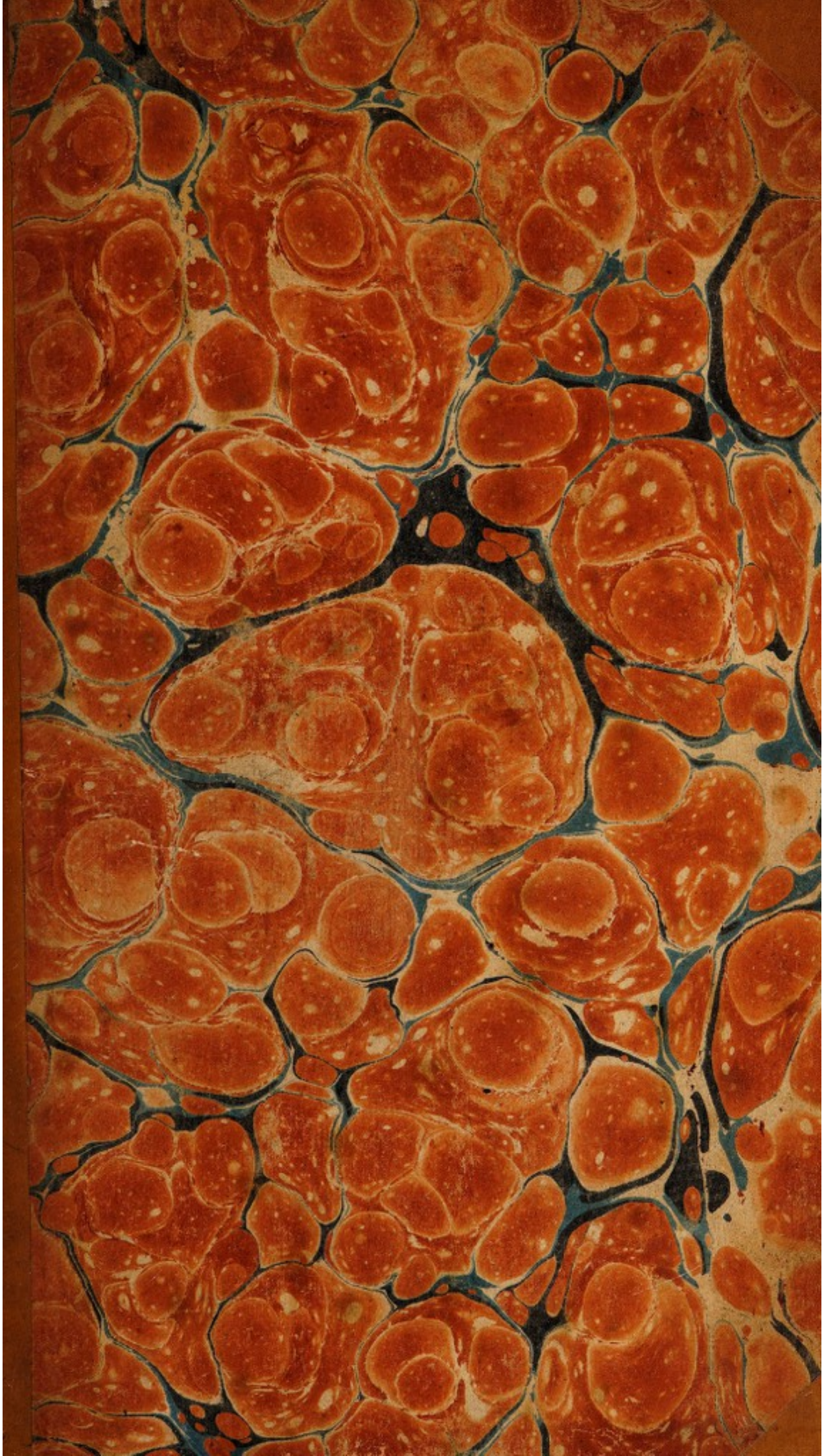
Pathological inquiries ; or an attempt to explain the phenomena of disease and philosophically to direct the methods of cure / [Sir George Smith Gibbes].



Pathological inquiries
By George Smith Gibbes

20-1

23

28-9

30

34

43, 4, 5

48

58

60-1-2

63-7

70

X 71

76-7

78-80-1 X

86-7

INTRODUCTION.

1.—It is impossible for even the most careless observer of the phenomena of nature, not to admit that terrestrial existences mutually co-operate in the production of determinate results. And as these results are conformable to every idea we can form, of purpose and design, it requires but very little reflection to admit, that such phenomena were intended, and ordained, for the end they answer in creation.

2.—Whoever reads the works of Derham, and of Paley, on this subject, must admit, I conceive, the conclusions they draw. Paley observes, that "there cannot be design without a designer; contrivance without a contriver; order, without choice; arrangement, without any thing capable of arranging; subserviency and relation to a purpose, without that which could intend a purpose; means suitable to an end, and executing their office in accomplishing that end, without the end ever having been contemplated, or the means accommodated to it. Arrangement, disposition of parts, subserviency of means to an end, relation of instruments to a use, imply the presence of intelligence and mind."

3.—It is not necessary in this place to shew the general adaptation of the world to the purposes of animated beings. The science of astronomy points out the laws which govern the motions of the sun, moon, planets, &c. by which the earth is lighted, warmed, and cherished; and the trackless sea made subservient to the uses of man;

seasons with the seed time, and harvest, by which he is fed, are the easily comprehended result of these motions; as well as day and night, exactly suited for his activity and repose. The natural philosopher traces these laws of the heavenly bodies, and finds them engaged in producing their effects on all the inert matter of the globe; thus establishing the simplicity, as well as grandeur of these operations of nature. The smallest atom of matter of which the globe is formed, is involved with the largest orbs in strict obedience to the general law. By the acquaintance thus acquired of the general principles, mankind are enabled to direct and adapt them to particular purposes; thus establishing himself, in accommodation and comfort, over the surface of the globe. Although the general laws of nature can never be altered by man, yet he has the power of arranging them in an infinity of ways; and thus does an acquaintance with them, enable him to produce the most unerring system of accommodation and comfort.

4.—Mr. Derham adduces in his book intitled Physico-Theology, numberless instances to prove the wonderful adaptation of means to ends throughout the world.—He observes, "that having taken a transient view of the structure and lodgment of the parts of human bodies; let us next consider the admirable provision that is made throughout man's body, to stave off evils, and to discharge them when befallen. For the prevention of evils, we may take the instances already given, of the situation of those faithful sentinels, the eye, the ear, and tongue, in the superior part of the body, the better to descry dangers at a distance, and to call out presently for help. And how well situated is the hand, to be a sure and ready guard to the body, as well as the faithful performer of most of its services; the brain, the nerves, the arteries, the heart, the lungs, and in a word, all the principal parts, how well are they barricaded, either with strong bones, or deep lodgments in the flesh, or, some such the wisest, and fittest method, most agreeable to the office, and action of the part. Besides which, for greater precaution, and a farther security, what incomparable provision has the infinite contriver of man's body made for the loss of, or, any defect, in some of the parts we can least spare, by doubling them; by giving us two eyes, two ears, two hands, two kidneys, two lobes of the lungs, pairs of the nerves, and many ramifications of the arteries and veins in the fleshy

parts; that there may not be a defect of nourishment of the parts, in cases of amputation, or wounds, or ruptures of any of the vessels And as man's body is admirably contrived, and made to prevent evils; so no less art, and caution, have been used to get rid of them, when they do happen. When by any misfortune, wounds, or hurts, do befall, or when by our own wicked fooleries, and vices, we pull down diseases and mischiefs upon ourselves, what emunctories, what admirable passages are dispersed throughout the body, what incomparable methods doth nature take, what vigorous methods is she enabled to make, to discharge the peccant humours, to correct the morbific matter, and in a word, to set all things right again."

5.—Derham continues—"The body (says Dr. Grew) is so contrived, as to be well enough secured against the mutations in the air, and the lesser errors we daily run upon; did we not in our excesses of eating, drinking, &c. or some other folly, let in the enemy, or lay violent hands upon ourselves. Nor is the body fitted only to prevent but also to cure, or mitigate diseases, when by these follies brought upon us. In most wounds, if kept clean, and from the air, the flesh will glue together, with its own native balm. Broken bones are cemented with the callus, which themselves help to make." And so he goes on with ample instances in this matter, too many here to be specified. Amongst which, he instanceth in the distempers of our bodies, shewing that even many of them, are highly serviceable to the discharge of malignant humours, and preventing greater evils. And no less kind, than admirable is this contrivance of man's body, that even its distempers should many times be its cure; that when the enemy lies lurking within to destroy us, there should be such a reluctancy, and all nature excited with its utmost vigour to expel him thence. To which purpose, even pain itself is of great and infinite use, not only in giving us notice of the presence of the enemy, but by exciting us to use our utmost diligence and skill, to root out so troublesome and destructive a companion."

6.—So obvious is the fact that there continually pervades the system of our bodies a principle, which operates in the defence and preservation of the several organs destined to the continuance of life, that its existence is indicated to us by a very superficial investigation into the laws which regulate the functions of the animal economy.

7.—This principle is so well pointed out to us by a variety of circumstances, which are hourly occurring, and that too without the least deviation from a state of health—circumstances indeed, which from the frequency of their repetition are utterly disregarded, that even in the earliest dawn of medicine, it appears to have seized on the attention of physicians. The observation of Hippocrates himself appears evidently to have extended itself to the knowledge of a reparatory power in the constitution; and although the view which he would seem to have taken of the subject was extremely limited, and confined to a few individual instances, in which it is most commonly exemplified, it is worthy of remark, that his opinion in this particular was the result purely of observation; and that observation exercised at so early a period, doubly claims our attention; because, prior to so vast an accumulation of undigested systems of plausible theories and specious hypotheses, which have since prevailed, there was less to confuse or cloud the imagination of the observer—from the absence of any favorite system there was nothing to induce modelling or subverting the facts, but they were presented to the mind in their most true and unsophisticated form.

8.—Since the time of this physician, the same subject has been glanced at, at different periods, and made conformable to the respective opinions of a vast variety of authors, amongst whom we might enumerate the several names of Sydenham, Stahl, Perrault, Nichols, Mead, Gaubius, and Boerhaave.

9.—Dr. Stahl has succeeded in a more eminent degree than any of the other writers mentioned, to attract the attention of the world to his peculiar opinions as connected with the principle now under consideration; and notwithstanding the vast absurdity with which his system was so abundantly supplied, it continued to prevail throughout the whole continent of Europe for more than half a century, and even until this day it is not entirely effaced.

10.—A perusal of his works will enable us to discern that he had an indistinct idea of the subject; but that he was neither aware of its extent, nor of its applicability, not only to the reparation of injuries sustained, but to the ejectment of those causes from the constitution to which such injuries might accrue—it will also lead us to lament that in his enquiry he had not confined himself rather to the object of increasing the volume of the facts, than to

attempt at determining the first source from whence this principle was derived; an attempt which, as it reduced him to the necessity of adopting words to which no definite meaning is annexed, has perplexed the subject, and rendered that unintelligible, vague, and of little value, which would otherwise have been important.

11.—The principle which involves the many healthful operations of nature for the prevention and cure of bodily disease, is one which is so very self-apparent, that to an inconsiderable extent it has not failed to have been observed by every physician of any discernment whatsoever; it will therefore be understood that in the present investigation, the object in view is not so much the developement of a principle before unknown, as to demonstrate to the world the universality of its application, and its extreme utility in indicating to physicians the means to be adopted for the relief of injury in their co-operation with these salutary works of nature.

12.—The principle now before us, which I purpose to investigate, may be divided into two parts: the first consists of the power with which all animal bodies are endowed of averting, or repelling causes which would be productive of injury; and the second, of the almost unlimited power with which they have been provided, of repairing injuries by their several processes, when they have been sustained.

13.—I shall consider these distinct modifications of the one principle under different heads, and commence with the provision which has been made to effect the removal of all noxious agents from the body.

14.—The more extensively we examine the operations of nature, and extend our view to the several ranges of the created world, the more distinctly do we descry the vast and almost incomprehensible design which has been evinced by the Creator to the single though beneficent purpose of our preservation.

15.—If we confine ourselves simply to the consideration of the structure of the organs and their reciprocal adaptations, which enter into the formation of those which we denominate animal bodies, we are struck with admiration; but this admiration heightens itself into amazement if we view in combination the animal and the vegetable kingdom. From considering these different departments of

the creation in conjunction with each other, we see at once that in each the design which has been pourtrayed, demonstrates to us, that the great object in the construction of every individual species has been to afford them their respective means of defending themselves alike, from the deleterious operation of noxious causes, and to repair by their process of renovation the consequences of such causes when they have obtained.

16.—It is not confined to the animal kingdom to hold themselves in possession of these defensive faculties; but the same laws extend themselves even to the meanest vegetable; and in fact it would appear upon a little scrutiny of the subject, that nature has not been less solicitous in her care of plants, than animals even of the higher order. It is true, she has not provided them with means so complex and elaborate as in these; but the comparative simplicity of their organization has rendered them unnecessary, and as they rise gradually in the scale of the creation, so they proportionably increase in their degree of perfection.

17.—So beautiful is the connection naturally subsisting betwixt the animal and vegetable departments, that in its contemplation the line which determines their distinction is inevitably effaced—the fine and almost imperceptible gradation with which they are connected with each other, renders it impossible to define their respective limits—and we are led rather to regard their discrimination as at least unnecessary or artificial.

18.—If we contrast the two extremes of the animal and vegetable kingdoms, their disparity might perhaps authorize the distinction; but if instead of this, we trace slowly, step by step, through the intermediating bond of connection, their dissimilarity gradually breaks upon the mind, and we see the existence of this connection from the cabbage to the very giant.

19.—I am led to these remarks, because, it is to be observed, that the same laws to which the organs of animal bodies are subservient, apply in some degree to vegetables; and, at all events, I shall proceed to shew the analogy which subsists between them in the particular principle of their instinctive means of individual preservation, and furthering the duration of their vitality.

20.—Plants are said to vegetate, animals to live—they

both are said to die; but in either instance there are processes ordained, which tend in a degree, more or less extensive, in proportion to the perfection of their organization, to avert the occurrence of the irrecoverable state of death.

21.—In plants our observation can only extend itself to the means which they possess of avoiding or repairing the injuries inflicted from external causes; we are unable, as in the instance of animals, to recognize the vast number of salutary efforts which are continually taking place to rectify derangements, which would otherwise occur from causes of a more internal operation, because we are not possessed of means of detecting these changes as they are produced.

22 —As far however as our opportunities will permit, we have reasons for concluding that the disorders of plants are equally frequent, and are instituted for the same most beneficent of purposes as in animals—we observe them one day languishing, and the next revived; they are at one time lively and erect, and they are shortly afterwards drooping and about to perish—in fact, the several changes which they undergo are not less frequent or sudden than the changes which take place in animal bodies, indicating to us that which we erroneously designate by the term disease. As regards the operation upon them of external causes, and the means which they possess of averting the consequences which result from them, we are enabled to arrive at more positive conclusions; we are enabled to observe that they possess to their fullest extent the powers, not only of preventing the infliction of certain injuries, but of averting death by repairing the effects of such injuries which could not in the first instance be repelled or averted.

23.—The generality of plants possess the power of acting against external causes only so far as the evil against which they have to contend is not mechanical. Mechanical powers they are unable to resist, and they are therefore, for the greater part, placed in the same situation with animals, supposing them to be deprived of their voluntary muscles—in animals these are the engines which alone enable them to operate against all mechanical powers to a certain extent likely to bear with them consequences of an evil nature, or in any ways incompatible with the well-being of the system; but in plants it very generally obtains, as they

are less perfect in their organization—that they are neither endowed with a contractile power capable of repelling external mechanical agents, nor have they any thing substituted which is equivalent in effect.

24.—This however is only a general observation, and one which does not universally apply; for as we ascend to the higher order of plants it becomes extremely evident that they are endowed, not only with sensation to a very considerable extent, but that they are possessed of a power which, by enabling them to contract, provides them with a means of contending with mechanical agents, and renders them analogous, though in an inferior degree, to animals of the more complete organization. Those plants which are not provided with the means of contending with the agency of mechanical powers, in their being endowed with a contractile property, are taken care of by other means; and I think, were we acquainted with their entire economy, it would appear that nature has not been less anxious for their preservation, than for the preservation of those which it would seem are more perfectly constructed.

25.—Nothing can better demonstrate to us that every plant, however imperfect it might appear to us in its organization, is adapted to the several circumstances under which it has to vegetate, and to the number and nature of the evils to which it is liable to be exposed, than that a vegetable, which is indigenous in one situation, will either cease to flourish in another, or will die as soon as it is removed.

26.—The adaptation evinced in this particular on the part of plants, renders it extremely probable, that the same species of provision has been made, as they are unable to contend with powers which are mechanical, to increase in them either their capability of resistance, or to chuse for them such situations as might expose them as little as possible to evils of their nature. Are we not borne out in this opinion by our experience? and is it not to be remarked that generally speaking, the bulk and consequently the resisting power of plants, bears a proportion to their height, which would tend, under an inferior degree of thickness, to lessen resistance, and expose them to more frequent injuries?—where this is not the case, and in those instances where the bulk and height are disproportioned to each other, the stem of the plant will be found to be of such elastic and pliable form as by yielding to any external force, must greatly lessen

the consequences of its application.—These several means of averting evil are such as are uniformly adopted, either separately or connectedly, for the preservation of plants, in affording them a defence against the operation of external mechanical agents; and it is equally evident means are provided to them, not only for the annihilation of mechanical, but also of physical operations.

27.—Although it is not less evident that such a power is possessed, it is more difficult to recognize the instances in which it is displayed; because as they fail to be obvious to our senses, its existence is capable of being defined but by a process of deduction; the conclusion is however almost directly attainable, if we reflect upon the several states to which plants are capable of being reduced, and which are sometimes extremely different, without incurring their extinction.

28.—The most remarkable of these changes regards the different temperatures under which they continue to survive and vegetate; the sudden vicissitudes from heat to cold, which from the situation in which they grow they are so frequently exposed to, in many plants appear to exercise on them no baneful influence whatsoever, in others to operate even beneficially, and in those only which are less perfectly constructed does it ever accomplish their destruction.—This extraordinary circumstance implies an internal accommodating power on the part of plants, enabling them to operate against the agencies of cold and heat, and is further pointed out to us in the fact that they admit of being translated from one latitude to another without inevitably producing their annihilation.

29.—I have now taken a general survey of the means which are provided to every species of plant to defend it from the effects of external causes of whatever kind, whether physical or mechanical; in the possession of such means plants are analogous precisely to the species of the animal kingdom, and like these they also are provided with processes of reparation where injuries have been sustained.

30.—In proof of the repairing power of plants it is necessary only to advert to the healing of wounds which are inflicted upon the trunk, stem, or any other part essential to their existence; this instance will be sufficient, because as the object of my remarking upon this subject is to point out the identity of the laws by which both plants and animals are regulated, and to prove the existence of a prin-

ciple applicable to either for the purpose of prolonging the continuance of life, a better example could not be chosen—it is precisely analogous to the process which is instituted in the most perfect animals for the cure of wounds, of whatsoever part; it differs in no one respect from the process, which in the human subject is termed the process of granulation, and which is uniformly the method which is naturally adopted in every description of plant, provided that wound does not extend itself beyond the power of the repairing principle.

31.—This effect of reparation in the example of wounds is not to be promoted by any external application, it is a process naturally instituted for the healing of the wound, and it is a process which is so firmly established to this very beneficial purpose, both in plants and animals, that it is not a little of unnecessary interference that can subvert the accomplishment of its end. The vessels which are divided in a tree by any accident pour forth a species of gluten, which although it differs chemically from the gluten which effuses itself when a wound is inflicted on the leg or other part of any animal, it so far resembles it, that it is of a similar consistence, is there retained until the vessels from which it was poured forth have elongated, and stretching themselves through the connecting mass attain the opposite side, the gluten is then said to be organized and the wound is healed.

32.—This is all that I shall observe respecting plants, and I think what I have observed will be sufficient to shew that much of design has been displayed by the Creator to the end of preserving them and perpetuating their existence.

33.—It is no small confirmation of the correctness of the opinion, that the preservation of the different species of animals has been the great object held in view at the time of our creation, that the more widely we examine into their individual construction and organization, the more satisfactorily are we guided to this important conclusion.

34.—I had meditated in this place to speak somewhat at length on the subject of comparative anatomy, because I am convinced, however stubborn would be the operation of prejudice to oppose the admission of this preserving principle, it must necessarily yield to the many self-evident and undeniable instances in which it will be discovered to

have been exemplified in the consideration of this most pleasing science. It is a science however of such very comprehensive limits, and the existence of this principle is so well attested, by attending to the method and provision which is evinced in the constitution of any even of the most imperfect animal, that I shall content myself with remarking on some of the most obvious examples.

