

arrest that diseased action, which, without their use, must have exhausted existence.

In short, without particularly weighing at least every one of these circumstances in our mind, before prescribing for any disease, especially if the medicines we use are of an active nature, we are more likely to do harm than good. The indiscriminate employment of any medicine is the surest proof of our ignorance, both of the properties of the medicine itself, and of the particular nature of that action which constitutes such diseases as we may attempt to remove by such means. It is thus that the use of mercury, in all morbid affections of the liver, and in all stages of such affections, has occasionally been deemed infallible in their removal, while, in other instances, it has been condemned as, not only useless, but often extremely hurtful. Perhaps both these reports had truth for their foundation; but mercury having been indiscriminately employed in the active, and in the chronic diseases of that organ, and also under every variety of constitutional derangement, gave origin to these different reports. Indeed, it is an almost uniform rule, that the introduction of any active medicine into practice, is, in too many instances, the introduction to its abuse; and thus we often find, that our best medicines are frequently condemned without just cause, and laid aside merely because those who thus employed them would not take the trouble to know how, and under what circumstances, they ought to have been rejected, or used. With regard to the employment of mercury in liver complaints, had all those who prescribed it exerted even a very moderate share of discrimination—had they ascer-

tained, if violent active inflammation existed in that organ at the moment they were charging the system with mercury, or, if the whole course of the disease had been of a chronic nature, or, if it had fallen into the chronic state as a sequel of previous active inflammation, then inconsistency would have disappeared, and their reports, consequently, would have led to one simple and uniform conclusion, respecting the precise circumstances under which mercury was, or was not to be employed with advantage.

In those cases, for instance, of deranged structure of the substance of the liver itself, which follow an inflammation of that organ, and are attended with a diminution of biliary secretion, it has been supposed, that a course of mercury, carried to the extent of producing salivation, has been attended with benefit. The previous inflammation, in such cases, might have acted in two ways—it might have left the liver considerably debilitated, or it might have produced a certain degree of condensation in certain parts, or in the whole of its substance, and less or more an obliteration of the biliary ducts. In the first of these, the state of debility, I am at a loss to know, how mercury could act so as to produce beneficial effects. If, however, it has decidedly done so, there is an end to all objections, as one fact is worth a thousand arguments ; but, generally employed, mercury is little calculated to restore lost tone, either of the general system, or any particular part of it. In the other state, subsequent to inflammatory action, where condensation of the substance of the liver, and possibly even obliteration of some of the biliary ducts has taken place, I

am still more at a loss than in the former instance of debility; for, till I am convinced, (which I suspect there will be some difficulty in doing) that mercury, in such states, has actually the power of regenerating lost parts, (which it must possess before it could make an obliterated, or, in other words, a destroyed duct, perform its natural functions) I cannot believe that mercury can do any such thing. In so far, however, as mercury may act on the remaining healthy, or only slightly deranged functions of the liver, enabling it to throw off the diseased parts, to be taken up by the absorbents, or by its peculiarity of operation in wholly destroying the diseased action, and, by either of these changes, permitting a regeneration of substance by the natural powers of the system, it may most certainly be of singular benefit. Such a reformation in the functions of the liver, would then not be a mere loose conjecture, or an attempt to reconcile impossibilities with sound reasoning, (too much of which exists in the practice of physic) but equally true, and equally demonstrable, as that regeneration of substance which takes place in a wound, or an ulcer, when either such foreign substance, or diseased action, as may have retarded such an act, has been removed.

Were we to conduct our practical enquiries with philosophic correctness, and each of them with a degree of energy proportioned to its importance, were we to estimate the value of every species of medical knowledge, only by its practical usefulness, the results of our labours would be much oftener satisfactory to ourselves, and much more useful to the public, than they are at present, when free,

open, and independent enquiry is almost wholly banished from the profession. This is but a dark view of a subject, on which not only the life of every one of us, but also our comforts so decidedly depend. I do not hesitate to assert that, before we bring the practice of medicine to that usefulness, of which it is capable, we must follow something like the above plan—we must have demonstrative effects from our practical exertions—indeed we must be of opinion that every attempt at reasoning, without these, however ingenious or beautiful it may be, is only a more than commonly artful method of supporting a feeble structure, and of gilding over the more dangerous features of ignorance and error.

Whatever may be the extent of effect which mercury possesses in these cases of diminished biliary secretion, it is extremely probable that, the indiscriminate manner in which it is too often applied, is fully as injurious, to the general health, especially among people generally weak, as its effects are beneficial.