35.—Were all animals similarly constituted, the different circumstances under which they are in their different situations placed, must inevitably be destructive to all those which were not adapted for the one individual place in the creation.

36.—It has not been the intention of nature that all animals should be the inhabitants of one and the same element, and she has accordingly adapted them to the particular element for which they were intended—this adaptation implies contrivance, and the end of this contrivance, as it consists in supplying them with appropriate organs, is the preservation of the species.—What can be more evident than that this has been the object of the provision? —or is it possible to shew that any of the organs, or that any part of the apparatus of any individual organ, has been supplied to them in one single instance to cut short the duration of their existence?

37.—As the performance of the several functions, both of animal and automatic life, tend to an expenditure of the solid and fluid parts which enter into the composition of the animal, so a continual supply of aliment is requisite to renovate and reproduce them.

38.—The nature of this aliment differs very essentially in itself, as appropriated to different animals; and in every animal there has been accordingly provided a digestion suited to the assimilation of the appointed food. Some animals are carnivorous, others are herbivorous—the gastric juice which in the process of digestion acts upon the one, produces no effect whatsoever on the other, and vice versa.

39.—Depending on the particular food suited to the animal, so is there provided also by nature means, which in some instances even become elaborate and of delicate contrivance, to facilitate to the particular species the power of obtaining it. The woodpecker, for example—as it is destined to live principally upon insects, and as these insects commonly inhabit the holes or hollows which are produced

in trees as the effect either of decay or accident, so it has been provided with an instrument solely for the purpose of procuring to itself this kind of sustenance. It is provided with a bill which enables it to pierce the trunks of trees, and having discovered its prey, it is enabled by means of its tongue, which is several inches in length, to catch it and convey it to its mouth. A similar apparatus has not been supplied to every bird; because, as their aliments are ordained to be of a different kind, it was not requisite; but this much is certain, that if in this instance such a contrivance had not been displayed, the animal must have perished as soon as it was produced—it is in fact instituted for its preservation.

40.—A comparison of the formation of the mouths of different animals, whose proper aliment is different, pourtrays the same species of provision—the mouth of the graminivorous is differently constructed from that of the carnivorous animal, and that of the omnivorous differs essentially from both.

41.—The camel is an animal to whom, as to most other animals, the conveyance of fluids into the stomach is under certain circumstances absolutely essential; but as its place of habitation is ordained to be those situations in which little or none of this fluid is procurable, the article is not dispensed with, but nature has given him a more complete organization, by providing him with a stomach capable of retaining water unchanged in large quantities for a very considerable length of time. This provision enables him to perform those distant journies over desert country to which he is habituated; without it he must perish; it preserves him—and thus demonstrates to us another proof of that beneficent care which has pervaded and regulated the construction of the whole animated world.

42.—The method in which the different kinds of fish are constructed—enabling them to live in their peculiar element; and also the admirable contrivances which have been displayed in the adaptation of the organs of the feathered tribe, tend to the same conclusions.

43.—Upon these I shall not particularize; but a circumstance which is observable in and almost common to every kind of animal, is the care which is evinced for its preservation, even before it has been developed. In mammiferous animals sustenance is provided for a considerable

time previously to the birth of the offspring; and even whilst within the womb, there are contrivances which indicate to us the same care and solicitude for its safety as at the period of its maturity—the foramen ovale and ductus arteriosus are here particularly alluded to, not that they are the only instances, but because they are the most obvious and explicable.

44.—Speaking of the mammiferous, we come directly to the consideration of man himself—he is a mammiferous animal; and differs only from the quadrupeds of this class in the more complete developement of his organs—the same laws which obtain in one economy extend themselves to the other—there are laws to which they are alike subservient; and as it has been shown that in their construction, as in the creation of the whole animated world, individual preservation has been the leading object, so there can be little reason for doubting that the same principle obtains in his organization.

45.—Nothing can render this opinion more manifest than to observe in the human body, the care which has been taken of the most tender organs, or rather, I should say, of those organs the most indispensibly essential to our existence—the brain, for example—in what an exquisite manner is it protected, and how great are its resources against the occurrence of accident! A trivial injury of this organ is sufficient frequently to produce death: it is accordingly therefore completely encased in a bony cavity, which would of itself defend it against any ordinary degree of violence; but it is not confided simply to the defence which this circumstance affords it; but the manner in which the casement is constructed, in its being *vaulted* and thus made to resist external pressure upon the principle of an arch, renders it additionally secure.

46.—It is further to be remarked, that as every part of that organ, commonly termed the brain, is not equally destructive of life on its reception of an injury, it has wisely been ordained that those parts, which are the most delicate and immediately necessary to the continuance of the funcions of life, are more carefully defended against the operation of external violence, than others which are less essential.

47.—The anterior lobes of the brain will bear very considerable injury, and even removal to a certain extent, without producing death; the skull therefore in this situa-

tion is, both from its thinness and formation, less capable of offering resistance to mechanical violence.

48.—As we recede back towards the spine, the degree of injury required to occasion death is gradually decreased; the defence therefore is proportionately increased; and when we have arrived at the cerebellum, the skull has attained its utmost thickness and density in the occipital bone.

49.—The very many functions which the brain has to perform, in its holding the empire both of the mind and body, renders necessary a continual supply of blood to its vessels; so evident is this, that its absence but for a short time gives rise to the cessation of the animal offices.

50.—For this reason, and to obviate the effects of accident, nature has not contented herself with giving to it a supply of blood, as is the case with other organs, by one single vessel; but, to insure its continuation, she has rendered to the brain a quadruple circulation, and has so disposed of the vessels by which it is conducted, that it becomes a matter of impossibility that they can all at the same moment be exposed to the same accident. By providing it with two carotid arteries and two vertebral, the former of which she has placed on the anterior, and the latter on the posterior part of the neck; it is so ordained, that if the one set should be obstructed, the circulation might be continued by means of the others; and that one set of these vessels is sufficient to maintain life is already proved by the fact, that the carotid arteries have been obliterated in quadrupeds, and the animal has continued to live.

51.—The same operation has been done on one carotid artery of various individuals of the human subject, and they have survived it; which leaves us room for the conclusion, that the vertebral arteries are sufficient for that degree of circulation in the brain which is requisite to the continuance of life.

52.—The circulation, however, of so large a quantity of blood through the brain, would unavoidably expose this organ to considerable danger, had it not at the same time been provided that there should be given to the vessels such a tortuous direction, as by impeding the rapidity of the blood's progress, would obviate the chance of a rupture in their coats and of thus being productive of mischievous consequences. This tortuous course of the carotid arteries

is more perfectly and beautifully pourtrayed in the construction of all graminivorous and other animals whose heads, from their continually bending posture, would be more prone to suffer from these causes.

53.—The chest, which offers the next best defence against accidents, includes the remainder of these organs which are directly essential to life—I mean the heart and lungs; whilst the abdomen, which is the least defended, contains those only which are not primarily but secondarily connected with the continuance of life—such are the alimentary canal and the several secretory organs of the liver, the kidnies, &c.

54.—The consideration of any of these viscera would point out to us numerous other beauties, demonstrative of that widely extended principle of preservation which attaches itself to every organ of the human body.

55.—The anatomy of the fauces, and the mechanical contrivance displayed for the prevention of the passage of extraneous bodies into the trachea, is similarly instructive.

56.—It would be a matter of much facility to extend this investigation to almost any length; but concluding that what I have already said, relative both to plants and animals, even to the most perfect of created beings, man, is sufficient to shew the perpetual existence of a principle throughout the entire chain of the creation useful to the end of averting death; I shall at once descend to the enquiry, as to what is the real state of those changes which are constantly taking place in the system of man, which we designate, I think, erroneously by the term *disease*.

57.—The author of these remarks, for a long series of years, has been in the habit of attending to the different phænomena of those changes of the constitution, comprised under the term disease; and from an attentive examination of their several dependencies and connections, is inclined to the opinion that disordered actions in the human body, are the means which are employed by nature for the removal of offending agents, and, consequently, the prolongation of our existence.

58.—A question in this place naturally arises, if this opinion be correct, whether or not it be pretended to deny that there is any such thing as disease at all? I think it is only necessary that the matter should be explained to satisfy us upon this particular.

59.—It is well known that all mankind are doomed to die; and the period at which this event takes place is pretty accurately determined; if this denunciation be acknowledged, it necessarily follows, that there must be powers in the constitution destined to defend us from the premature accession of death, and that our vitality is preserved by natural laws.

60.—The action of these laws, for the preservation of the body constitute, I conceive, the symptoms of disease; and these actions, taken collectively, constitute the disease itself.

61.—It appears to me to be demonstrably true, that we might as correctly conceive any irregularities of the heavenly bodies, though producing in every direction complete correction in their ultimate motions, to be diseases and disorders of the solar system, as that the corrective laws which regulate the animal economy should be considered as such. The wise Author of the universe has established laws which promote, support, and correct where irregularity occurs, the system of the human frame, as well as the system of the world generally, and these laws act to the preordained extent, and duration of the subject.

62.—Thus, although all men must die, it does not follow that thousands and millions should meet a premature grave, or that the short period of life which is allotted to so large a portion of mankind should be marked by pangs and anguish, which have no beneficent purpose, or which could be followed by no ulterior advantage.—The pains which follow in the train of debauchery, or any unnatural modes of life, may prove morally corrective of the errors that occasion them; and it is in the physical irregularities that are thus produced, that I contend there is a reparation of the physical frame. If these correctives are not attended to—if the causes are continued which produced them, a period must arrive to the resisting powers of nature; the frame must be destroyed, and organic injuries must arise, and quickly subvert the constitution. How could mankind live in the most variable climates, or digest food of every sort and difference, did not the original laws accommodate themselves to such particular circumstances? And how could the frame exist, were it not for these wise laws of nature, when under every kind of disease, and under every diversity of circumstance, the

same stomach acts and the same organs produce their respective functions agreeably to these altered necessities?

63.—Health may be defined to be that state of the animal economy in which there is no cause existing to interrupt or disturb a certain series of natural actions.

64.—Whenever any part of the human body is interrupted in its natural functions by any offensive agent, certain constitutional powers are called into action to effect its removal. The exertion of these constitutional powers is to be considered as a curative process adopted by nature to liberate herself from the offending cause.

65.—These powers, the result of a re-action in that part of the system which is disturbed, have been supposed to be the symptoms of disease; hence the attention of the practitioner has been directed to the removal of the re-actions rather than to the dislodgement of the cause. How can a cause producing efforts of resistance, or the re-acting efforts themselves, be called disease? Neither the one nor the other comes under the strict meaning of the term. We may perhaps define disease to be that state of the human constitution, wherein the natural re-actions against offending agents are not sufficiently powerful to avert their mortal tendency; and according to this idea the following principles may be laid down—

66.—1—That there are some causes, among which the most obvious are the external, capable of producing disease.

2—That the tendency of disease is either to spontaneous cure, or to the extinction of life.

3—That the organs of an animal stand in various relations with each other; that the medium of their relation consists generally, if not always, of a nervous connection.

4—That these organs influence each other in disease, or that the state of disease which one organ has assumed may influence the condition of another, although no very intimate connection should be exhibited between them in health.

5.—That when disease takes place in one organ, or in one part, the influence which such a state of disease has upon another organ, or another part, is to produce a change in its function; which change, though furnishing an additional symptom of disease, is nevertheless curative, in regard to that which occupied the original seat.

6—That this case holds good only to a certain extent; or more definitely that the success of the curative processes

is dependant—1st, upon the force and nature of the cause —2dly, upon the degree of the disease—and 3rdly, on the organ in which it takes place.—Thus,

7—A determination of blood in the brain produces disorder of the head; a rupture on its surface may produce hemiplegia; and a rupture of a blood-vessel near the origin of the eighth pair of nerves would produce an immediate death.

8—That in disorders not incompatible with the continuance of life, a secondary disease, which succeeds as a consequence of a primary one, is remedial in regard to its own cause—that if a third, a fourth, or a fifth function is disordered, the general tendency of these consecutive affections is to cure the primary one; and that to this end they all concur.

9—That just so many functions undergo a secondary derangement as are requisite for the cure of the primary one.

10—That if death happen in the course of the processes, whose effect would otherwise be remedial, the event takes place from a deficiency of vital energies to sustain the actions which are preparatory to the cure.

11—That these tendencies to secondary disease are a provision against the effects of unnatural living; and are possessed though rarely exercised by animals whose appetites are purely instinctive. That in such, the primary disease rarely takes place; and that in them, the same mode of cure is often exhibited when the primary does occur as an effect of domestication.

67.—Diseases therefore under this idea are not the causes of death; they are formed by the re-actions and exertions of the constitution to repel those causes which would produce it; but these exertions having failed, death inevitably supervenes from a default of power in the constitution to avert its occurrence.

68.—To render this explanation of disease still more intelligible, we will suppose an instance in which a man receives a blow upon his head, or indeed upon any other organ, essential to his existence. The direct tendency of that accident is to suppress immediately the vital functions; the action of the heart is first impeded; it is rendered slow, and the circulation is depressed; and if this state of depression did not speedily yield to a salutary effort on the part of the constitution, death must supervene—what then is the salutary process which nature under these circumstances occasions? It is that which we denominate

re-action; it is a power by which the circulation is restored, and the extermination of life is accordingly averted.

69.—A better example of the successive re-actions which take place in the human frame, to counteract the effect, and finally to remove the noxious agent, cannot be taken than in the phenomena attendant on common drunkenness. Here the offending cause is taken into the stomach, and successive portions are applied, each portion still augmenting the excitement until (were it not for some compromising principle in the human economy) inflammation, mortification, and death would ensue. When, however, a given excitement is brought about, the blood vessels, nerves, &c. of the whole constitution become affected; the face flushes; the blood flows in a more rapid manner towards the head; and the effect of the liquor is displayed in the altered mind and disturbed state of the sensorium. Did this state of things continue to increase, and was there no provision against the over-distension of the vessels of the brain, that organ would soon be the seat of fatal excitement, or destructive compression. But when the brain becomes affected by excitement and pressure to a certain extent, the compromising principle again acts, the stomach by its connection with the brain is thrown into action, vomiting is excited, and the original cause of all the tumult is forcibly expelled from out the body.

70.—The inflammation of the brain in this instance, according to the usual acceptation of the term, might be termed disease; and as it matters not by whatever word the natural efforts are implied, there is no objection to the term; but it is only necessary that it should be understood, that what we commonly call disease, is uniformly a salutary operation to the end of averting death.

71.—If the inflammation in this example had not supervened to the infliction of the injury, and from a want of power in the constitution, no re-active process had been instituted, the patient must have died; it is therefore more correct to say that we do not die of disease, but because the efforts of the constitution are unequal during the existence of disease to avert the fatal termination. But the inflammation thus supervening may itself become a source of danger; in this, however, as in other instances which will be considered hereafter, we shall find the same provision of a compromising principle acting towards the preservation of life.

72.—Although this is the definition of disease which I consider the most suitable to the phænomena, I shall not entirely discard the term ; but adopt it without hesitation in this inquiry, as often as its use shall be deemed necessary.—I shall commence with the minor instances in which the innate tendency of the constitution to defend itself from the action of noxious causes is exemplified.

73.—It appears to me that a muscular power is uniformly exerted for the purpose of removing, or rather preventing the operation of noxious agents; and that the several organs of digestion and circulation, are the organs which are effective in accomplishing the removal of injury where it has been sustained ; thus it is a muscular power which repels the operation of any irritating substance upon the schneiderian membrane; it is the same if the substance fall into the trachea; and if this muscular power were not exerted, in consequence of the irritation, the injury might be said to have obtained, and a vascular effort would be made to bring about its removal, in the production of inflammation.

74.—If any poisonous substance be admitted into the stomach, a muscular power is first called forth to assist in its expulsion by vomiting; if this be not adequately produced, the assistance of the vessels is elicited, and inflammation is produced.—Thus, I say, that in the first an endeavour is made on the part of the constitution, to resist the infliction of any injury, by means of a muscular power; and if this fail, and the injury be inflicted, the process of reparation there rests with the digestive organs, or with a suitable change in the circulation.

75.—In this attempt at generalization I am, perhaps, not correct; but, at all events, a separate consideration of the salutary processes of the constitution, as connected with the digestive or circulating organs, will be attended with advantage, in rendering the subject less complex and intricate.—I shall begin with the digestive organs, premising it with a few general observations as applicable to both.

76.—If any extraneous substance irritate the membrane of the nose, the diaphragm, by its associating nerve, is thrown into action, and sneezing expels the substance; diarrhæas carry off noxious matters; and the emunctories of the body are generally cleared out for the same purpose.

77.—Dr. Grew says, "Nor are diseases themselves useless; for the blood in a fever, if well governed, like wine upon the fret, dischargeth itself of all heterogenous mixtures; and nature, disease, and remedies, clean all the rooms of the house; whereby that which threatens death, tends, in conclusion, to the prolonging of life."

78.—The human frame re-acts against mechanical, as well as chemical agents; thus a piece of hard substance excites the secretions of tears when it is introduced into the eyes, which tears wash out the substance; and sapid bodies excite the saliva, which dilutes the solid ingredient. A calculus passing the ureter excites vomiting; and a hernia is drawn back by a countervailing retraction of the omentum by the stomach. A gall-stone excites vomiting, and the bile by that process is forced into the duodenum, thereby carrying before it the concretion.

79.—Parts are also adapted to the proportion of effect that is to be produced, and an almost involuntary resistance is given against the introduction of noxious agents. The most tender organs are protected with the greatest care, and those most essential to the existence of the body, are placed in parts most secure from accident. Innumerable instances may be found in physiological works, which tend to demonstrate, that provision is made in every part of the human frame for the preservation of the body.

80.—Bichat remarks, that "Life consists in the sum of the functions by which death is resisted." As a machine, the human body may be said to *go*, at the same time that it includes powers for repairing all injuries that otherwise would prevent its going, and in this it differs essentially from every other machine whatsoever.

81.—These reparatory processes include almost all the symptoms of disease. If a substance be taken into the stomach which is not nutritious, or not consistent with the well-being of the frame, a vomiting may expel that substance—this vomiting would be salutary, as it would prevent the evils that might otherwise disturb the body.

82.—If the stomach does not reject this noxious substance, it passes on in the alimentary canal; the liver pours forth an unusual quantity of bile, that bile occasions a diarrhæa, and the noxious substances are expelled; such a derangement of the liver must be considered salutary, and the increased quantity of bile cannot fairly be regarded as disease.

83.—The re-actions of the stomach, and of the liver, must therefore be, in some instances, conceived as efforts beneficially excited to remove noxious agents.

84.—Should this salutary re-action of the stomach be kept down, and should means be employed for the prevention of that sickness, which would, without such interference, have removed the offensive agent, that agent must still remain there, and further and more extended re-actions must be excited for its removal by other organs of the body; and thus it happens, that the liver takes up the business, and succeeds in expelling it through the bowels.

85.—It will be shewn that where the re-actions of the stomach are checked and prevented, that severe bilious affections are often the result, and this result generally arises where liquors of a temperate quality, and which excite stomach re-actions, are superseded by more ardent spirits, which keep down these salutary re-actions. Thus dram-drinking disorders the liver, and the milder liquors the stomach. We may fancy, that in a state of nature, these re-actions are positively curative, but that, in as far as we are perpetually calling forth the necessity of these powers, they must become less able to contend with the evils.

86.—Thus a long series of disorders, called forth by the repetition of noxious causes, must occasion an incompleteness in the resisting means, and thus must other organs be concerned in the curative process.

87 —We will suppose, for example, that the stomach, unable to perform healthy digestion, presents to the liver, as the food passes the duodenum, an ill concocted chyme or chyle—does it not become necessary that the liver should pour forth a bile suited to the purpose it has to answer? A purpose far different from what would be required, if a healthful digestion had taken place in the stomach. Such a bile cannot be deemed improper, since it answers the purpose for which it was intended, namely, of carrying through the bowels what was noxious, and of effectually assisting in assimilating such parts as are healthy and proper.

88.—To attack the liver, therefore, because it has done its duty, would be adding to the evils which had already excited its powers, and would be exhausting those means of resistance and re-action, which were appointed for the most beneficent of purposes.

89.—To oblige, by medicine, the stomach to retain such substances, as in a state undisturbed by medicine it would reject, is the readiest conceivable method for calling forth the symptoms of liver affection, and a general disturbance of the alimentary functions; and thus it happens that the more extended re-actions of the constitution follow these circumstances; and thus, by a very easy process of reasoning, shall we arrive at those causes which produce gout, asthma, cutaneous disorders, and in short a long train of grievous maladies.

90.—During heathful digestion, feelings are excited far different from those which arise when the meal has not been regulated by moderation and sobriety; and how often are means applied to appease the tumult occasioned at such times; and thus so many noxious agents are introduced which become the causes of great and extended future mischief.

91.—The disorders of the digestive organs have been deemed the cause of most diseases, constitutional as well as local. To me they appear to be the cure of such extended operations. We cure distant affections by such means as disorder the digestive functions. We disturb the stomach, and we agitate the bowels, and by so doing we remove constitutional fevers, and check the progress of local excitement.

92.—Re-actions become more general when the alimentary process makes no resistance; and local affections enhance the powers of the stomach in vicious indulgence.

93.—In this manner, the gout allows the stomach a more extended range, and with this painful appendage is a person capable of digesting a larger mass of otherwise indigestible substances. Though the stomach may be offended with table beer, the gout is nourished by madeira; and I think the deep-seated re-action of gout is far less desirable than the curative though troublesome re-actions of the stomach. It is a dear purchase of ease, particularly when moderation and sobriety are sacrificed.

94.—Those persons who feel the most troublesome disturbance in the stomach after a debauch, are not ultimately so much injured as those who carry off without inconvenience the same causes of evil; and those liquors which keep down and deaden, as it were, the re-actions of the stomach, are those which occasion the deepest and most serious maladies.

95.—The disorders of the stomach, the deranged actions of the liver, and, in short, the common and troublesome disturbance of the alimentary functions, are diseases more in idea than reality; and I shall attempt to shew, in the course of the present work, that the practice of medicine, which implies an attempt to remove these affections, has immeasurably increased the evils these re-actions were naturally ordained to remove. The practice of medicine should be directed to assist, and not subvert these natural operations; and in so doing we should be guided by a strict observance of natural laws.

96.—It has been said that foulness of the bowels is a common cause of disease. It appears to me that when the bowels produce the foulness so often observed, such foulness proves curative. It is a re-action of the liver against a constitutional disturbance, which re-action in the end proves curative. Immediately on discovering this foulness, we feel satisfied that on its removal the various symptoms of disease will disappear. I should contend that the process causing foulness proved curative; and that the liver took, as it were, upon itself the management of the cure.

97.—There is a balance in the constitution consistent with every natural effort; it may be called the diathesis, such as of gout, and a variety of other inflammatory affections, and these states of balance involve their own series of phenomena.

98.—Thus the head may be oppressed with a superabundance of blood, and be liable to affections under one form or series; another may involve rheumatism, another gout, and another that cause which produces foulness of the bowels; all of them extended re-actions of the system, tending towards a reparation of the constitution.

99.—It may be observed, that foulness of the bowels cannot exist to the full extent at which it appears at any one period; for the quantity that on some occasions is discharged would be more than the canal was capable of containing. It must be the result of successive depositions from some great secreting organs; for instance, during the existence of diseases wherein there are great determinations of blood, whilst the balance of symptoms involves the inflammatory states of those disorders, aperient medicines bring away evacuations of no particular character; but after a time the circumstances of the case alter—heavy,

lumpy, and discoloured evacuations begin to appear, and by the aid of very gentle means, continue to be parted with.

100.—As soon as these appearances arise, the symptoms of the original disorder begin to diminish, and in the course of a short time disappear altogether.

101.—It must have occurred to every practitioner who has strictly examined these circumstances, that he has found a difficulty in accounting for the quantity and extent of this collection of foulness. It must also have been frequently observed, that affections of the head, epilepsy, chorea, local diseases of various kinds, and great and extended affections of the skin, have all given way as soon as the bowels have expelled a quantity of foul and fetid evacuation.

102.—During the progress, however, of these maladies, the bowels have not shewn the same character until the disorders have obtained a particular stage, and then the progress towards health is decided.—Could we succeed in bringing about this stage, many very grievous maladies might be cured; that is, we might induce thereby the liver and other organs of the alimentary canal, to render the more extended re-action of the system unnecessary.

103.—I do not mean to deny that there is occasionally a very great accumulation in the bowels; so foul a state of them that worms occur, which appear therein to have found a proper nidus; and that other great sympathetic affections take place arising from this accumulation. If we trace these affections we shall find many natural efforts made to remove such accumulation and foulness; and even that many very distant re-actions occur, tending to relieve the body of the grievance. Thus the blood returning through the vena portæ, is delayed, and as the heart acts uniformly, more blood flows to the head than usual, in consequence of this remora in the return of blood from the lower circulation.

104.—This fulness of blood in the head, besides giving due support to the required and additional nervous activity, occasions many re-actions, amongst which we may rank epilepsy, which shakes the whole body in convulsions, and is the means of removing worms and other foulness in the bowels; as under the influence of that disorder the alvine and urinary secretions are expelled. We

shall see hereafter how nervous affections tend to the reparation of the body, and how far the mind is concerned in many processes which naturally obtain in the removal of noxious agencies.

105.—It has been remarked, that the human stomach is an organ endued by nature with the most complex properties of any in the body; and forming a centre of sympathy between our corporeal and mental parts, of more exquisite qualifications than even the brain itself. Yet the knife and eye of the anatomist do not discover the whole important station it holds in the economy; we must look to the living system for those nice connections of cause and effect, and that source of association which give it a relationship to so many organs, both in the healthy and diseased state.

106.—An organ intended for such important purposes in the animal economy must receive from the hand of nature singular tokens of her favour.—Hence we find all those viscera, which assist in preparing the chyle, and what is called the assimilation of the food, joined in a circle of nervous communication, of which the stomach is the centre. Nerves are distributed over the whole; so that while they are employed in one purpose, disorder cannot take place in any of them without the whole being strongly affected.

107.—It would betray a great want of confidence in the acknowledged order of the laws of nature to suppose that all these associated organs were not regulated in their apparently disturbed state, by laws tending to the relief of that perturbation, as well as for the continuance of their more quiet actions. It is, I contend, by these associated powers that the causes of perturbation are removed, and that the effects of such re-actions are eventually rendered harmless.

108.—The nerves of the stomach are derived from the *par vagum*, or eighth pair, which communicates with the great intercostal or sympathetic; and by it, are connected with almost every other nerve in the body. The semilunar ganglion of the great sympathetic supplies particularly the liver, gall bladder and ducts, duodenum, pancreas, spleen, jejunum, ileum, and part of the colon, &c. The renal glands, kidneys, ureters, and bladder; the uterus, ovaria, testes, &c. are all supplied by the same nerve, and joined by others from the lumbar vertebræ. The muscles

of the pharynx and trachea, those of the neck and lower extremities are even connected by branches of this nerve. The lungs, heart, and diaphragm, being all furnished with nerves which communicate with the great sympathetic, it would appear that this nerve is the grand link or chain which connects the vital, animal, and natural functions with one another.

109.—It would be no very difficult matter to trace the curative actions that take place in consequence of this nervous connection; how the mind and body vary in their proportionate power according as the exigencies of the constitution may require; how the heart may vary its pulsations agreeably to the impulses it receives through this nerve; how the liver, pancreas, and intestines generally are apprized of the necessities of varied exertions, agreeably to the kind of digestion that is within the sphere of their duties; how the kidneys become respondent to the impressions on the stomach, &c.; all, I say, for the beneficent purpose of ultimately removing from the system the noxious influence of offending agents; such influence as, were it not for these wise provisions of nature, would prove destructive to the human frame.

110.—These several re-actions of the body seem all calculated to become effectual when the system is in a state agreeable to the laws of nature. A really curative process may be so far altered in its ultimate result, by improper habits of life, that it may not be enabled to answer the purpose intended, or it may run into an excess, and even occasion detriment to the subject. For the sake of illustration, I must venture here to trench a little on a future part of my subject. The controul over the human mind seems to depend upon real animal power, as much as those functions which may be strictly considered purely animal. During sleep, when the associations of the mind proceed uninfluenced by the controul of the will, the animal powers are refreshed, and the mind awakes with repaired energies. Were it not for this salutary quiescence of the mind, the powers of the human body would be quickly exhausted, and its functions would not be performed.

111.—During the absence, therefore, of that power which allows of a controul of the will over the human mind, the animal functions are repaired and restored. It appears that the healthy state of mind and body obtains when the power of the general constitution is complete.

112.—It also appears, that the mind and body reciprocally assist each other; that bodily enervation often enhances the powers of the mind, and that the mind is suspended in a determinate manner to allow a reserve of power to be employed in the reparation and restoration of the animal functions. Thus when the mind is unsettled in delirium, the bodily powers are much improved; and the strength of the body wonderfully increases as the power over the mind diminishes.

113.—This fact could be demonstrated in numberless instances, where the power of the will and the controul over the mind, yield to great animal passions and exertions. If, during the dereliction of the mind, the constitution is strengthened, and a reparation of the body takes place, the delirium of fever, as well as many other aberrations of the mind, may be considered as salutary and sanative. The mind and body alternately supply each other, accordingly as either may be required in the progress of a cure.

114.—Thus we see, that some great passions of the mind remove general constitutional affections, and great bodily power obtains, when the mind is unsettled and disturbed. Many of the animal powers are wonderfully increased when the mind is unsettled; and great excitements of the mind keep off and restrain many constitutional re-actions. The habitudes of the mind influence the functions of the body; and, like other curative re-actions, become the causes of extended recoveries of local and constitutional maladies. We know that men, who, in the quietness of peace, would lose their lives by exposures to the inclemencies of weather, bear, when roused by active service, the greatest hardships and privations. We see that many of the most formidable diseases give way, or are arrested in their progress, as soon as the mind is not under the guidance of reason; and, that during phrenzy, wounds heal and disorders disappear, which threatened, whilst the mind remained sound, the most calamitous consequences. I have seen maniacal symptoms supervening on dropsy, prove critical of that disorder, and life prolonged to an extent hardly conceivable, when mania has occurred in the most threatening cases. It must, in short, be acknowledged by every practitioner, that such circumstances are of very frequent occurrence.

115.—When the mind is in any way affected, I conceive, that then the power which was employed, and

which was necessary to the preservation of the due reasoning faculties, is engaged in another direction, for the purpose of the reparation of the body, and for the restoration of it to that state where again the mind may enjoy its full powers, and be again restored to the full possession of its functions.

116.—We will suppose that the brain, like the metropolis, is the seat of government, and that the nerves, &c. make a communication from the most distant parts of the empire, and that, throughout the system, provision is made against rebellion, or against the introduction of a foreign foe. We will imagine an enemy to land on a distant shore, and that the local re-action repels his efforts; no great constitutional disturbance takes place, since the local power is sufficient for the purpose. If this enemy should overcome the local force, and should advance, a more determined resistance and opposition become necessary; and many contiguous parts unite for the purpose of expelling him. Should however the enemy prevail, and should he advance still further, the government of the country would be obliged to quit the capital, would for a time abandon its common cares, and direct its attention solely to the instant necessities. All its energies would be exerted to overcome the enemy, and when that was effected, it would resume its seat, and its functions go on in the usual manner. Many sacrifices are however often necessary after such a conflict, and many parts of the empire feel, for a long time, the effects of such a mischief.

117.—This appears to be the case with mind and body, and thus is the absence of higher qualifications of intellect, only proportioned to the exigencies in the animal frame; and when that power, which under other circumstances gives force to the reasoning faculties, has served the purpose of repairing and invigorating the functions of the body, it returns to its accustomed seat, again to regulate the whole constitution of mind and body.

118.—This analogy might be carried further, and a number of instances of fever, and a long list of mental diseases, might be produced to shew the general conformity; but it is sufficient for the present purpose to mention general principles, as the details are immediately obvious.

119.—Whenever therefore we see nervous complaints, wanderings of the mind, and the whole list of disorders that involve any alienation of the reasoning faculties, we

may conclude, that the power is elsewhere employed, and that the tendency of such alienation is for the restoration and preservation of the whole animal system. It is thus that the human species remains nearly the same for so many ages; for if we were not to believe that the errors of mankind were corrected after some few generations, the whole race must have been long since extinct.

120.—Predispositions to disease may, in this manner, be supposed to be ultimately corrective of evil. Vicious indulgence produces pains and evils, and extends its baneful influence through many generations; but ultimately it appears that its effects are corrected, and that at the present day, there are as many healthy children born as there were in the remotest periods of antiquity. If it be admitted, that the symptoms of disease may be resolved into a process reparatory of the human frame, and if the alienation of the human mind allow an increased power to be employed in the restoration of the constitution, it appears to me, that such provisions are made for the ultimate protection of the human race.

121.—Such medicines as call forth the re-actions of the stomach, are found useful in the more extended disorders of the constitution; and thus does it, at first sight, appear, that many of the most important diseases arise from a derangement of the digestive organs.

122.—If the powers of the stomach had been allowed to have been exerted in an effectual re-action against the early introduction of noxious agents, and had those reactive powers been attended to, as indicating the baneful consequences of a continuance of bad habits, many very grievous maladies would have been prevented.

123.—Perhaps it is only by retracing the steps of such disorders through the organs originally affected, that any effectual relief can be obtained—by avoiding such habits as originally called forth the re-actions of the stomach, and by forcing the stomach and all other intermediate organs, to re-act against those causes which have proceeded to a greater extent in the constitution. It is thus that operations on the stomach, liver, and bowels, are so effectual in removing many great and extended disorders of the system. Nervous disorders, and all those mental diseases which imply extended reparative provisions, are all influenced under their respective circumstances by such means as call forth re-active exertions in the primæ viæ.

So that whether a disorder originates in the stomach, proceeds to distant organs through the stomach, or is a disease locally inflicted, or arising primarily in any distant part of the frame; still such re-actions are capable of affording relief. For as the stomach is of the greatest importance in receiving and assimilating the nutriment, which is absolutely requisite to the remotest part of the human fabric, so is it at all times equally important in regulating a digestion adapted, under all circumstances, to the necessities of the case, and in all those re-actions which prove curative of the evils that assail the constitution in any part.

124.—Much caution is requisite in ascertaining the stability of the frame on which we act, before we venture to alter the plans already adopted by nature. One state of body as to strength implies one series of phenomena, and disorders often naturally supersede each other, agreeably to the compatibilities of each with that strength; and thus we often see hæmorrhagies, cutaneous eruptions, erysipelas, a variety of local inflammations, affections of the head, gout, &c. succeed one another under every modification, agreeably to the compatibility that the state of the system holds to each individual disorder. The changes in complaints, and the succession of symptoms, are thus to be accounted for, when the detail of this system is explained.

125.—I have assigned myself the task, in the present work, of tracing the natural order of phenomena which diseases present in the regular series of their respective symptoms, and to suggest a practice of medicine resulting from the above principles, and modes of reasoning.

126.—It has been advanced by physiologists, and admitted as a great discovery, as leading to the elucidation of disease, that sympathetic actions take place between distant parts of the bodily frame. Mr. Abernethy, in speaking of Mr. Hunter, says—"here I would ask, who, first with the eye of a physiologist, surveyed the reciprocal sympathies of the several organs of the body, and shewed how the most complex disorders may and do arise from simple causes; was it not Mr. Hunter? Can we (he continues) longer feel surprised that disorder of the digestive organs and poisonous miasmata should equally and similarly disturb the energies of the nervous system, and occasion fever?" He further says, "we now hear no more of those ancient metaphors, concoction and erosion;

but we find all the morbid changes accounted for by the perverted action of the ordinary powers and structures of parts; clearly perceiving that the same powers and organization, which by their natural and common actions produce health and beauty of appearance, do, when perverted, occasion disease and deformity."

127.—From the foregoing quotations, as well as from the opinions every where expressed by these truly estimable physiologists, we find that disorders are propagated in the human frame from one part to another by sympathy; and that if for instance the stomach be disordered, correspondent morbid actions take place in organs sympathetically connected with it, and that constitutional affections are all dependant on the part primarily acted upon, the stomach. That thus disorder and disease of one organ, we say the stomach, are equally and similarly transmitted to all other parts sympathetically connected, and their disturbance is equally and similarly excited.

128.—According to this view of the subject, it appears to me nearly impossible to conceive that the human constitution could ever be in a state of health or of comfort; it is giving to disease a malignant propagation of itself without one ulterior advantage; and the laws which regulate the human economy a general subservieney to all offending and morbid causes. I should rather say, that the power of the stomach against offending causes, was re-active and remedial; and that when distant parts are sympathetically affected, the disturbance that is excited either assists the stomach in its curative operations, or dislodges by itself the cause against which the powers of the stomach had been unequal to contend. Distant parts often co-operate for the purpose of expelling evils; thus the stomach and the liver may, and often do unite their powers in carrying off morbid accumulations; and a distant part may assist organs primarily affected, and excite actions which help to dislodge the offending cause. Thus the stomach, by the concussions arising from vomiting, causes concretions to pass, being sympathetically called into action by the irritation of the calculus passing through the ureters.

129.—Mr. Abernethy has remarked, in his work on the disorders of the digestive organs, that the subject is so important, that the public would be highly indebted to any practitioner who would point out the varieties of these

diseases, and the appropriate modes of cure. A great desideratum in medical science seems to be in what regards first principles: disorders cannot, we may imagine, arise without some cause, or some natural object; an acquaintance with the other phenomena of nature would lead us to discard such an idea. The person, therefore, who can elicit from the phenomena of disease, the causes and the objects of morbid actions, and who can account for and explain the final causes, will perhaps be the most likely to point out the varieties of these diseases, and the appropriate modes of cure.

130.—A person may suffer great uneasiness after eating his meals, and may not for years know a day to elapse without feeling some disorder of the stomach, yet his appearance may bespeak good health, and his muscular powers and ability in undergoing fatigue, may be unimpaired. It is the object of this essay to show, that the trouble experienced in the stomach is salutary, and that greater evils are prevented by such derangements of the digestive organs.

131.—If any deleterious substance were taken into the stomach, and were that substance to excite vomiting, we must admit that such an operation would be a salutary re-action, in as far as it removed the poison from that organ. If any thing were taken to prevent the vomiting, this salutary effort would be destroyed, and the poison would remain to harass the frame. Were this poison to pass the stomach, and a diarrhæa to come on, the diarrhæa would be a salutary effort to remove from the bowels the noxious substance. Were these efforts ineffectual in removing the poison, a series of re-actions would take place, which I will explain hereafter. It is sufficient for my present purpose to shew, that many disturbances arise in the stomach and intestinal canal, which are decidedly salutary, and necessary to the well-being of the whole constitution. A digestion suited to the occasion takes place, whether the stomach be healthfully supplied with food or not. The greater the disturbance when real mischief threatens, the greater often is the safety of the patient. The minor re-actions of the stomach after a debauch, bring about the former health in a greater or less time, according to the strength of the re-active power in the person; but the disturbance here is always more or less salutary. If after a debauch the uneasiness of the stomach

were to be quelled by strong liquors, surely we should find that eventually the constitution would be more extensively deranged. Whilst the stomach is able to contend with evils, the more extended re-actions of the frame are unnecessary. If the stomach contends with and prevents the admission of noxious matters, the other organs of the alimentary process have no contest with them; but if they pass the stomach, by the re-actions of that organ being lulled or stopped, then the liver and other organs are necessarily excited to a conflict for the same purpose, namely, to expel the evil or remove its effects. That many stomach complaints arise from the same cause, and are called forth to act salutarily in removing evils and restoring health, a few facts will I think satisfactorily demonstrate. The admitted necessity of exciting nausea and vomiting in many extended constitutional complaints, shews the use of the re-actions of this organ in the cure of disease. Upon the above principle, I say, that were the stomach often left to itself, and its re-actions, though painful, endured, a more complete cure would ensue, than by the present plan of administering bitters, and in short other drugs and means to allay the disturbances in that organ. Under what limitations such practice may be warranted, I shall now proceed to consider.

132.—The stomach is that organ of the frame, which after due mastication begins the process of assimilating articles of food with the whole human body. It is wonderfully adapted and contrived for the purposes of forwarding the whole digestive operation. Upon the due completion of its duties depend the proper actions of all other organs which are concerned in the process. Thus, the action of the liver must in a great measure be dependant on the sort of digestion which has taken place in the stomach; and thus the qualities and character of the bile vary according to the necessities arising from the same cause. If, therefore, the stomach be prevented from completing its own work, the associating links between that organ and the liver are broken asunder, and more extended operations must of necessity arise.

133.—A diligent and minute attention to the phenomena of disease can alone enable us to build our pathological knowledge upon a philosophical basis. Effects follow causes with the same unerring certainty in the human constitution as in the external world, and the same

inductive method applies with equal force in medicine, as in other branches of natural knowledge.

134.—The human frame is ever subject to varieties of noxious agents, and is as constantly exerting its powers in repelling the hurtful, and assimilating the healthful. In an undisturbed state of body, where every function fully preserves its due balance, health may be declared to exist; but it is far from this state before we can designate the actions of the human constitution to be in a diseased state. The disordered state of the stomach very clearly arises from some error in the food we take, or in some want of care or attention in duly regulating the several general functions of the body. But by these disturbances of the stomach, we learn how to select proper food, and how to avoid many pernicious things daily presented to us. Whilst by these affections of the stomach we are led thus to select our proper food, and by experience thus acquired to feel and know what is best for us; these disturbances are the means that bring about and restore any mischief arising from the circumstance. Thus were we to suffer from poison, which was not to the last degree baneful, we should find that the re-active powers would avert the evil, and would again restore the healthful state.