From what I have observed myself, however, and from the experience of the most discerning and industrious of medical men, it appears that it is neither in a completely confirmed chronic state of the liver, nor while that organ is very actively inflamed, that we are to expect permanent relief from the exhibition of mercury, either taken internally or applied externally. In the active state it very frequently increases the symptoms—in the chronic state it yields at most only temporary relief. Mercury, therefore, seems principally useful only in such cases as had been recently caused by previous active inflammation, which had just

been subdued by venesection, purgative medicines, and strict attention to the antiphlogistic regimen; and even in cases of considerable continuance, provided the action existing in such cases is somewhat similar to the above. The necessity for strict attention to these rules, however, is less necessary in warm than in the colder latitudes. On the Coromandel coast, in the East-Indies, for instance, it may be administered even while a considerable degree of inflammatory fever exists, while such patients, instead of being debilitated by its effects, are greatly improved in their strength during its use. As a general rule respecting the use of mercury we must recollect, that it is by far too powerful a medicine to remain inactive in the system, and, therefore, its administration must either do good or harm—it must either remove disease or emaciate the body.

It is more likely to be useful where the disease is wholly of a local nature, or where such local affections have not imparted their morbid influence to the general system, in the form of fever; or it may be equally beneficial, in its influence, even although fever may have existed, provided it has been checked before our administration of the mercury. Since this substance, therefore, seems principally of permanent advantage, immediately after violent action had been subdued, and before the supervention of the completely chronic, or rather condensed state, in most instances we shall find it equally beneficial, immediately on the first symptoms of active inflammation making their appearance, and before they have increased to such a pitch of severity as to affect the general system, or

render it probable that the symptoms will proceed to suppuration. In such cases we shall frequently arrest the growing violence of the symptoms, and thus prevent the inflammation proceeding to suppuration. Thus, to be successful in the administration of mercury, or even to avoid doing much injury by it, we must not only ascertain that the liver is diseased, but we must know the particular nature of that diseased action. We cannot, for instance, with any degree of reason, expect relief from the most careful application of that medicine, where a great part of the liver has been destroyed by suppuration, or where strong morbid adhesions exist in certain parts of its substance, or between that organ and the neighbouring parts.

When, however, after having given due attention to the preceding circumstances, we have decided, that the administration of mercury is likely to be attended with advantage, we shall find it necessary, even then, to use much discrimination in respect to the moderation, or violence of the effects necessary to be produced by that medicine. I know of no general rule that can be so safely, and so advantageously employed in the extent of our administration of that active and often invaluable substance, as that of watching, whether or not the hepatic symptoms decrease under the effects of the quantity we employ, and the form in which we employ it. Thus, in the various cases that occur in practice, we shall occasionally find it necessary and proper to use the mercury in very great moderation, so as to affect the system in the very mildest degree, while, in other instances, especially in those of hot climates, we shall find it absolutely neces-

sary to be more liberal in our exhibition of that medicine; even, indeed, to such extent as will produce salivation as rapidly as possible, for then, and not till then, the symptoms begin to relax.

In these various degrees of exhibiting mercury, our whole object is, in a greater or less degree, to affect the general system by it; for, owing to the peculiar influence of mercury on the liver, we may *then* be assured, that that organ is under the fullest influence of that medicine. For this purpose it has been applied externally, by friction, in the form of ointment, over the region of the liver, or internally, in the form of pill or solution.

Each of these modes of exhibition have had their admirers, but when we have ascertained the quantity we can use with advantage it seems to me a matter of no very great importance, so far as the removal of the hepatic symptoms are concerned, whether the system be sufficiently charged by its external, or by its internal use. To affect our purpose with the greatest possible rapidity is of much advantage, and thus we may employ the mercury, internally, provided the bowels can bear it. When, however, from the violence of its effects on the bowels, we must employ it externally, friction is necessary for that purpose, because the absorbents of the skin are not active enough to take up a sufficient proportion of mercury by simply laying it over its surface. Internally employed, however, no such friction is necessary; nor, indeed, could we possibly apply it, for we find the internal absorbents possessed of sufficient activity to convey, by their own efforts, the mercury into the general circulation; and thus, by affecting the

morbid state of the liver, restore that organ to health. These different modes of applying mercury, present to us a beautiful example of the very great difference between susceptibility of action and sensation, and how very differently the seat of sensation (the skin) is affected to that of the internal surface of the stomach, &c. which possesses much more susceptibility, and much less sensation.

It should be laid down, as a general rule, that this early and active treatment ought never to be omitted *in any one case,* for suppuration is always so formidable in its consequences, that, if the early application of mercury prove ineffectual, or even injurious, (which is by no means likely), such injury can bear no proportion to the certain inconveniencies, and probable dangers which always attend suppuration of the liver. It is very seldom that such activity of practice fails of beneficial effects.

During our exhibition of mercury, we may at the same time, if necessary, employ the tepid bath with perfect safety, and often with great advantage.

The mode in which mercury acts, in its removal of the diseases of certain organs of the body, is not yet accounted for satisfactorily; but it is comfortable, during our ignorance of this, to know, that, in such cases, its good effects are to be ascribed to a peculiarity of action which uniformly follows its admission into the animal body.

THE END.

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