135.—As the stomach is thus of the greatest importance in the animal economy, it is endowed with very great re-active powers to expel or remove noxious ingesta, and to prevent, as far as possible, the admission of deleterious agents into the general constitution of the body. Stomach complaints, therefore, are the most numerous amongst the disorders of the body, and it is to the stomach that we look, as physicians, to provoke re-actions, for the purpose of removing such evils as have unfortunately been admitted.

136.—Although it may be contended that diseases, generally speaking, are in fact the motions excited for the purpose of opening emunctories, and expelling some offending cause; yet we must not conclude that nature always adopts the safest method, or that her work is always successful. All nature's operations are directed more to general than particular objects; and the particular are only properly involved when the constitution has been regulated agreeably to natural laws. The choice of good or evil rests with us, and natural laws will correct, to a great extent, the evils arising therefrom, and mankind are led by experience to select that which is proper.

137.—Pain corrects morally as well as physically, and unnatural habits are ever accompanied by pain and distress; but this pain and distress inform the reflecting mind the course necessary to be pursued, at the same time that they are the curative re-actions which restore the healthful state of the constitution. The stomach is sickened by noxious matters, or is insensible to their power; if they pass the stomach, other organs are provoked to an action which tends to expel them. Here the physician may rouse the stomach to re-act, and thus prevent the further derangement of the system. Thus the general and extensive disturbance of the constitution, may be easily and often effectually, as in fevers, prevented, by copiously exciting the stomach to reject its contents, therein involving the received cause of evil.

138.—It has been said by Mr. Abernethy, that most constitutional, as well as local diseases, are caused by the disordered state of the digestive organs: upon the forgoing principles, it may be said, that the digestive organs being excited to throw off as emunctories the offending cause, become the cure of general disease, by superseding the necessity of more extended re-active processes.

139.—It occurs frequently that the stomach is excited into great action, and that vomiting is a very refractory symptom of disease. Here we may often trace the cause to a part far removed from the stomach, existing in the lower part of the intestinal canal. Were the stomach to digest, as in health, and forward the progress of fresh ingesta, the accumulation would be fatal; but the stomach guards against this evil. Though this re-action might not remove the evil, yet it plainly leads the mind to adopt the requisite measures, namely, the removal from the lower bowels of the obstruction by the most speedy and efficacious means.

140.—We are led to a knowledge of the state most natural to mankind, by the re-active powers being more or less, called forth. Whether a person be indolent, or oppressed with fatigue of body, under affliction, or lightened by pleasure and happiness, the same stomach must prepare a suitable digestion. Under the extremes of heat and cold, of long fastings, or great repletion, still existence is preserved by the diversified operations of the stomach. Not only does the stomach in this way suit its powers to the exigency of the case, but its associations with the liver,

and the other organs concerned in digestion, are regulated to exert their powers to the attainment of the same object. Thus food either loiters or hastens through the whole digestive operation, retarded often to give time for inactive organs to receive their due supply, or briskly excited to remove speedily any matter offensive to the body.

141.—It was by observing the facts which relate to bodies in motion that the laws were established; by connecting similar effects and tracing the cause, natural philosophy attained a simplicity in accounting for and explaining the laws of matter. By connecting similar symptoms of disease, may we not hope and expect to find some efficient reason for the disturbances of the body? Are not the facts equally before us, and do we not daily evince in ourselves the incontrovertible truth, that the phenomena are equally under our observation? The operations which result from organization display the same certainty of contrivance and design, and corroborate that stupendous system of wisdom and intelligence which has been so satisfactorily demonstrated by Dr. Paley, in the structure of animal bodies.

142.—In the external world we every where see the wise and beneficent purposes to which all its laws are directed. We find the adaptation of means to ends every where to be traced, and these suited to the preservation and well-being of man and animals. Hence we may presume that the human body is equally adapted for the proper reception and use of those external agents; and that the organs of the body, and their respective functions, become responsive to these general circumstances.

143.—With this wise provision, however, we should be ever endangering the well-being of our bodies, did not nature wisely counteract the effects of noxious agents by powers inherent in the animal machine. These counteractions for the most part constitute the whole list of diseases.

144.—Admitting this effect, and this object, which, in the course of this inquiry, I purpose to demonstrate, it is clear that any means which merely tend to prevent or allay such salutary disturbance, must ultimately leave the constitution under the influence of those mischiefs which the natural powers were disposed to remove. The rejection of the noxious agent would not take place. Although we cannot always discover the causes against which the disturbances

of the stomach and bowels are destined to re-act, still it is but fair to conclude, that when the stomach and alimentary canal are thus affected, some determinate end is attempted by the natural powers, and that we should endeavour to discover wherein nature may be the most essentially assisted in these her salutary operations.

145.—A patient complains of feeling great uneasiness after eating ; of flatulence, acidity, nausea, and occasional vomitings; his bowels are uneasy, and the dejections uncertain, sometimes affected with diarrhæa, and often constipated. All such effects may arise from some noxious agents incautiously admitted into the stomach, as well as from other more common causes of stomach complaint, as a life of debauch, or a carelessness in not using exercise suited to the habit of body ; or in short many other causes, both of omission and commission. Should we be warranted in applying remedies under such circumstances, merely to allay those uncomfortable feelings, and to neglect the more obvious necessity of dislodging the noxious cause, or of preventing the natural powers from proceeding in their work of ameliorating the bad habit of body? After a debauch with excess of wine, the stomach is often distressingly affected—would a glass of brandy, which might ease the stomach, be a suitable remedy on that account?—would not such a plan tend to bring other organs into action, as the liver, and extend the causes of evil? It is this fallacious ease which urges the drunkard to the stronger liquors, and to purchase a deceptive comfort at the expense of his ultimate health and life.

146.—But whilst we admit these reasonings in regard to the above causes, it becomes a question how far stomach complaints are to be considered as arising generally from re-actions, necessarily and salutarily called forth for the removal of evils, or for the reparation of bad habits of body. If such should be found to be the case it will be easy to shew that a number of medicinal agents,universally recommended under such circumstances, are precisely similar to the glass of brandy after a debauch. A long list of medicines, under the title of stomachics, as bitters, ether, tinctures of various kinds, &c. falls, I conceive, under this reprehensible character.

147.—When a surgeon treats a wound, he trusts to the natural healing process, he removes out the way the causes of aggravation, and he solicits even painfully the

natural powers.—He would not think it necessary in any way to pervert those natural operations, which ultimately cure the wound. The same plan should be adopted in curing the stomach; the digestion in that organ is suited to the existing circumstances, and the duty of the physician is precisely here, what the surgeon's is in the other case.

148.—It must be admitted that the actions of the liver are regulated by the existing state of the stomach; and as this last-mentioned organ is subject to so great a variety of circumstances, the liver must be in a state of perpetual attention to the actions going on in the stomach.

149.—A bile suited to the digestion of the stomach is always necessary, and, therefore, whatever changes the stomach undergoes, the liver must have a corresponding change of action. As far as the natural object to be obtained goes, the bile as regularly proceeds in its functions as the sun rises and sets; alter the phenomena, and a new train of effects follow, wherein, more or less, or a differently constituted bile may be involved. This new series of phenomena may portend a quicker restoration of health, but every series, whether healthful or not, is obedient to laws, and is as regularly subjected to their controul as the planets in their orbits.

150.—But the stomach is for ever accused of interrupting our ease and comfort, when its powers are exerted to repel what we have incautiously placed in it, or to assist some distant organ under distress; thus, in any obstruction in the lower bowels, the stomach rejects every thing for the very obvious purpose of preventing greater mischief. For was the stomach to remain inattentive to the different affections of the lower bowels, insuperable accumulations would be suffered to take place, and entirely to stuff up and obstruct the lower passage. Thus, I shall have occasion to shew, that sickness, nausea, and many other stomach complaints, are often merely the symptoms of an inactive state of the lower bowels.

151.—We come now to another most important subject of medical inquiry, the consideration of purgatives. In a state of perfect health, we admit that the food is properly digested in the stomach, is forwarded in its progress through the alimentary canal, is taken into the system, or is rejected, and thrown out in an easy and quiet manner. After passing the stomach a proper bile meets it, certain

parts are duly assimilated, and the superfluous secretions and substances of the food, pass off through the general vent of the body. When the whole constitution of the body is in an healthful state, all the functions of the organs concerned in the digestive process conspire together to one point, namely, to the completion of healthful digestion. We will suppose under this state of perfect health, that some accident occurred to a distant part of the body; for instance, a leg may be broken; if this accident occur to the leg, all the bodily functions take alarm, and a new train of circumstances takes place through the whole constitution; a certain degree of fever may arise perhaps necessary to the healing process, in which fever, the stomach and alimentary organs must alter their plans, for under fever the same digestion must not take place. However, still supposing the body in a perfectly healthy state, except the injury, the alimentary functions will still conspire to just that object which the broken leg requires, such a fever as is necessary to the cure of the leg, and such a deviation from the usual processes of the alimentary functions, as prevents any improper introductions during the cure of the local injury. If any derangement therefore under such circumstances takes place in the progress of digestion, it must be salutary, it must be to assist in the ulterior object of curing the leg.

152.—Our first object in almost all extended diseases, is to excite the actions of the stomach and bowels, and thereby to recal that state, the defect of which has admitted the introduction of extended mischief. We excite the stomach, the liver, and the bowels, to throw off that accumulation which their powers, in the first instance, were too inert to repel, and by thus doing, we clear the constitution of the cause of evil. We must here mention that whether the disturbance takes place in the digestive organs, or in a more extended form in other distant parts of the constitution still these disturbances are re-active and curative. The balance of power is preserved through the whole frame, in the one case as well as the other. The sort of digestion, the quantity and quality of bile, and the degree of action of the bowels, generally preserve a due balance, quatenus the object aimed at by general or natural laws. Thus, when the gout supersedes the derangement of the digestive organs, their functions go on consistent with the gout; when the general balance involves any suppurative inflammation, the

stomach becomes obedient to the same general process; and whatever may be the affection which the laws regulating the animal frame bring about, as the result under any state of constitution, when uncontrouled by exterior interference, a general and regular balance obtains throughout the functions of every organ in the body. In our examination of the actions of the intestinal canal, we shall soon perceive that natural processes may be often safely and advantageously altered, that new arrangements and new balances may be brought about by medical means, involving less danger, and bringing about quicker relief, than by trusting to the arrangements which these powers would naturally produce.

153.—The disorders of the digestive organs have been reputed to be the causes of great and extended mischief over the whole constitution, and it is a very generally received opinion, that local diseases are to be attributed in all their aggravated forms to this disturbance in the alimentary process. To me the direct reverse seems the truth; the disturbances which take place among the digestive organs, tend to the alleviation and cure of distant morbid affections, and general and constitutional maladies arise in consequence of an inertness in the curative re-actions of those organs which are concerned in the alimentary process.

154.—If, for instance, an obstruction were to take place in the bowels; the natural re-active powers may not conspire to produce regular discharge through the obstructed canal, an inflammation often arises which might terminate in suppuration, and the offending cause may be expelled by this process through the surface of the body. Here the object of medicine must be to defeat this operation, to prevent the inflammation in the most speedy manner, and to urge the bowels into action by the most decisive measures. Although the suppurative process proves beneficial in some parts, in others it involves the life of the patient, and therefore an active recurrence to medicine is imperiously demanded. Worms in the bowels provoke the actions of distant organs, and thus we find that epileptic fits are often the result of such abdominal obstruction.—The convulsions of epilepsy occasion great depletion of the intestinal canal, but were we to trust to these natural efforts as the cure of the original cause, we might, and often should, endanger the safety of that im-

portant organ, the brain. The obvious treatment under such symptoms is to excite the action of the bowels, and thereby as quickly as possible dislodge the offending cause.

155.—We might suppose, that were our bodies preserved in a natural state, did we lead our lives exactly consistent with the intentions of nature, that these re-active powers might prove strictly salutary; but in refined society and under the various errors which obtain amongst mankind in their habits of life, it seldom occurs that natural laws are sufficient of themselves to contend with the evil. The functions of most of the organs become depraved, and most of the protecting intentions of nature are frustrated by the bad habits to which the frame of man is subjected. Many diseases wear themselves out and are quite eradicated by the powers of the body, where man is more in a state of nature, which prove fatal in vitiated society, when the constitution is affected by them, and is unaided by the powers of medicinal agents.

156.—Art may be said to regulate the great powers of nature in medicine as in other sciences; were it not for management, how fearful would be the operations of fire, of water, or of air. Nature is exuberant in the force of all her powers. Even in the laws which tend to repair injuries, we find the same extent of operation, and are continually obliged to restrain them. A true and just balance must obtain between an infinity of active causes when a real curative result is produced; and the art of the physician consists as much in the attempt to restore this healthful balance, as in assisting and encouraging nature in the performance of her own operations. Healthful digestion can only take place when a complete healthful sympathy and co-operation take place between all the organs concerned in the process. Thus, if the lower bowels should be obstructed, we find the stomach in a state of disorder, and whatever may affect the liver, alters the actions of all the other organs. These changes, a very little consideration will convince us, are necessary, and are salutarily exerted.

157.—It is well known that different parts of the organs of digestion are acted on by different purgatives, the stomach rejects ipecacuanha, whilst calomel and other materials excite the secretion from the liver; the large and the small intestines are also peculiarly affected by rhubarb, aloes, &c. It is to be supposed that the stomach's depart-

ment is to dislodge or to contend with the evils that might arise upon the admission into the body of a certain set of substances which excite vomiting, and that the liver is concerned in opposing the admission into the system of the poison of mercury. When this last mentioned mineral is however insidiously brought to bear upon the whole constitution, a much more extended re-action of the powers of the body is called forth, as will be seen hereafter. Mercury is offensive to the system, and the liver is generally excited by it to increase its secretion, and thereby to hasten its expulsion out of the body.

158.—As mercury thus excites the hepatic secretion, it becomes the means we often use to remove obstructions, as by such excitement the disordered barrier is compelled to give way, and thus all lodgments taking place in the bowels, as worms or other matters, are swept away by the secretion originally excited to remove the mercury.

159.—The liver therefore may not only be considered as an emunctory to clear out of the blood or general fluids of the body, refuse or improper matters, but as an organ destined to overlook and take care of the passing ingredients of the intestinal canal, and to assist in hastening the departure out of the body of offensive substances. The stomach may at once reject or may assist the succeeding organs in the further necessity of removing evil. Although we may not be sufficiently informed of the precise actions of the several organs in the digestive process, we yet may easily comprehend that they are all concerned in the above salutary purpose. Saline bodies, as the neutral salts, provoke the discharge of watery fluids, thus diluting and dissolving the salt, and by stimulating the bowels, removing it from the body. If we consider this point medically, we should observe that many substances pass the bowels without producing any general effect, although peculiarly stimulating to one particular point of the bowels; thus aloes affect the rectum, &c. If we wish to produce any effect, that is generally to relieve the several organs concerned in digestion, it is difficult to find any one substance for our purpose. It has frequently occurred to me to observe, that many people who have been in the habit of taking purgatives, as the Cheltenham waters, or other saline aperients for a considerable time, and who have had great daily discharges of watery evacuation, labour under all the symptoms of foul, and I may almost say, of obstructed

bowels; in such cases, a change of purgatives has dislodged a great load of fæces which had remained untouched by the former medicine. It might be almost said, that the efficacy, if felt from many purging waters, is as much to be attributed to the suspension of efficient purging, as to any real removal of the contents of the abdomen.

160.—It thus frequently happens, that patients whose bowels have been for a length of time daily subjected to the action of the strongest medicines, acquire by going to Cheltenham and other watering places, that pause and quietness, which recruit the diminished powers of the digestive organs. Saline purgatives, according to this conception, do not elicit the secretions generally as emunctories from the organs of digestion; and thus we find that such purgatives are not found to weaken the constitution, to the degree to which the more drastic reduce it. If a very large dose, we will say of calomel, be given, we find the effect to be a great discharge of bile; here again it often occurs, that the same satisfactory relief is not obtained as by a more moderate dose of medicine, particularly if medicines of different sorts be included; in the former, the bile is provoked by and against the calomel, which in this instance, is the poison against which the powers of the body re-act in a salutary manner. If, therefore, the fulness or the obstruction be not included in this effort to dislodge the calomel, there is no relief obtained by its removal.

161.—If in healthful digestion, just that degree of stimulus be necessary, as is supplied by the food, to preserve a due action through all the organs concerned in the process, it does not follow that in every defect of that stimulus, the organs should be roused into the highest degree of action. It may only require the gentlest assistance to bring forward the natural powers to act properly. Besides, with small doses of mild purgatives, we often acquire a greater concurrence of natural powers to the production of this salutary effect, than when we urge and rouse the greater re-actions against a severe and intense drastic agent. It is far better to solicit, rather than to urge the natural actions of the several organs concerned in digestion, and thus we find that medicines which include a variety of substances, affecting the different organs in digestion, produce a more satisfactory and salutary effect than any overdose of the strongest medicine.

162.—Upon this principle, we may say, that when liquid and very watery stools are obtained by medicine, we seldom observe that satisfactory relief, which is the consequence of milder remedies, where large and foul dejections come away. From the immense quantities of foul and solid substances that are discharged in some cases where the ingesta form but a very slight proportion, we may infer, that a large part of such discharge arises from the secretions of the organs, particularly of the liver.

163.—This would seem to show that the liver throws off, as a great emunctory of the body, a great cause of disorder; and thus it is of importance to bring about this function of the liver, whenever we seek for relief by purgative medicine. If the action of this organ be called forth by the most active medicine, and if that action be provoked by the medicine for the purpose of removing it from the body, the gentler action of the liver as an emunctory is superseded, and the effect on the constitution is generally but trifling; an exhaustion from over-action only is felt, and only watery stools are produced. But if we quietly assist natural powers, stimulate only to the point where heavy evacuations succeed, a real and permanent advantage and relief are felt over the whole frame.

164.—It is not by removing whatever may at any time exist in the intestinal canal, that a purgative effect relieves the constitution; as far as uneasiness may be felt by such accumulations, so far relief may be obtained; but a complete and decided advantage from aperient medicine, comprehends the removal out of the system of the secretions from the organs of digestion, as emunctories of the whole constitution.

165.—Thus, if the liver pours forth as an emunctory from the blood an altered bile, great and heavy and foul evacuations ensue; and thus we find, when such an effort of constitution, either spontaneously arising or produced by medicine, takes place, that a great curative effect is perceived. Thus we would rather endeavour to solicit this salutary action of the emunctories, than call forth, by violently active medicine, the mere mucous and liquid discharge. Patients feel satisfactory relief from the one, whilst from the other there always remains the feeling of an undischarged state of the bowels. I question much whether most constitutional diseases would not, in some stage or another, be salutarily influenced by a real and

efficient clearance of the emunctories, by this mode of purging.

166.—We find that disorders arise over the general frame after a long course of full living—we know that natural effects take place occasionally, throwing off by bilious discharges and diarrhæas much of the evil; still, however, after a length of time, these functions of the organs of digestion become inactive, and accumulations of ill invade the whole system.—A necessity now arises for greater and more extended re-action of the system, and diseases of an afflicting character infest the body. Thus gout, and a variety of other diseases arise. The gout does the work which is left unfinished by the re-active energies of the digestive organs, and as far as its curative powers go, produces a salutary outlet for the accumulated evils. The gouty diathesis alternates with the functions of the intestinal organs, and is with them reciprocally remedial.

167.—Skin complaints are, also, in the same manner, often to be traced to the defective state of the digestive organs, and are likewise a more extended natural mode by which nature averts and throws off the disease.

168.—It would lead us into a very wide field of inquiry, to trace, in detail, all the modes by which the several parts of the body sympathize and associate for the purpose of producing a curative re-action. But we may say, that the disordered action of the stomach and bowels prevents the necessity of extended disease, and is, in fact, not the cause, but the cure of constitutional maladies. We nauseate and disturb them by medicine for the purpose of cure, and by doing so we recal, out of the constitution, those causes which, by their accumulation, provoke into action the severer constitutional disease. We attempt to make the stomach and bowels do their own work, and thereby to throw off from the body by their emunctories, these causes of mischief. It is a subject of almost daily surprise amongst medical men, how the body could contain such a mass of heavy and foul matter as appears in the evacuations of a great portion of patients, and how trifling is the quantity produced in some of the most desperate maladies.

169.—When the organs of digestion act really as emunctories, the production of feculent matters is immense; but when other curative and more extended reactions take place, this salutary work is done in another

manner, wherein are not necessarily involved the re-active efforts of the liver or the other organs. Thus when we can by medicine induce the stomach, liver, &c. to do their own curative work, we find such evacuations as quickly convince us of a speedy cure.—Thus in children, we attribute to foulness of bowels a large proportion of complaints, and we speedily aim our means to the removal of these foul secretions of the emunctories.—Here the stomach complaints and foulness of bowels are the cure, and we keep up or increase them for that salutary purpose.

170.—When purging therefore is unattended by foul and heavy stools, we question its salutariness, and we remove the appearance of paradox, that costiveness takes place when the bowels are frequently urged to discharge thin and watery stools.

171.—Sufficient has now been said to show that efficient purging is to be estimated, not by the frequency of dejection, so much as by the nature and properties of the substance evacuated, and that one discharge of heavy feculence, gives more relief than any number of thin and watery stools. A bad habit of body may be supposed to arise from a defective power in the re-active energies of the digestive organs; it seems owing to this cause that an idiosyncrasy obtains in different individuals; a proneness to receive the impression of external morbid causes, varying in its extent in different people. Thus we find, that in gouty habits almost any external morbid cause provokes the gout; in other habits, rheumatism, coughs, and inflammations of various kinds. Certain accumulations which the organs of digestion have suffered to pass on into the constitution, are ready to rush forth agreeably to the balance that exists between the several powers of the body, and according to the excitement produced by the external cause. Thus, when a number of people are exposed to the same morbid agent, each may be, and often is affected differently. What produces a catarrh in one, may elicit gout in another, and consumption may be brought forward, or fever, rheumatism, or any other disease to which the habit of body may be predisposed. At different periods of life, a different predisposition shews itself; and thus we find that in medical language, the same exciting cause will produce effects agreeably to the inherent predisposition of the body.

172.—It appears clearly that such predispositions are

often attributable to circumstances affecting the constitution in early life. A costive habit of body unattended to, becomes the source of great mischief; even the excitement of the bowels by strong and active medicine, such as by the abuse of mercury, will predispose the constitution to the invasion of morbid causes in later life. Errors of diet, want of suitable exercise, confinement from the open air, exposure to foul air, &c. all conspire to render the curative re-active powers of nature defective in their salutary operation of guarding the constitution from the incursion of morbid causes. Thus the swoln bellies of children, and the scrofulous diathesis of those who are pent up in populous towns, and the defective sanguification of those who, in the country, are exposed to errors of living and of diet. "*Venienti occurrite Morbo.*" It is to these early states of constitution that our attention should be directed, in order that we may avert the evils of later life; and a healthy population depends more on the care which is bestowed on children than on any other attention in later life.

173.—In so variable a climate as this, the provocatives to consumption are always occurring; wherever the predisposition is strong, there is almost a certainty of exciting causes; if therefore a bad habit of body lead to this predisposition, an early attention to the digestive functions of children must be of the utmost importance. It seems therefore necessary to keep up the natural re-actions to their full powers, and thus to prevent the constitution from becoming loaded and oppressed.

174.—As an erroneous estimate is often made of the salutary efforts of nature, it will be often necessary, in this inquiry, to point out many causes which tend to the production of predisposing taint; thus diarrhæas which come on children, are perpetually checked under the idea of removing a disease, when that diarrhæa is generally in itself a curative operation. It is often the symptom of loaded bowels, and will often prevent the higher re-active operations which supervene, such as epilepsy and other extended maladies. Diseases often conspire to produce a curative result; they are often converted one into the other, or succeed one another by laws evidently to the benefit of the patient.

175.—It seems pretty obvious that diseases act as emunctories, and that they occur when a determinate

balance between the several powers of the body takes place. If the functions of the alimentary canal go on, regardless of the introduction of noxious substances, if their powers are weakened or their operations counteracted, the necessity will arise for more extended re-actions over the system. Thus, after a long course of improper diet, not well digested from inactivity of life, want of exercise, and free air, much cause of mischief accumulates. This accumulation, after a time, excites a re-action in the organs of digestion, a copious flow of bile takes place, the stomach becomes nauseated, and the bowels discharge their secretions in a violent and painful manner. Such vomiting and diarrhæa prove so far curative, that they are at last roused into an action which removes and carries off the accumulated cause of mischief. This operation of nature we now only consider as obviating the mere foulness of bowels: we shall hereafter consider such bilious attacks under a much more extended point of view.

176.—If such efforts as these occur whenever the bowels are loaded, and if they are adequate to the removal of such offending cause, and if by such increased action the healthful powers of the body are not exhausted, this altogether must be considered as salutary. It must prevent further extended mischief, or the further necessity of the more extended re-actions of the system taking place. But by these exertions the alimentary powers are exhausted, they become by long trials inadequate to perform this resisting process, evil accumulates in the general constitution, and extended re-actions become necessary to preserve the safety of the body. When such mischief has got a footing in the constitution, and has passed the organs, which in a healthy state are destined to guard against its entrance, new re-actions of a more extended character are called forth, and constitutional diseases of various kinds are excited. When these greater operations are become necessary to the safety of the body, we often find that the digestive organs are relieved, that the weight of exertion is removed from them, and the cure will often take place without their interference. Thus, after a long bad state of the digestive organs, a fit of the gout will throw off the burthen that seemed to oppress them, and will often by even a trifling inflammation of the joint, remove causes of very great extent, when affecting these (as they may be called primary organs. In this way we find, that a little constitutional ailment will promote a greater re-active ef-

fect, than a very great disturbance of the digestive organs. The curative effect seems greater, the more it is extended; and a great degree of stomach complaint is equal in curative effect to a small portion of gout. To make the stomach and bowels do the work that gout does, we must make them work very hard; and it is thus that medicines which very intensely disorder the stomach and bowels, do sometimes relieve the inflammatory effort of gout, and recal the necessity altogether of such extended re-action of the constitutional powers.

177.—We find that those people who are most liable to stomach complaints are frequently the least afflicted with constitutional disease; for the re-actions of the stomach and bowels prevent the admission of the causes producing them.—Those also who are liable to constitutional maladies, are frequently free from any great disturbance of the organs of digestion.—Causes however often exist which provoke the action altogether, and therefore it may sometimes be difficult to trace precisely these alternations. Stomach complaints may be generally traced as curative, and the powers of medicine are generally applied to excite the re-actions of the digestive organs. Thus emetics, purgatives, and other disordering means applied to the stomach and bowels, prove serviceable in arresting the tumult of constitutional disturbance. A bad habit of body, a cachectic state of constitution, is thus often removed by a steady attention in duly provoking into action the re-active powers of the digestive organs; and thus do we find that those states of constitution in which extensive general maladies arise, are such as do not occur where the organs of digestion have been in the habit of disturbance and re-action.

178.—Under this view of the subject, the disorder of the organs of digestion cannot be looked upon as the cause, but the cure of constitutional disease. The necessity for re-action exists; and if the stomach and bowels can effectually contend with the evil, and conquer it, the more extended disturbance becomes unnecessary. People very prone to gout, are seldom much afflicted in the stomach; the disorder occurs at once, being quickly excited, and the intermediate disturbances do not take place. When the gout hesitates to come on, the disturbance of the stomach and bowels is very great. In such states of erratic gout, medicine recommends stimulants and cordials

which appease the organs of digestion, and the gout shews itself. The converse of the above observation seems also true, that in a fit of the gout, if you intensely disorder the digestive functions by violent emetics, purgatives, eau medicinale, &c. the gout disappears from the joints.

179.—What applies to gout is equally applicable to other disorders, though varying according to the causes that produce them, and the constitutional arrangement of powers excited to remove them. Certain causes produce gout; that is, such causes produce the re-actions of the system constituting this natural mode of relief. If a person exceeds in eating, and uses but little exercise, drinks no ardent spirit, but indulges in the weaker fermented liquors, far different re-actions take place in his system, than those called forth by the dram drinkers.—The one may be subject to gout, the other to great disorder of the liver. Thus, some medicines excite the action of one organ, other medicines of another organ. One function in this case is, what nature compels to resist the action of one cause, and another train of re-actions are required to expel another agent out of the body. Thus we find that the secretion of bile is augmented or so far altered by calomel, as to excite an expulsory effect on the bowels. Other medicines are left to the natural effort of other organs, which in a healthful state of body succeeds in the object of either removing it or obviating its effects. Thus salts are diluted by general secretions from the mucous glands, &c. &c.

180.—If these primary re-active measures are ineffectual, the mischief extends in the constitution, and thus mercury, for example, will produce when thus introduced, far greater and more extended effects. Thus antimony will be obviated by perspiration, whilst mercury will excite the salivary glands. In the first instance they irritate different organs, and when farther introduced, provoke different constitutional re-actions. Medicines in this way may be compared to the causes of disease, as they are capable of producing either the disturbance of the digestive organs, or the farther constitutional tumults.

181.—It cannot be doubted but that distant organs conspire to produce a curative local effect; thus foulness of bowels, as worms and other obstructions, are often removed by epileptic fits.—Here the epileptic affection of the brain becomes subservient to a remote necessity. If

previous to this severe re-active operation of nature, a medicine had been given to excite the local powers to the point necessary to remove the obstruction, the extended operation of nature, the epilepsy would not have been necessary, and the fit would have been prevented.

182.—In like manner all great local disorders, as abscesses, &c. which as emunctories, ultimately bring about a healthful balance of constitution, may be superseded, and often perfectly prevented, by rousing the re active powers of the digestive organs.

183.—But the powers of the digestive organs have their limits, and we shall proceed to state a variety of complaints wherein these organs cannot be depended on for a perfect cure. If the digestive organs of children be much loaded and oppressed, and the natural re-active powers of those organs are inadequate to the removal of the obstructing cause, we often find an accumulation of blood takes place in the head.—This may produce epilepsy, inflammation ending in effusion, or various other diseases, the known result of such determination. If any cause produce a loitering in the returning blood through the vena portarum, or any retardation in the lower circulation, this retarded blood, whilst the heart acts uniformly, will become a kind of fulcrum to the general circulation, and more blood will necessarily flow towards the head ;—thus, the very evil of obstructed bowels by pressing on the vessels of the returning blood, promotes those extended re-active powers proceeding from the head, which often prove curative of the original complaint. But these extended re-actions are themselves often subject to great varieties, and healthful results are not always produced by them; —thus the fulness of blood in the head may bring on other diseases besides those which may be more strictly curative. The fulness may produce inflammation, and inflammation may precede that effusion which brings on all the symptoms of hydrocephalus.

184.—The art of medicine, therefore, consists as much in regulating the operations of nature, as in removing and altering the plans she may adopt. An increased flow of blood to the head may be necessary under certain diseases of the digestive organs, and where those organs are obstructed, in order to give that supply of nervous activity requisite for the curative operation. If such a flow exceeds its limits, other effects follow, all perhaps to be

traced to a curative result, but unquestionably endangering the constitution to an extraordinary degree. Phrenitis, apoplexy, epilepsy, and hydrocephalus, hysteria, and most probably the whole train of nervous diseases, will be shewn to arise from different degrees of the same general principle, namely, the constitutional re-active power of causing what, under some circumstances, must be considered as a healthful determination of blood to the head.

185.—The human body is so altered by refinement, so disguised by unnatural dissipation, that nature is changed in almost all her re-active exertions. She is driven to her last efforts by causes which in a more natural subject would be repelled by her least powers, and the balance of the whole constitution to produce a beneficial result, must often, under such a state of things, involve the farthest and more remote co-operation. If the stomach be alive to its own character, has not been cheated into a false security, by being pampered with vicious indulgencies, it would reject or contend with every evil that may be introduced into it. The child at the mother's breast, rejects the crudities, and discharges from its tender organs the causes of evil. If the stomach rejected all hurtful aliment, and disdained its over repletion, we should have but little cause to complain of these things as evils.—But if we coax the stomach to keep in what naturally would be thrown out, if we lull those re-actions which nature intended should be exerted, we keep in our bodies those causes of evils against which nature had evidently implanted a provision. If then these evils be not removed from the stomach, some other re-active powers of the body must be required to further the orignal plan of removal, and thus the re-active powers of the liver, and the whole digestive organs, become disturbed for the same ulterior purpose, viz. the removal from the constitution of the original cause.

186.—To this simple proposition do I refer all the disordered appearances of the human body, and by means of it do I hope, satisfactorily, to unravel some of the apparently mysterious application of disease. If the stomach do not reject a noxious agent, and do not so manage it that it shall be dislodged by a suitable bile (for the action of the liver, in the secretion of the bile, must be regulated by information by nerves, &c. sent to it from the stomach) if, I say, the stomach does not dislodge it, or the digestive

organs remove it out of the system, it must by its presence provoke other re-actions, and be the cause of the exertion of higher re-actions and of more extended disturbance over the system.

187.—At this point, where the powers of the stomach and digestive organs are inadequate to the removal of the evil, we may say, in a medical view, that medicines which increase their re-active energies are here applicable. Thus small doses of ipecacuanha, aloes, or any mild and gentle aperient, by soliciting the powers of the stomach and digestive organs, prove admirably serviceable in a healthy state: that is, the stomach is brought to act naturally, and the digestive organs repel the evil, by this artificial assistance given to their dormant re-active powers. But how often do we see, and if this view of the subject be correct, how often must we deplore the introduction of cordials, of bitters, and of opium—still further restraining those salutary operations implanted by nature in the organs concerned.

188.—Another very important medical consideration occurs here. It does not follow that because the stomach does not act, or the digestive organs generally are not fully excited, that there is a total loss of power, and that they are wholly incapable of re-acting. It generally requires the aid of only a small additional power to bring them into full activity; and thus it is daily observed, that small doses of medicine, under these circumstances, will often produce more satisfactory and beneficial relief, than the stronger and more drastic purges. So whilst we deplore on the one hand the omission of not assisting these natural powers, we cannot help deprecating on the other hand the use of so much mercury, antimony, and other violent means.

189.—It would be contrary to experience, and certainly not consistent with this view of the subject, to suppose a definite state in the process of digestion. Every thing done in any one part of the human body is dependant upon a balance subsisting amongst the whole; so that the digestion that is at any one time performed in the stomach must be referrible to the existing circumstances of the whole constitution. A digestion must even with the same quality and quantity of aliment be dependant upon the foregoing exercise of the body, upon the state of either mental or corporeal exhaustion; in short, the state

of digestion must be suited to the general state of the body. If therefore the digestion vary in this manner, the action of the liver must vary, and the sort or quantity of bile must be regulated according to the preparatory process in the stomach. How cautious therefore ought we to be in unnecessarily interfering with and regulating these operations!—Thus are these organs continually roused into an action violent as the agent used, mercury—and the liver and other organs calumniated for vices and crimes whilst performing their strictest duties and rigidly adhering to the stupendous designs of the Creator of our existence.

190.—I have already explained how contrary it is to sound philosophy to conceive that so important an organ as the liver,should be so often,as it is reputed by modern medicine, in error. That there should be so frequent a change from natural operation in it, that almost every malady should be declared to be from the bile being too much or too little in quantity, and that its quality should be so often egregiously improper.—These changes in the action of the liver I have attempted already to shew, are necessary to the removal of evils which would produce greater disturbance, and which are naturally produced according to the circumstances required by the human constitution at the time.

191.—It is for instance an advancement towards recovery,when the liver pours forth what has been erroneously supposed to be vitiated bile; it is by pouring out this sort of bile that the liver unloads the constitution of evil. It is a remedy of nature by this bile; by this emunctorial discharge she removes from the habit what would otherwise provoke higher re-actions, apoplexies, and other cerebral affections and disturbances. It is by correcting this sort of emunctorial discharge, that modern medical practice so often keeps in the causes of constitutional disturbance, and gives by its abuse of mercury such a formidable predisposition to glandular, scorbutic, and a long list of seriously bad habits of body. As long as the stomach, liver, and the digestive organs, generally, can properly prepare the food, by digestion, for the real use and service of the body—as long as they are alive to the impression of noxious agents, and repel their making way into the constitution—as long as what is called dyspepsia or indigestion can avert and correct the ill effects, which, without such managed and altered action, must arise from over reple-

tion, or the introduction of improper food, or liquids, the constitution generally is but triflingly injured or impaired. But if these primary organs do not suit their actions to these causes, if they are lulled in their actions, baffled in their natural purposes, or stimulated in any other direction, by improperly applied remedies, the evil passes on in the habit, and re-actions of an higher order are necessarily provoked to do that work of correction, which the digestive organs have thus left unfinished.

192.—Thus the constitutional disease, gout, is a salutary and re-active process of the second class. An inflammation attacks the extremities, which inflammation gives increased activity to the vessels farthest distant from the heart, and is, as it were, a subsidiary and assistant heart, helping and aiding its primary in the performance of its high and constitutional functions. Certain evils are thus met by a correspondent effort of the frame. If the stomach and digestive organs are in gout violently excited to react, as by drastics of any kind, then this arrangement of nature is not necessary, the inflammation leaves the foot, and the digestive organs correct the evil. If the digestive organs are too much actively concerned, then quieters and corroborants make them peaceable, and the business is done as before, by the inflammation excited in the extremities.

193.—If the digestive organs have too much to contend with, and are incapable of resisting the accumulation of evils which invade the constitution, the re-active power of the second class may be necessary and useful to the frame. Thus gout may be, and often is, a safe landing place on which physicians may depend, in counteracting the evils which have accumulated in the constitution.—Thus it is, generally, a most fatally conceived opinion, that eau medicinale and drastics should be recommended for the cure of gout. It is well, however, if we can bring back the constitution, to throw off by gout, what has passed farther on into the constitution, such as cerebral affections, and their consequences, palsy, &c.

194.—Having already given the general outline of the view I take of the human constitution, in its disturbed as well as more quiet actions, I shall proceed to examine more in detail this interesting subject. It appears to apply, wherever I have had an opportunity of observation, and seems to me to hold good under all the bodily and mental

actions that take place in health as well as disease. I would not indulge the preposterous hope that I could unravel the science of the human body; but I would, without fear, use every endeavour within my power to make the healing art approach, as near as I could, to something like the dignity of a science.

195.—If the heart (I mention the heart only to instance some important organ)—if the heart has more to do than its powers will admit, either additional strength should be given to that organ, or some of its work must be not completed. In examining this subject it is every where beautifully contrived and designed, that the defalcation of power should obtain, under the most rigidly protecting laws.

196.—If for a time the mind be suspended, the additional strength acquired by the heart not being called upon in that direction, enables the whole frame to endure convulsions, which violently repel evils that milder plans would not touch, and bring about such a restoration as in time allows the mind to reassume its seat of empire, and again to enjoy its usual rank in the constitution. Did epilepsy, for instance, occur in a perfectly natural subject, as for instance, in infants from crudities, &c. it would be, and is permanently curative. But by vitiated habits of life, even the corrective re-actions, as well as the healthful powers, are so much altered by refinement, &c. that they are disturbed in these their salutary operations.

197.—It has been proved by eminent practitioners, that palsy, or to speak more correctly, apoplexy, is a process of the constitution, not depending in ordinary cases on the rupture of a blood vessel, simply occasioned in a mechanical manner. It arises from an oozing of blood from many orifices, and the blood is effused into a part of the brain, which shews all around marks of a natural process. Thus, as an abscess is formed by a given natural determination, so is apoplexy another effort of nature; an effort for wise purposes, and involving still the same question of its being intended, by taking off some powers of the frame, to enable life still to go on.

198.—If certain powers be suspended on one side of the body, the life of the patient does not cease. It is here supposed that were not these powers sacrificed, death would necessarily take place. That, if delirium, mania,

and all diseases of the kind did not happen, the powers of the human frame would be inadequate to the demand upon them, and that they would cease by exhaustion.

199.—Here a very serions question may occur—how can any one presume to interfere, if all these diseases be curative? How can we dare to approach powers so beneficiently applied, and so clearly the resources of nature? The answer is obvious and easy. Nothing can be more detrimental to the real science of medicine, than the expectant system. It precludes all human exertion, and puts a stop to all philosophic inquiry. With these opinions, and this view of the subject, the importance of human aid is more than ever necessary.

200.—Nature acts more by general than by particular laws; she is exuberant in her provisions against evils. If a tree be wounded by the poison of the smallest insect, an immense new growth is occasioned to heal the wound. If the bowels be obstructed in the human subject, nature raises an inflammation of the bowels, and proceeds by the process of suppuration and abscess, to carry out the contained matters to the nearest surface. The physician bleeds his patient to deliquium, to avert this effort of nature, and excites the stomach and bowels to dislodge the offending cause in an ordinary manner. If threatenings of apoplexy and palsy were to arise, physicians would attempt to recal the lost re-active powers of the primary organs; would retrace the steps by which the evil had advanced; and would defeat by local and general depletion, the threatened exertion of the newly-arisen re-action. Although these diseases may occasion death, or although they are so far extended beyond the exigencies of the case, yet are they to be traced as compromising and curative, and often the only resource to which nature could apply.

201.—In order that I may elucidate this view of the diseases incident to the human frame, I must make use of supposititious circumstances, which may not appear to be, and in fact are not founded upon strict physiological or pathological principles. The truth of a real inquiry may be often ascertained and deduced by a fictitious arrangement. In natural philosophy and physics, generally, we presume upon principles which can never be accurately proved; and we demonstrate propositions by data, that in fact are too nice to be absolutely cognizable by our external senses. But in this inquiry, I intend only to follow

a presumable course of investigation, which in all its circumstances may never really happen.

202.—We will suppose some offensive, noxious, poisonous substance introduced into the human stomach. If such sickness be excited that it be wholly removed by vomiting, all danger of further harm is over, and the reaction of the stomach is salutary, and the disordered state of the organ is curative. If to induce this vomiting it be necessary for the stomach to be aided and assisted; if a greater supply of nervous power be required, and the brain, or heart, be sympathetically excited to help the stomach, these actions, when the evil is removed, may be supposed to return to their original state of quietness and repose. The evil may not incommode the stomach, or this organ may be too inactive to notice it when introduced, and when passing; supposing it still offensive to the constitution generally, some other organ must re-act against it, and the effect of removal must be produced in some other way. Thus, as it proceeds in the digestive process, the liver may be called upon to exert its powers to this ulterior purpose. Calomel, for instance, is not very offensive to the stomach; but the bile is roused to remove it through the bowels. Should this substance however be insidiously introduced, its poisonous qualities are counteracted by higher and deeper operations of the system. I need not dwell long on this part of the subject; I have already traced many of the causes which provoke the energies of the digestive organs, and have also shewn the reasons why I consider these disturbances salutary in their character, and curative in their final results upon the constitution. It would be easy also to shew how, at every step in these processes there is a wonderful co-operation in the varied actions of the heart and brain, and what a wonderful balance obtains through the system whenever every, the smallest effect is produced. This however, would lead me too far into the consideration of the structure of the human frame, and into the description of the nervous connections and sympathy which exist throughout. Were it necessary to the elucidation of the subject, it would not be difficult to develope in detail the wonderful adaptation of the human frame to this end, and to shew the real connection and disposition of organs, vessels, nerves, &c. for completing these salutary purposes.

203.—We now proceed to inquire what would take

place were the stomach, liver, and digestive organs, generally inattentive to the passing contents of the alimentary canal. The offensive matter originally supposed may pass on into the general constitution, and may provoke re-actions of a higher order, still necessary to its ulterior removal. It is even known, that the evil may proceed into the constitution in defiance of every effort and re-action of the stomach and the digestive organs. In such a case, we have to contend with the exhaustion occasioned by the ineffectual over-action of these organs, as well as the noxious matter, the original subject of the above supposition. When, therefore, these causes operate upon the general constitution, great derangement occurs throughout the frame; disturbances of various kinds take place, all arising from salutary and re-active operations, tending, as those in the stomach and bowels, to remove the evil introduced, and are re-active efforts to expel the evil on its advance into the general habit of the body. I have already explained the phenomena attending gout, and the curative re-action of which it consists. Should these exertions of the constitution induce a state of exhaustion, then, either artificial strength must be induced, as in various fevers, for the purpose of removal, wherein a temporary excitement may bring up the natural powers to a pitch equal to the contest, or some power of the body must be sacrificed to allow the remaining parts of the frame to become equal to the task; either palsy, wherein there is a delinquency of power, and consequently a diminished demand upon the heart; or, there may occur a temporary suspension of the active and reasonable mind, allowing thereby, an additional strength to powers of the body for the purpose, as in sleep, of general reparation; or the particular necessity then existing of forcibly removing from the system the noxious, offensive, or poisonous matter originally supposed.

204.—The reasonable mind is suspended in epilepsy, and the powers of the body assume a character of strength in the convulsions attending it, as forcibly to expel worms, or other accumulations from the bowels, &c. In hysteria also the phenomena bear a great resemblance to the former.

205.—Thus opium, by unsettling the reasonable mind, acts as a strengthener, and allays morbid irritations in various parts of the body.

206.—It requires but little consideration in tracing the

phenomena of disease to apply the foregoing principles, and by their means to explain the course, under this view of the subject, which nature follows in many of her most disturbed operations. The re-actions of the stomach and the digestive organs are necessary, in almost all the most extended diseases of the human frame ; for whether the evil be introduced into the stomach, or be admitted by the lungs, skin, blood-vessels, or absorbents, still it must be generally through the operations of the digestive organs that it be carried off from the body.

207.—Many however are the resources which nature has besides; pustular inflammation, desquammations of the skin, mental delinquencies of all kinds, epilepsies, palsies, and the whole list of nervous disorders, may throw off various causes of evil from the constitution, or produce a balanced state of body consistent with life. But all these disorders are acted on, and often rendered unnecessary, when the stomach, liver, and digestive organs can be excited to a due performance of their duties, in the emunctorial properties they possess of unburthening the system of the admitted offensive causes.

208.—Thus does mercury so far excite the digestive process, that the higher disturbances occasioned by the introduction of the venereal virus, give way to its use ; and thus is it found that phagedenic ulcers, which resist all attempts of the healing art, become tractable as soon as the stomach and digestive organs are roused into action. From this principle also, the admitted use of nauseating and purgative plans of cure is explained, as regards the treatment of mental, cerebral, nervous, and indeed of almost the whole catalogue of constitutional maladies.

209.—I would here explain, according to the foregoing principles, why mercury tends to free the constitution of a virus, with which the constitutional powers alone are unable to contend. There are two modes by which this poison, mercury, is carried out of the human body; or, perhaps, more properly speaking, by which the body is freed from any fatal effects when it has been introduced. If a large quantity of this mineral be taken, the effect is immediate; the bowels are excited, and it is carried off by stool. If, however, it be carried into the general system, a more extended constitutional re-action takes place, and this re-action shews itself in the digestive organs by the peculiar white tongue, derangement in the digestive organs, and

by the extraordinary affection constituting ptyalism. If the virus of syphilis did excite these digestive disturbances, I conceive, that the disorders which are now resulting from it would never have arisen, and that the constitution would free itself of the poison in that manner. As the case now stands, mercury is used as a means to excite that constitutional relief through the digestive organs, by which not only the mercury, but other poisons which are present, are carried towards, and eventually got rid of, by the emunctorial powers of the great secreting viscera concerned in the digestive process.

210.—Every medical practitioner is aware that the tongue assumes various appearances on its surface, under different disorders affecting the human system; and I believe that the generality of physicians are inclined to acknowledge the fact, by admitting that the tongue is an index to the state of the stomach; but the inquiry which naturally arises in one's mind, on the observance of such an appearance, consists in the following questions:—From whence should originate such a state of the stomach and of the tongue?—And for what purpose can nature have effected such a change, even where organs remotely situated might have been affected?—It will be my object to reply to the questions which I have proposed, by attempting, in the first instance, to investigate the causes of the white or furred tongue; and by endeavouring, in the second place, to ascertain the beneficial results which obtain on the accession of a change so generally observed. For the purpose of conducting my first inquiries, it will be requisite that I should examine a case in which the affection of the stomach is frequently induced, and in which instance the whiteness of the tongue is particularly conspicuous. Let us therefore regard with attention those symptoms which are attached to the state of an epicure, or of those who may occasionally partake too liberally of wine or other stimulating liquors; in either instance it will be observed, that where the constitution be good, where there is remaining an energy adequate to the production of reaction, the almost certain consequence of an unlimited indulgence at the festive board, is the occurrence of a reaction at the stomach; a circumstance which is marked by a loss of appetite, by eructations, by the surface of the tongue being covered with a white secretion, and by nausea.

211.—To determine the cause, which is productive of this re-action of the stomach, it will be necessary that we should advert to the primary derangement of the constitution, which will be found to consist of an accelerated circulation of blood, effected through the influence of stimulating food or inebriating liquors increasing the action of the heart. The excited action of the heart must of course determine blood with unusual celerity through the various organs of the body; and in those situations where the arterial vessels are possessed of less tenacity than others, they not unfrequently yield in different degrees to an increased momentum of blood, producing a state which may be denominated with propriety a state of sub-inflammation. From the circumstance of the vessels of the brain partaking less of tone than other arteries, it may be readily inferred, that in this situation they would be more easily acted on, notwithstanding the beautiful arrangement which has been displayed by nature with regard to the manner in which the internal carotid arteries are disposed; in short, the vessels of the brain are particularly susceptible of such a change from an increased velocity of blood through them, a fact which is strikingly exemplified in the instance of a man under the delirious state of intoxication, a state indeed which I would be inclined to designate by the term subphrenitis; not however but that it sometimes exceeds that degree by constituting phrenitis, and even ascends higher still by producing apoplexy. After a lapse of time, generally depending on the power and duration of the exciting cause, the action of the heart becomes retarded, even to a degree less than it was previously to its having been so stimulated, and then it is that we observe the re-action of the stomach, or of the bowels, consisting of an increased determination of blood to their surface, by which means a peculiar secretion takes place, producing in the stomach and tongue those symptoms which I have described, and from the bowels feculent and efficient evacuations. Having then traced these several phenomena, I believe I am right in replying to the question which I first proposed, by saying, that the state of the stomach arises from re-action, which by inducing a change of action in the secerning vessels of its villous coat, excites them to deposit a peculiar secretion adapted to the nature and extent of the injury sustained by the constitution.

212.—I have next to attempt the rendering a solution to the second question, namely, as to what are the benefits

resulting to the constitution by a re-action of the stomach or bowels? This task I shall enter upon with a considerable degree of pleasure, not only from the circumstance of my being enabled to reply to it, in a manner which I conceive founded on reason; but from its developing a new and extensive principle in pathology, replete with the most beautiful and varied views of the salutary functions, which are incessantly occurring in the animal economy. I do not hesitate in giving it as my opinion, that in those instances, where the action of the heart is become considerably accelerated, either through those means which I have related, or by a variety of other causes, that such an effect might in all probability be sustained for a considerable period; or even augmented to so great an extent, as to endanger by inflammation the destruction of organs essential to vitality, were it not for the supervention of those symptoms which characterize a re-action of the stomach or bowels, by which circumstance the action of the heart becomes impeded and controuled, and is rendered to a certain extent subservient to the salutary re-action of the stomach. I may inquire whether there exists one of the profession, who will not readily admit that this state of the stomach is capable of controuling an excitement in the action of the heart? If there be one, I would ask, whether in the treatment of active inflammations, we do not avail ourselves of this power, so clearly pointed out to us by nature, by administering to our patient those nauseating medicines, which are calculated to sustain such a salutary re-action. In proportion as we increase the number of our facts appertaining to the science of medicine, the more satisfactorily is developed the truth of the principle, that re-actions of the stomach and bowels are the natural means which are uniformly had recourse to for the removal of all diseases, not even excepting those which are denominated organic.

213.—When, however, I say that these are the natural means, I would wish it to be understood, that I am far from conceiving that this effort, consisting in the aforementioned re-action, is at all times competent to effect the object which is held in view. As is the case in all the other operations of nature (not confining myself to those, which in the natural order of things are to be observed, as accruing to animal bodies), so it occurs in respect to the instance now under consideration, that the powers of nature are at one time exceeding the extent

which is required, or in other words, are the means disproportioned to the effect, and at another time, are they to be observed, as from their deficiency of force, to be inadequate to the accomplishment of that great object, comprized in the endeavour to restore the natural tenacity of parts, and to bring about a healthful state of the constitution.

214.—ALTHOUGH I have presumed so far to generalize, as to refer the numerous salutary efforts of the constitution to the three distinct powers, attaching themselves to the several organic textures of muscles, of the digestive organs, and the instruments of circulation; it would, perhaps, on a more close investigation of the subject appear, that all the changes which take place in the alimentary canal, are referrible to correspondent changes in the circulation. The changes which are sustained regard in almost every instance, the nature and quantity of the secretions; and these circumstances we are well assured can only vary with the circulation. I have made this remark, because there are not wanting those who are in the habit of thinking all diseases in their first developement to originate in changes of the circulation; and it would hence follow, if this idea were correct, and if it could be shewn that these changes are salutary, that the definition which I have given of the term disease, must be universally admitted as unobjectionable.

215.—So intimate is the connection subsisting between the heart and every part of the system, however remotely situated, that it is a matter of impossibility, that any injury can obtain to any considerable extent without influencing, in a proportionate degree, this most important viscus. It matters not in what situation the affection exists, neither is it necessary to the bringing about this uniform participation that it should involve an organ directly indispensable to our existence. A simple ulcer on the extremities, on the toes or fingers, is as competent to produce it, though not to a similar extent, as an ulcer of the lungs, or of any viscus of the first importance; indeed so trivial are the injuries apparently, by which this sympathetic effect is sometimes occasioned, that the cause of the constitutional disturbance eludes our detection.

216.—The uniformity with which this increased action of the heart succeeds to injuries of remote parts,

shews us decidedly that it is not the result of accident, or in other words, that it depends on no peculiarity of the existing circumstances; it demonstrates to us, that it is a process instituted by nature to the accomplishment of some great object. Whether is there in this object such as would involve the destruction of life—or is it not, in conformity with the foregoing ideas, with more reason to be considered as for the purpose of averting death? Certain it is, that this sympathetic fever (as it is technically termed) is a natural process; and if the end to which it be naturally produced be regarded as destructive to the animal, it stands as a single instance among the extensive works of nature, that a process has been established for the sole purpose of exterminating life.

217.—We will examine, and for the sake of following these variations of circulation through all their changes, we will suppose an instance in which it has occurred. A man in the full vigour of circulation meets with a compound fractured leg; he is found, not with a pulse as before the accident, but the heart has received information of the event, and its action is depressed, its systoles are less frequent, and the quantity of blood ejected by the ventricle at every contraction is small, and thus occasions a correspondent pulse. The force of the heart's contraction is also lessened; the blood leaves the surface of the body, giving rise to shiverings and coldness of the extremities—in fact, the patient is at this time suffering from impeded circulation; he is perhaps at this moment so far reduced, that the infliction of any further injury by amputation would completely suppress the powers of the heart, and occasion death. He remains in this condition, probably, for some hours, when the circulation commences to be restored, and these several symptoms gradually vanish; the heart's action increases both in strength and quickness, the pulse becomes fuller and stronger, the vessels on the surface are again injected, and the shiverings are exchanged for a feeling of a comfortable warmth. This re-active process, when it has taken place, removes the immediate danger consequent on the injury; and this being done, a process is set up by which to repair the damage which has been incurred. The union of the fractured bones, and the healing of the external wound, are the next things to be accomplished—the bone is to be united by a deposition of new bony matter, and the soft parts are to be repaired by a pouring out of gelatine, into

which is to be deposited the material which characterizes its respective organization; these several objects cannot be attained but by an effort of the circulation, and there is accordingly produced, after a short lapse of time, sympathetic fever. The sympathetic fever thus occasioned is constituted in a quickness of circulation; but the change is absolutely requisite to the reparation of the mischief; it is sometimes carried to too great an extent, and exhausts the powers of the constitution, and therefore, peremptorily demands scientific modification. In one case it shall happen that the powers of the constitution shall be adequate, by this process, to unite the bones, to heal the soft parts, and in fact to complete the cure; but in another it shall occur, that the constitutional effort is insufficient. In the former instance he recovers by this process, in the latter he dies; because the system was not capable of bringing it about to that extent, or, of continuing it to that period which was requisite to the cure.

218.—That inflammation and fever are essential to the cure of injuries thus sustained, may clearly be inferred from the fact, that in aged persons, in whom the circulation is not easily excited, bones are much longer in uniting, and wounds are much longer in granulating, than in younger subjects in whom the circulation is vigorous; from this cause it sometimes occurs that in old persons no union can ever be procured; in other cases it happens that from the absence of the requisite degree of inflammation, the process of union is only half completed, and cartilage is substituted for bone; and in these instances surgeons have endeavoured to produce a cure by sawing, filing, and otherwise irritating the extremities of the fracture to excite that inflammation which was naturally for some other reason refused.

219.—These remarks apply not only to compound fractures; sympathetic fever is the same in effect, from whatever cause it be produced; it is uniformly instituted for the wise purpose of repairing lesion of some one part of the system. The first tendency of all accidents is to depress the circulation; the re-active process above alluded to is essential; but it might even be questioned if this first effect, this diminution of the action of the heart, does not bear with it in its disadvantages. If a large vessel be ruptured in any part of the body by any injury, this lessening of the force and velocity of the circulation must

undoubtedly be beneficial, in as much as it would afford time for the formation of a coagulum, by which to suppress the hæmorrhage which must otherwise occur—in this instance the depression of the heart's action must be beneficial; and it is very probable, were we acquainted better with all the attendant phenomena, it would prove to be an effect of the same uniformly protecting nature as sympathetic fever itself.

220.—The method by which hæmorrhages in general are stopped by nature, points out to us the wonderful resources which under all emergencies she possesses. If a vessel by any accident be wounded or ruptured, a coagulum is formed at the orifice, by which the bleeding is made to discontinue. In the lesser order of vessels this formation takes place spontaneously; but where the vessel is large, the rapidity of the flux of blood is too great to admit of its being formed in so direct a manner; it therefore happens that faintness is brought about, and by thus reducing the velocity of the blood's motion, an opportunity is allowed for its coagulation, and the bleeding is thus prevented. This coagulum, however, is only temporary; it after a time loses its character of coagulum, and becoming organized, effectually renders the vessels ever afterwards impervious. This has been shewn by the experiments of Dr. Jones, and confirmed by their frequent repetition; and it has been moreover shewn, as regarding arteries, in the experiments of Dr. Parry, that where vessels have been obliterated by ligature, or even where portions of arteries have been removed, a series of branches have been made to shoot from the lower to the upper portion, or rather from the portion next the heart to the other extremity, and supply the place of the one obliterated. This is certainly a surprising instance of the restorative powers of nature; but it would be curious to ascertain if these several branches, taken collectively, did not exactly equal the calibre of the artery which was destroyed.

221.—I have before observed, that many of the operations of nature are carried to an extent which is apparently superfluous; and it would almost appear that a remedy has been supplied, even to this superfluity. This idea at first appears somewhat parodoxical; but when we reflect that the laws by which our constitution is governed are of a general, and not of a particular nature, it becomes more reconcileable to reason. Thus dropsies, when re-

sulting from inflammation of serous membranes, relieves the inflammation; which can be often traced as resulting from a salutary protecting process against some other affection involving danger. This much is however certain, that dropsies very commonly constitute the natural cure for inflammations—ascites relieves inflammation of the peritoneum, hydrothorax of the pleura, hydrocephalus of the brain, hydrocele of the tunica vaginalis, &c. Dropsies sometimes succeed to other causes; but their object is to relieve other parts, and to procrastinate and delay the occurrence of some greater evil, which would, but for their salutary effect, occasion death.

222.—There is a species of dropsy which occurs after attacks of long continued fever, in which inflammation of the cavities into which the effusion has taken place, appears to have no share in their production. I allude to the frequent occurrence of ascites after scarlatina, meazles, small pox, hooping cough, or in fact any other disease which is productive of much debility. I think the effusion of serum at this period constitutes a very beautiful example of an effort made for the purpose of prolonging life. The principle is this—the heart at this time, from the long continued excitement which it has suffered, is extremely debilitated, and is incompetent to the circulation of more than a certain mass of blood; under such a state of things, it would appear almost impossible that any remedy could be devised; because, on the other hand, a vigorous circulation is required for the purpose of compensating for the waste during the disease; this would lay aside the propriety of diminishing the entire mass of blood, and a difficulty would be consequently incurred. The globules of the blood is that part only which is necessary to the renovation of the system; and nature, therefore, without taking from these, diminishes the volume of the circulating mass by an effusion of serum into some one part of the body; the heart is equal to the circulation of the remaining part; its powers gradually increase, and health is as gradually restored. This constitutes a very fine example of the extent of the resources of nature to the grand object of preserving life.

223.—Instances of the salutary powers of nature might be cited to an almost unlimited extent; but it is particularly worthy of our attention to observe in the formation of abscesses, the means which she employs for the

throwing off some extraneous body, or something noxious to the constitution. It is also curious to contemplate on the fact, that all extraneous bodies, in their expulsion from the constitution, tend towards the surface; and that the same power in defence of vital parts is exercised with regard to abscesses in general; by which a general constitutional balance is salutarily brought about.

224.—It is unnecessary to increase the number of these facts; but as it has been conceived that none of these laws which have been laid down, with regard to affections in general, are applicable to the introduction of poisons into the constitution—I will remark for a moment upon this head. I think that nature is possessed of means by which to obviate the effects of poisons when introduced into the system; and that she has the same provisions against those diseases which we term specific, as against the extermination of life from other causes. I shall choose the example of syphilis, as being one of a very observable nature, and the most frequent perhaps of any. Up to a very recent period it has been considered, that for the cure of syphilis it was necessary to employ a specific medicine; this medicine was uniformly prepared from mercury; and mercury has been, therefore, universally considered as a specific for the morbid poison of syphilis. Where this virus is applied to a secreting surface, it produces inflammation; and that inflammation is an attempt made to prevent its absorption; when this fails, it is absorbed; a sac is produced similar to the one from which it was propagated, and another effort is here made to repel its introduction into the system. This effort also fails very commonly, and the matter is carried onwards towards the circulation by the absorbents; it no sooner reaches the glands, than it very ordinarily produces inflammation and abscess; and its farther passage is perhaps prevented by its expulsion from this place. If this is not occasioned, it is carried into the mass of blood; and here it becomes necessary to procure its expulsion by more strenuous means—a degree of symptomatic fever is generally excited; but it is not sufficient to produce the salutary effect; it therefore becomes necessary to disorder the constitution, to produce artificially that disturbance which is naturally excited in other instances.

225.—Mr. Abernethy has taken very different views of the subject before us; yet in his Lectures he has re-

cited excellent examples in corroboration of the fact.—He remarks, "that a man in health may receive a blow on his body, which does not materially injure the organs near the part, but a degree of irritation is produced, the stomach will not receive food, the tongue is furred, the bowels do not act; when perhaps at the end of three days a discharge from them may take place, when all the symptoms will cease: previously to which period he had been *delirious*, has had subsultus tendinum, quick pulse, skin hot and dry, and occasionally breaking out into sweats.' Here, then, is the relation of a man being relieved by what may be termed a critical evacuation from the bowels; and it appears sufficiently convincing that the stomach, in the first instance, was unequal to the office of affording relief to the injury sustained, until assisted by auxiliary powers.

226.—THOSE cases in which the natural efforts exceed their required force, and in which, as I have before observed, the adapted means exceed the required effect, demonstrate to us these particular affections which we denominate acute diseases: here the operations of nature are apparently superfluous; and the utmost care of the physician in the strenuous use of depletions is requisite, and proves sometimes insufficient to their controul—such are inflammations of the brain, the lungs, the liver, and of all other organs which are of primary importance to our existence. In these, increased action to a certain extent, I should contend, was undoubtedly necessary for the welfare of the particular organ; but to the extent in which it is presented to us in cases under such circumstances, it has exceeded the required limits, and calls loudly for medical and surgical interference.

227.—I am aware that there are many who will start at the idea, that inflammations of such important organs should be deemed of a salutary nature; but it is only necessary to appeal to the best established principles of physiology and pathology, to be convinced of the correctness of this view. Does it happen, I would ask, that the circulation in either of these organs (or to extend its application)—does it occur in any one part of the system, however apparently inessential to the continuance of life, that the circulation is uniform and carried on to the same extent under all circumstances? One cause shall operate

in producing an increased determination of blood to one organ, another cause widely different shall produce a similarly sensible effect upon another, and the reverse of these causes shall produce a correspondently reversed effect, in occasioning a diminution of circulation in the particular organs.

228.—To render the subject more easily conceived, I will mention only some of the most obvious causes which operate to vary the extent of circulation in these organs. It is well known that all sudden emotions of the mind increase the action of the heart, and by so doing bring about an increase of circulation in the brain; and with such uniformity does this circumstance occur that no one can doubt that it is a natural operation. If it be a natural operation, the conclusion is direct; it is established to the furtherance of some good and beneficial end to the constitution; and viewed in conjunction with other instances of a similar nature, is undoubtedly induced for the purpose of preserving the organ from some otherwise accruing evil, or of giving due and necessary support to it during the operations it has to perform. This increase of circulation then to a prescribed extent is requisite and healthful; but these same emotions of the mind, in habits otherwise weakened or affected, become the causes of that affection which we denominate inflammation of the brain.

229.—With regard to the liver, the same thing is to be observed; and we have ample evidence that the quantum of circulation is continually undergoing variations in its extent; under one circumstance of the constitution, it shall be increased beyond its ordinary limits, and at the instigation of other causes it shall be diminished in the same proportion; in fact, there is little doubt to be entertained that for the preservation of health these changes are absolutely requisite. Do we not observe that the bile is continually sustaining such a change both in quality and quantity; and this being the case we are directly led to the conclusion, that the process of its secretion is suited to the particular circumstance of digestion; and that a bile which is appropriated or fitted to the completion of the digestive process of one kind of food, is not at all times adequate to the perfection of that process when operating upon different materials.

230.—The circulation of the liver then is capable of varying and accommodating itself to the particular demand

made upon its secretion. These variations in the circulation to a certain extent are salutary; but as I have mentioned with regard to the brain, so if they are extended beyond their required limits, they present to us those symptoms which lead us to recognize inflammation of the liver.

231.—These inflammations when they are carried beyond their salutary bounds, are incompatible with the continuance of life, but for that chain of re-actions supervening from one organ to another, when the first has been either ineffectual or productive of impending evil to the constitution; indeed, nature appears to have provided our system with means by which to ward off the effects of her apparent superfluity; thus no sooner have these organic inflammations from such a cause obtained, than other powers are immediately roused into action, and other organs are made to partake in the great salutary effect of remedying the evil. In inflammation of the brain, the liver, or the lungs, the stomach and bowels present to us the most conclusive evidence of that vast disturbance which their functions are sustaining; in fact, where is the organ in either of these affections, the disturbance of which is not positively evinced.

232.—So much regards acute diseases—in these there is an unusual abundance of re-actions, and our great object in their treatment is to subject them to controul; but chronic diseases are utterly different in this particular, in as much as it would appear, that during their progress there is an insufficiency of these re-active salutary endeavours to bring about their cure.

233.—EVERY one is aware of the difficulty which is usually opposed to the cure of all chronic diseases; and to every practitioner it must appear obvious, that the means which are applicable to the treatment of the one, are far from being equally successful if they be adopted in the other. This would prove that each of these classes of affections possess a different character; and I am inclined to believe that the existing distinction is comprised entirely in the fact, that in acute diseases we have an abundance, and that in chronic affections we have a deficiency in these re-actions.

234.—We seldom observe that the digestive organs are as much disturbed from their ordinary functions in chronic

as in acute diseases, and the same observation will apply if extended to any of the other organs.

235.—In acute diseases, as I have before observed, the object of the attendant is to diminish; and in chronic diseases, I speak with deference, I think, that our practice would be more successful if directed to the object of increasing and keeping up, by artificial and medicinal means, those re-actions which we observe to be resorted to by nature in those of a more acute form; I can only say, that it is an observation which I have found of infinite utility, when called upon to devise a mode of treatment for their relief; indeed, I think, it appears to accord with the practice which every practitioner must have found serviceable in these very common and usually troublesome disorders; how often, and almost I would say, with what uniformity do we see the beneficial effect of occasionally small doses of disturbative medicines, I will cite the popular administration of blue pill; the purgative system of Hamilton subscribes to the same principle; and it has recently been remarked by M. Lenthais, that he has succeeded, and recommends to be adopted, the plan of administering repeated doses of tartar emetic in phthisis, of the most established and decisive character. This acts, I conceive, in conformity with the same principle, by artificially exciting those efforts, which from the long continuance and slow progress of the affection have become dormant, and are usually not developed to that extent which is requisite to the obliteration of the disease.

236.—In the adoption of those means to be employed for the bringing about this important object, some choice, however, is to be exercised; they are not to consist of such medicines as are capable of producing a violent operation; but should rather consist in the widely different plan, rather of soliciting than of stimulating, and urging the intestinal canal to a violent operation upon its contents; for when we introduce into the stomach purgatives of a more drastic character, we do not elicit that species of reaction which is calculated to throw off disease, but excite only that temporary change which is effectual in removing the purgative which was introduced.

237.—Many are the diseases of which it might be said, that every attempt at acquiring a correct idea of their pathology has hitherto been unsuccessful; but, I

think, it will be allowed, that this observation will admit of a more positive application to the subject of insanity than that of any other. There is no other disease with which I am acquainted, but has at some time or other, derived considerable elucidation from a repetition of dissections; but, notwithstanding that opportunities of dissection are peculiarly frequent in persons who has suffered from madness, it is yet to be learnt that the appearances which are displayed by the several organs of the body, at all differ from those which might be denominated healthful. Dissections, however extensively they have been prosecuted, have thrown no light upon the disease insanity; and we remain as ignorant of its nature at this moment, as were our ancestors centuries before us.

238.—I think, that a little consideration, will lead us to conclude that there has been ground for an expectation of discovering on dissection, that change of structure which is occasionally to be observed in other diseases; but it would appear that insanity is not the result of any disease or injury of the brain, and that the mind alone being diseased, is sufficient to demonstrate to us those everal effects, and those many different species of intellectual aberration which fall under our notice.

239.—That insanity consists in an affection of the mind, independently of any change necessarily induced in the structure of the brain itself, would seem to be supported by the observation, that other organs occasionally deviate from the natural and healthful performance of one of their several functions, without necessarily involving a total cessation of their operations; the operations of the mind constitute a portion only of the variety of the functions the brain has to perform; and it would therefore appear reasonable to suppose, as is the case with all other organs, so it is with the brain, that it is capable of erring in the intellectual operations, without requisitely incurring a morbid execution of the whole.

240.—It is for this reason, that dissections have hitherto been unsuccessful in pointing out the real nature of the affection. Madness is not necessarily connected with altered structure of the brain, neither is it uniformly the result of its disease; it is a disease only of the mind; and abstractedly considered, it is perhaps as much within the province of the metaphysician as the logical definition of mind itself.

241.—Perhaps there could be no discovery more important than that which could explain the causes producing madness. Without the slightest idea of presumption, may we not consider that the human reason is incapable of maintaining its ground in the human subject merely because the vital powers have been so much exhausted, as to be incapable of giving it due support? And is not the human reason often supended, merely that the power which is required to maintain it, may be effectually employed elsewhere, for the purpose of repairing the general constitution of the body, and thereby restoring it to a healthy state, both for its mental as well as bodily functions? May not this temporary suspension of the powers of the active intellect, be referred to the same mode of elucidation as the quiet state induced during sleep? Does not sleep answer in obtaining fresh vigour and reparation in the healthy and ordinary course of human life? And may not other and far different modes of removing mental operations be necessary to the relief of other kinds of exhaustion, which the human constitution has undergone, and plans of cure be immediately and reasonably obvious?

242.—Other re-actions, in other directions, influence the operations of the mind; thus gout often alternates with delirium and with mania.—Thus dropsies often disappear when mental disturbance supervenes.—Thus, also, (and in an endless variety of instances) does mind become affected by the healing of wounds, the ceasing of discharge from ulcers, from the skin, or from blood-vessels situated in various parts of the human body.

243.—According therefore to this view of the subject, and agreeably to the plan I proposed to bring forward, all the symptoms of what is called disease, are operations destined by nature to preserve, not to abridge the period of human life, they are re-actions salutarily exerted against all those causes which would shorten life. They are the corrections of our mental as well as bodily indulgencies, they are operative against casualties, and they point out to mankind, even whilst they produce pain and afflictions, the safest and most innocent modes of conduct that should be pursued in the world.

244.—In a state of nature, where all the powers of the human constitution may be supposed to be properly balanced, we may conceive, what appears to be the fact, that few of the higher orders of disease are called forth.

We see that animals in their wild state are seldom afflicted with such maladies as those domesticated and brought under the influence of artificial management. We find, also, that the more the human frame is controuled, and prevented from the natural and inartificial exertions of its powers, the more obnoxious is it to the violences of disease; or, as I should say agreeably to the foregoing ideas, the more necessary is it that the exertions and re-actions of natural powers should be called forth, in order that the frame may not be destroyed.

245.—Did not the human frame wonderfully accommodate itself to the existing circumstances under which it is exposed in the world, the period of human life would be short. The extremes of heat and cold, hunger and thirst, and repletion, the varieties of food, &c. would all at once tend to destroy the human fabric.

246.—Not only, as I have already shewn, are the reactive powers exerted to deliver us from the fatal operation of natural causes, but the mind and body are so connected as that they mutually serve in the preservation of each other. The balance is so wonderfully preserved between the active and inactive qualities of both mind and body, that there will not, I apprehend, be much difficulty in tracing the details of this interesting subject pretty clearly to elucidate cause and effect, as in the operations of the external world. It is clear that the power of the heart, for example, or any other organ absolutely essential to life, (for it is not necessary to come now to the consideration, whether the heart, or brain, or stomach, &c. is original), is exerted during our waking hours, to supply the powers which are actively employed in the body, as well as those which are exerted in the mind. The power which we exercise, whilst awake, in controuling, regulating, and exerting the mind, is a power as much dependant on the heart, as the exertions of the muscles of the body are dependant on the same organ. Were the action of the heart to cease, the one would be unsupplied as well as the other. We find here an admirable provision made by nature to repair exhaustion, from exercise and fatigue, by sleep. During sleep the mind is not employed, at least that active and controulable part of it whose powerful exertions constitute the chief features of our waking hours. The heart is not then called upon for that supply of power required for the active mind, and therefore it has an abundance for

supplying the constitution generally, and for repairing and removing the exhaustion occasioned by the exertion of the day. When this supply and repair have taken place, the heart becomes again capable of its double office of giving efficacy to the exertions of both mind and body. The waking balance is again restored.

247.—It must be here observed, and a very little examination of the subject will be convincing to every one, that during our waking hours we possess, as it were, two distinct minds—the one active, controulable, and which we can use at our discretion; the other uncontroulable, and forming associations. The one is active, and is exerted from us—the other is internal, and produces by association all those links which the active mind brings forth and uses with reason and judgment. All our reason resides with the one; dreams, reveries, and unconnected ideas, as in madness, &c. in the other. When therefore we have fatigued ourselves and our bodies, and their powers have exhausted their supply, the active mind recedes, comes into the range of the automatic mind, and our ideas have not any reasonable connection, following only the associations, dreams, or is absorbed in reveries.

248.—The refreshment and repair which the human frame experiences from healthful sleep, would lead us to expect that some alleviation must accrue from similar suspensions of the active and controulable mind. It would appear from the abatement of symptoms which takes place when the mind becomes disordered, that sleep, under all its varied forms, till the phenomena assume the character of delirium and insanity, is restorative, tends to prolong the duration of the constitution, and is one means adopted by nature to allow a supply of power, uncalled for in one direction, to be employed in the restoration and repair of the bodily frame. This great sacrifice is not called for but under extreme circumstances; and these circumstances do not occur in good constitutions unless broken down and exhausted by causes which go beyond the re-active powers of the several organs of the bodily frame.

249.—A patient had laboured under all the tormenting symptoms of asthma; had become dropsical, so much so that intractable sores had taken place in the lower extremities, and fluid had poured forth from the broken skin to a very great quantity. The respiration was extremely difficult; the recumbent posture was entirely

abandoned, and suffocation appeared constantly impending —in short, all the symptoms of anasarca and hydrothorax were well marked. Of a sudden this patient became insane; the voice which had been obscure was loud, distinct and clear; the breath was not oppressed; the kidnies performed their functions with healthful regularity; the sores which had resisted all means of cure, healed of themselves —in short, all bodily indisposition ceased. This patient remained deranged in intellect for about a month, recovered from it, and remained sane, and more and less free from bodily complaint for a year, when dropsical symptoms re-appeared, and the patient, at the age of between seventy and eighty, sunk under the symptoms of water in the chest.

250.—Those who have but superficially witnessed the symptoms attendant upon mental derangement, must have observed the resemblance they bear to the phenomena of sleep; and those who have felt the disturbed fancies of the mind under unsound sleep, must associate them in idea with delirious raving. In the transition of the human mind from a state of sanity to mental alienation, the countenance undergoes a visible alteration; the eye seems to lose all interest in regard to external objects, and the sensible and active mind appears to recede internally; the movements which take place assume a mere automatic character, and the mind no longer acts under the direction of reason. Even whilst this change is taking place, and even after the reasonable mind has left the patient, it is often very possible to recal the receding sense, and as it were, to awaken the patient from this apparently incipient sleep of delirium. This mental debility is to be often observed in the most reduced state of bodily strength, when all the functions are rapidly yielding to the stroke of death. It is impossible not to acknowledge the resemblance that this state bears to natural and ordinary sleep.

251.—The following case shews that even in a more advanced stage, where the mind has been totally absorbed, and where the automatic raving, and as it were, the negative exertions of the mind had taken place, that the patient could be awakened out of the delirium, and that the reasonable mind could be again called forth and put into action. A patient who had several times been afflicted with mental derangement, was under the most raving state of madness. A blister had been applied to the back of this patient, and this blister had excited much inflammation,

and was when touched painfully sore. During the most furious state of the patient, I rubbed the sore with my hand, and instantly a calmness of mind was perceptible; the patient talked reasonably and coolly, and was in fact restored to perfect sanity. The hand was withdrawn, all the symptoms of madness returned, the mind gradually receded, the eye lost its intelligence, and the most violent exertions of raving took place all over the frame. Time after time was this experiment repeated; and during a few hours these alternations of sense and frenzy were called forth and observed. In the intervals of reason, whilst the bodily excitement was kept up, by provoking with the hand the pain from the blister, the patient reasoned upon the complaint, and the obvious request was that every effort should be made to resist the attacks of the disease. The patient admitted the propriety of this endeavour, and it was truly interesting to observe the exertions that were made; but nothing could for any length of time resist the over-bearing violence of the symptoms of the disorder. In this as in many other cases, the patient seemed, as it were, awakened out of sleep by the bodily pain; in which sleep the maniacal ravings appeared similar to, though a high extension of any idea we can form of restless dreaming and somnambulism.

252.—During our waking as well as sleeping hours, the mind always acts; the controulable mind and the associating act together when we are awake; when we are asleep the associating mind only acts.

253.—The impressions upon the body regulate the course of the more passive mind, and the associating changes of floating images, depend on the varied affections of the bodily frame. Thus dreams either pass on smoothly, or are disturbed, according to the influence the feelings of the body have on it. The active mind is disposeable; we act with it and can controul it, and it constitutes all that is reasonable in man. It is the waking mind, and can be more or less exerted according to the strength of the vital powers. It appears that the exertion of this active or reasonable mind, requires a prodigious vital supply, as is shewn in many instances. The suspension of this reasonable or active mind allows both in health and sickness sufficient power for refreshing, repairing, and healing the body. Thus, sleep takes off the effects of labour and fatigue.—Thus delirium, &c. allows the body to recover

from the most grievous states of weakness and exhaustion: and thus, do many of the most desperate states of disease assume a promising aspect, as soon as the active mind has ceased to demand of the heart that supply of power necessary to its exertion. The power, therefore, which has been expended in the mind is applied to the body, and the consequence is reparation and recovery of the constitution.

254.—Whilst the mind remains reasonable, we find the powers of life sink fast in some fevers, the pulse gets weaker and weaker, and the patient is incapable of making any exertion; at once delirium ensues, and force only can restrain the increased bodily powers; thus the suspension in this instance of the mind, imparts power to the frame, and is the means employed by nature to repair the injuries and exhaustion occasioned by noxious agents. It is according to this view of the subject, the power employed to avert the fatal consequences. Were the powers of the body to cease, the mind would be involved in the calamity; but by this mode, the temporary suspension of the controulable mind, as in sleep, effects the reparation without any ulterior detriment to the human constitution.

255.—"The following (Mr. Richerand observes) is the order in which the intellectual faculties cease and are decomposed.—Reason, the exclusive attribute of man first forsakes him—he begins by losing the faculty of associating judgments, and then of comparing; of bringing together and of connecting a number of ideas so as to judge of their relations. The patient is then said to have lost his consciousness, or to be delirious. This delirium has generally for its subject the ideas that are most familiar to the patient, and his prevailing passion is easily recognized—the miser talks in the most indiscreet manner of his hidden treasures—the unbeliever dies haunted by religious apprehensions. Sweet recollections of a distant native land, then it is that ye return with your all powerful energy and delight! After reason and judgment, the faculty of associating ideas is next completely destroyed. The same occurs in fainting, as I once experienced in myself:—I was conversing with one of my friends, when I experienced an insuperable difficulty in associating two ideas, from the comparison of which I wished to form a judgment. Yet syncope was not complete, I still preserved my memory and the faculty of feeling. I could distinctly hear those about

me say, he is fainting! and exert themselves to relieve me from this condition, which was not without enjoyment. The memory then fails. The patient who, during the early part of his delirium, recognized the persons about him, no longer knows his dearest and most intimate friends. At last he ceases to feel, but his senses vanish in succession and in a determinate order; the taste and smell cease to give any sign of existence; the eyes become obscured by a dark and gloomy cloud; the ear is yet sensible to sound and noise: and no doubt it was on this account, that the ancients, to ascertain that death had really taken place, were in the habit of calling loudly to the deceased. A dying man though no longer capable of smelling, tasting, hearing, and seeing, still retains the sense of touch; he tosses about in his bed, moves his arms in various directions, and is perpetually changing his posture."

256.—Madness, without diving for the present into its more definite character, is seen clearly to consist in a suspension, either partial or general, of the intellectual powers; and in this particular, it indicates to us its similarity and relationship to delirium and sleep.

257.—I think, it can be shewn that the several conditions of sleep, delirium, and insanity, are so intimately connected in their nature with each other, that they are modifications only of the same state, and that there is a regular gradation through a series of changes from sleep to delirium, and from delirium to insanity.

258.—It is not necessary in this place, to consider sleep abstractedly from its several connections; it is my object to render the matter as easy of comprehension as is possible; and for this reason, I have avoided already on several occasions to enter into metaphysical reasoning. Sleep might be considered as a condition which, under a natural state of the constitution, is induced at regular intervals; and from the periodical manner in which it is produced, although of a negative character, it is worthy of being regarded as a function as inherently established, as the several processes of digestion, secretion, or even of circulation; it is necessary to the continuance of health; and its cessation, although, perhaps, not so rapidly destructive of life as an interruption of the other functions, must ultimately occasion death. It becomes a question, why it is thus necessary to life? And in order to reply to it, it will be necessary to reflect under what circumstances it

occurs, and what are the usual consequences of its having taken place.

259.—During a state of watchfulness there is a rapid dispensation of the nervous energy; the five senses are continually in operation; the intellectual powers, to a greater or less degree are exercised; the exertions of our voluntary muscles are constantly being displayed; and besides these, the functions of the heart, and all the other animal organs, are carried on with vigour. A state of watchfulness, therefore, might be considered as a state of effort—a condition in which the nervous system is strained beyond its easy limits, and one which tends to the exhaustion of the nervous energy. After that it has continued for a certain laspe of time, modified by exercise, and other circumstances, rendering exhaustion more or less complete, sleep gradually pervades the system, and is maintained, unless broken in upon from some accidental cause, until the object of its accession has been effected.—In what this object consists is clearly pointed out to us by a comparison of those feelings which preceded, with the phenomena which are pourtrayed after it has been dispelled; the comparison demonstrates to us that it is a means had recourse to and adopted by nature, for the purpose of renovating and invigorating the powers of the system. We are fatigued in body, we are agitated in mind, by the apparent threatening of the most imminent dangers; we incline to rest, and if sleep can be obtained, we arise perfectly freed from our bodily feelings of exhaustion; our minds are invigorated, and we are enabled from a calm and thorough examination of their dependencies, to defy those dangers which before appeared inevitable. Dr. Park, in his work on animal life, has well treated upon the subject of sleep, and has explained its several relations. During sleep, the action of the heart is rendered slower, and the required force of its contractions is very much diminished by the horizontal posture, the only position which is natural; secretion is rendered extremely slow, and all the functions of animal life are, in a word, performed with as little expenditure of power as is compatible with their bare continuance; and the result of this suspended operation is a restoration of the system to strength and vigour. Sleep varies in perfection according to the several circumstances under which it is occasioned; as the bile necessarily varies and accommodates itself to the quality and quantity of the food which it has to digest, so

sleep may be said to vary in like manner; a sleep which would be beneficial under certain circumstances, would not be deemed appropriate if induced at a different period; in some sleeps the whole of the intellectual powers are suspended; whilst in others, the faculty of association continues in operation, giving rise to dreams, the other powers of the mind being alone suspended.

260.—These variations and modifications of the single condition of sleep, conduct us by slow degrees to delirium, from delirium to madness, from madness (the compleat state of coma intervening), to apoplexy; they are all, I think, modifications of the same condition, and are, I conceive, instituted for the same most beneficent of purposes.

261.—With regard to delirium more particularly, it will admit of being shewn, that the circumstances under which it most usually occurs are those of debility; we observe that it is an attendant on the last stage of fever, when the exhaustion of nervous energy has been extreme, and when the powers of life are so far diminished, that they are incompatible with the continuance both of the intellectual and animal functions. The intellectual operations not being requisite to the continuance of life, they are for a time dispensed with; the mind is accordingly suspended, and the power which would, under a natural state of parts, have been exhausted in this direction, is determined to a different part, to those organs, the processes of which are indispensable and necessary to the existence of the patient. How often does it occur that we observe patients, who from an attack of typhus, or any other violent fever, are reduced to that extremely debilitated state that they are incapable of motion, remain silent and passive, or unable to be roused by any stimulants; in whom the voice has ceased to be distinguishable, and who are in fact at the lowest ebb of life, how frequently does it happen that delirium ensues; the mind being accordingly suspended, its share of power is determined to the animal organs, their functions are carried on with an increase of vigour, and the united efforts of several attendants are perhaps necessary to controul the exertions of this previously passive patient. Every practitioner must have witnessed cases of this kind; and the fact which they exemplify will admit of no other explanation than the translation of power from the brain, from the intellectual faculties to the animal organs.

262.—There are many physicians who are in the habit of considering that delirium, from its immediate cause, refers to an increased circulation in the brain. To ascertain its immediate cause is a subject involving a vast deal of discussion; and as it is enough, for my present purpose, to shew that it is a salutary natural production, its object, and the effects which are occasioned, I shall content myself with remarking, that there are many facts which would appear to be hostile to this opinion.

263.—Nothing can demonstrate to us in a more authoritative manner, that a condition of debility is that which conduces to the production of delirium, than to observe with attention, the effects which result from extensive hæmorrhages, and its almost uniform attendance for a longer or shorter period previously to death. I have oftentimes witnessed with admiration in internal bleedings, where no surgical operation could avail, the beautiful arrangement which nature has displayed in the abstraction of the powers of those parts which are inessential, and in determining them to those organs which are essential to the continuance of life, to the momentous end of accomplishing its preservation.

264.—I think, that whenever the vital powers are from any cause at so low an ebb, that they are unequal to the maintenance both of mind and body, that nature withdraws or suspends for a time the intellectual operation; translates the thus acquired force to the direction in which it is demanded; and thus enables the body to bear up against and support evils, to which she must otherwise succomb, to the destruction of vitality. This, I conceive, constitutes delirium; it is, indeed, that sleep which is suited to the then condition of the body, and it is instituted for a similar purpose in augmenting the bodily powers. It is to this principle of the transference of the powers of the mind, to the due exercise of the animal functions, that the beneficial effects of the liberal exhibition of opium in many diseases are produced. Having now shewn the connection betwixt sleep and its several modifications, and delirium, we return to the consideration of insanity itself.

265.—When we speak of delirium, we speak only of a temporary suspension of the mind, but insanity is of a more permanent character; the permanency of the one, and the transitory nature of the other constitute, however, almost

the only distinction which subsists between them. Insanity is to delirium, what delirium is to sleep; in fact, these three apparently distinct conditions are indissolubly united, and are modifications only of the same state. Delirium differs in its form with the state of the constitution at the periods of its duration; and insanity also assumes a character which is determined by the same circumstance; there are consequently an infinite number of variations in this disease.

266.—The suspension of the intellectual powers determines, as in delirium, an accumulated quantum of nervous force to the organs essential to life, the aberration continues until the powers are regenerated, and the constitution has recovered; in some few instances this happy consequence has occurred, but it frequently happens, from the irrecoverable state of the constitution, that the malady is permanent.

267.—Generally speaking, the immediate cause of madness is debility; in particular examples it may be the consequence of disorganization of the brain from accident; but the limits of these remarks do not allow me to descend to their consideration. The most obvious of the remote causes of insanity is excessive drinking; it is not only the most obvious, but I think, that which is more fruitful in its production than any other. A little attendance on the several changes which characterize a state of intoxication, will convince us readily of its debilitating consequences; and in order to this conviction, it is unnecessary to choose the instance of the habitual drunkard, but to observe the excess of lassitude and weakness which succeeds its first or stimulating effect, as soon as this artificial excitement has been dispelled.

268.—It appears that the heart is capable of performing only a certain number of its systoles in a given time; and it therefore follows, if the rapidity of its pulsation during any portion of this period be augmented, a sedative effect uniformly supervenes, and leaves the system in a debilitated state, suffering under all the evils of a correspondently diminished circulation. The excessive debility which necessarily follows a long course of excitement, is well evinced by the tremor which usually results to the voluntary muscles of the extremities; and how far the mind partakes in this debility is to be collected from that depression of spirits and incapacity of mental exertion which constantly follows an over excitement of the system.

269.—What has been said with regard to the excessive use of spirituous liquors, and the very extensive debility which is occasioned to the faculties both of the mind and body, will apply to stimulants of all other classes. Habitual drunkenness I esteem as one of the principal causes of the vast increase in the number of our insane patients; and if it were practicable to reduce it to calculation, it is probable that it would be found, in proportion as drunkenness becomes more general, so does madness as gradually augment the number of its victims. Dr. O'Halloran, in his published account of the instances which have fallen under his care, mentions, among the several causes which conspire to their developement, the morbid poison of syphilis.

270.—The introduction of any morbid poison into the system by the absorbents must undoubtedly produce debility; it is impossible to determine to what extent, but I think it is more probable that the use of the violent stimulant of mercury, so commonly had recourse to for its cure, is more frequently the source from which madness derives its origin. It is unnecessary to mention, that the use of this mineral brings with it consequences of a most absolutely debilitating nature; it is, perhaps, one of the most powerful stimulants with which we are acquainted, and every person must have observed its obvious effects in exhausting the powers of the system. I have known many cases in which the diminution of vital power was so extensive, after a course of mercury, that nature being unable to maintain the exercise, both of the animal and intellectual operations, has withdrawn the latter, and madness has directly supervened. Innumerable are the instances in which madness has followed the exhibition of a course of mercury, as recounted by various practitioners; but its production has been made to depend upon other principles, than that which I have laid down.

271.—Every mode of life, every habit, or accidental circumstance which is capable of diminishing the vital powers, is competent to become the remote cause of madness; debility is its immediate cause; and insanity, or abstraction of the intellectual powers, is a means had recourse to by nature, in transferring the powers which would have been expended in their exercise, to organs of essential importance to life; it is done upon the principle that such are the only terms upon which life can be continued.

272.—Madness, therefore, is a salutary effort of the

constitution to avert the occurrence of death; and it is sometimes had recourse to, for the purpose of remedying accidents when the vis naturæ in its absence is unequal to the charge. When madness has taken place, the abundance of bodily power which directly takes place, enables the healing process of wounds to go on with vast rapidity; the union of bones in like manner; and, in fact, all the processes of the body are conducted with a wonderful increase of vigour as soon as the mind has been suspended, and its powers translated to the corporeal system.

273.—I HAVE already explained the vast resources which nature posesses to alleviate and avert disease, to the great design of prolonging our existence. I have shewn with what uniformity are the digestive organs resorted to for this purpose—in what manner the liver is made to participate in re-actions of this salutary nature, which are continually taking place. I have already mentioned that when one of these means has proved ineffectual to the accomplishment of this end, in how progressive a manner are the other organs implicated, and that vast chain of re-active processes is propagated from the inferior to the higher powers, until the cause, to the removal of which they have been established, has been ejected from the constitution.

274.—This being done, I shall now proceed to shew, that where by these processes of re-action, nature has been ineffectual in escaping the impending evil, she still is in possession of other resources, which although of an extreme nature, are frequently observed to take place; I mean the power which she possesses, when finding herself unequal to the preservation of the body in an entire state, of sacrificing a part for the purpose of maintaining life in the remaining body. In vegetables, and more especially as they approach the higher class, the same thing is to be observed; a large branch is observed to perish, and the evident consequence of the death of this portion is to invigorate and strengthen in the maintenance of life the remaining trunk; in the pruning of trees we avail ourselves of the same principle; we remove the superfluous portions, and by so doing we concentrate the powers of vegetation in the surviving parts, and not unfrequently by this means do we preserve it from destruction.

275.—As it is in vegetables, so it would appear to be

in regard to animal bodies. Under certain circumstances we commonly experience that some one portion of the body is rendered useless; that its powers are suspended; and in other instances the part is totally destroyed, for the purpose of increasing and concentrating the powers of life in that part, and those organs which are the more essential. I conclude it is for this purpose, because the nature of the circumstances, under which these effects commonly take place, are such as would induce me to believe that there existed a deficiency of power, inadequate to the continuance of the several functions of life in the entire animal. I will commence with the instance of hemiplegia—hemiplegia occurs principally to persons far advanced in life; it happens rarely to young persons, unless connected with some local or general debility: in aged persons there is a deficiency of vital power; whilst in youth, this not being the case, we seldom find that hemiplegia occurs, unless produced either as the consequence of some accidental cause, or from debility induced by indulgence in a luxurious mode of life.

276.—The lassitude, and those feelings of debility, those sensations commonly termed nervous, and that partially palsied state, which not unfrequently precede an attack of paralysis, denote in a very decided manner, that the cause which is immediately productive of this effect is an exhaustion of the vital powers. Under such circumstances nature finds herself unequal to the task of perpetuating the life of the entire system, and she consequently sacrifices a certain portion to the well-being of the remainder. If the existing debility be only to a certain extent, she finds it sufficient to sacrifice perhaps an arm; if it go beyond this extent, she suspends the powers of the voluntary muscles down one side; if it still exceed these limits, she renders the patient either temporarily delirious, or suspends entirely the intellectual faculties.

277.—It is a striking proof that the preserving principle of nature embraces a provision of this kind, in the sacrifice of one part, or in the suspension of the powers of one organ, for the purpose of concentrating her forces in another, in which they are requisite; that during the paroxysms of fever we observe that the secretion of the kidnies, of the liver, of the salivary glands, and in fact of all other parts destined to this function in a great measure ceases; by which the nervous energy becomes accumulated and determined to that part where its presence is most essential.

278.—Another instance in which this principle is shewn is the mortification, which commonly attacks the extremities of aged persons. At this advanced period of life the vital forces are to a certain extent exhausted; they are exhausted to that extent, that being equally distributed over the entire body, they would be unable to maintain the continuance of its vitality; under such circumstances it becomes necessary to destroy and obliterate a certain portion; in fact, to prune the body of its most inessential parts, to perpetuate life in the remainder; she does not sacrifice to this purpose the powers of the liver, of the lungs, or any of the more important organs, these are of moment to the duration of life, even at its lowest ebb; but she accomplishes her object in the destruction of the toes, or if occasion may require it, of the whole foot, perhaps the leg; but she is uniformly careful not to suspend the functions of the more important organs. In this species of mortification it is well known that it is preceded by no inflammation; a fact, which shews that it is a spontaneous and necessary change induced in the part directly to some beneficial end. If we advert to the means which alone are successfully had recourse to, in arresting the progress of this peculiar kind of mortification, we shall see, that however this particular view of the subject has not attracted the attention of physicians, the practice for its success subscribes intirely to this principle. Mr. Pott, has remarked, that the only medicine which possesses any power of arresting the mortification, which spontaneously takes place in the toes and feet of aged persons, is opium; and I believe, that experience has tended to confirm the correctness of this observation. Opium, in this disease, acts as it does in all others; it operates by producing sleep; by renovating the natural forces; in fact, by suspending the operations of the mind; and it is upon this principle, when united with the exhibition of wine, bark, and other corroborants, it proves almost uniformly serviceable.

279.—These two instances, first of paralysis, and secondly of the spontaneous mortification of parts, to the end of producing good to the constitution, are only some of the very numerous examples which are afforded us of the same kind. It might perhaps be asked, in what manner does the mortification, or the suspension of power in paralyzed limbs, invigorate the remainder of the body? It is to be observed, that in the first, in hemiplegia, the nervous energy, from the total cessation of voluntary

motion of the one side, suffers no demand; and in whatever light we view the nature of this nervous connection, subsisting between all parts and the brain, it cannot but be admitted that being suspended in the one part, it is determined with increased vigour to others, the vitality of which continues to be maintained. It is familiar to every one, that the obliteration of one of the senses is capable of increasing the powers of the remaining four; we have very numerous examples of the acuteness of hearing in persons who are blind; and instances which are well attested are not wanting, in which the sense of touch attains a very extraordinary degree of perfection from the same cause. Richerand makes a similar observation; and there are many others of a more recent date, which although not entitled in their fullest extent to implicit confidence, evince to us the truth of the general assertion. It is not only capable of being shewn that in paralyzed limbs, there is a cessation to the determination of nervous energy in that direction; but also, that the circulation being likewise diminished, it is carried on with a proportionate increase of vigour in the more essential organs. If we examine the pulse of the radial arteries in either limb, and compare them with each other, we shall find that the pulse on that side in which the paralysis has obtained is very different, both in fulness and tone, to the condition of the other.

280.—I have in another place mentioned how clearly I have observed the manifest good effects which have resulted to the constitution, from either a temporary or permanent loss of power in the muscles of a limb; and I could here detail a vast number of cases, in which the patients have been labouring for a long period under a great complication of disease, and have been at length relieved by the sudden dropping of the hand; a critical paralysis, by which the natural powers have been augmented, so as to be enabled to expel the noxious and morbid causes from the constitution. As the patient has recovered, and gradually as the demand upon the natural forces has become diminished, the nervous influence has commenced again to pervade the muscles of the part, and the powers of the hand, I have commonly witnessed, to be restored, together with a healthful condition of the body. Every practitioner must have met with similar cases; but the difference of the media through which they have been observed, constitutes the reason that, instead of being looked upon as salutary, they have been considered

as serious evils. So obvious, however, is the circumstance of the rapid healing of wounds, as soon as the powers of one side of the body have been suspended, that it has been almost universally remarked by writers upon every subject in which it has any share.

281.—To sum up what I have already said, I shall be excused if I remark, not only that I am persuaded of the positive existence of this compromising principle, in the sacrifice of a part for the furtherance of the benefits of the whole, but, that it is only necessary for practitioners to take this view of the subject, to be conducted to a more rational and more successful treatment of many of our most troublesome diseases.

282.—It is ardently hoped that the preceding observations, with their concomitant arguments, may have in some degree succeeded in pointing out a rational principle in pathology, at once possessing a beauty and simplicity of arrangement, and developing to the physician a clear and extended view, by which he may be enabled to controul, direct, and assist in the salutary re-actions which are universally instituted by nature, for the purpose of divesting the human frame of those evils which may occasionally occur to it.

283.—It has been admitted on all hands, that the reason of the very different opinions which prevail relating to diseases and their mode of treatment, and the very unstable character of our science, consists in the fact, that amidst all the superstructure, we are in possession of no one first principle; and I think it is questionable, whether or not many of the difficulties in which pathology is involved, may be found to dissipate on the attainment of this long wished for circumstance. It is an acquirement of no ordinary value; for in our arriving at what might properly be termed a first principle in medicine, it is possible that an equal advantage may result, as from the developement of a first principle of philosophical science.

284.—It has been shewn that the organs which are most commonly for the first part had recourse to by nature for the cure of disease, are the digestive organs. It therefore becomes an indication to the physician, whose province it is to assist nature in her operations, to resort to this natural method of procuring the obliteration of all maladies incidental to our bodies.

285.—The good effects attendant on the exhibition of purgative medicines, has well been shewn in the work of Dr. Hamilton; but, however, certain it is that much success attends this mode of practice, I differ most essentially from Dr. Hamilton, in supposing that the beneficial effects are proportioned to the extent to which the purgative system is carried—the fact is, that when purging medicines are exhibited, they excite irritation in the intestinal canal, and this irritation is equal to the quantity exhibited. If a large and powerful dose of purgative medicine be administered, a proportioned degree of irritation is excited; but this irritation is raised by nature to the end of expelling the cause by which it was occasioned; our object is not to produce this violent operation, but, to elicit only from the bowels that re-active power which from some circumstances was withheld, to the production of disease to the constitution—when this re-action has been elicited, experience has convinced me that the most threatening diseases have commonly given way. It is to be effected not by large doses of cathartic materials, but by small and divided doses of a commixture of medicines disturbative in their nature, and calculated to irritate to a certain extent the villous coat of the intestines.

286.—The practice in acute diseases will not be materially altered by these remarks. Nature acts in a general manner in all her operations, and therefore requires alteration and controul. Opium may sometimes be useful, as I have before pointed out, in suspending the powers of the mind, or in procuring sleep; and thus determining to the part in which it is wanting, that power which would have been expended by the intellectual operations—I have also observed the most decidedly beneficial effects to result from the administration of opium in exceedingly small doses, combined with these disturbative medicines which I have before mentioned, by modifying their power, and preventing that excess of irritation which may occasionally occur.

287.—If the foregoing principles and reasonings regarding the symptoms of disease, as operating towards the reparation and defence of the human constitution be correct, many most practical and useful observations must occur, in respect to the use of medicines. We cannot too deeply deplore that system of the healing art which, authorizes and even recommends the liberal use of mercury

in so many of the less violent disorders of the system. By this medicine the higher powers of the constitution are unnecessarily excited, and the defensive provisions made in the organs which are primarily affected, become by the use of mercury exhausted, and for the future inefficient. The mild and corrective laws which attach to these primary organs are passed over and superseded, and a melancholy inroad is made in respect to the introduction of evils, which thus excite the higher re-actions of the most important organs in the body. It is thus that epilepsies, palsies, madness, &c. become of such frequent occurrence, and that after an habitual use of the preparations of mercury, that the slow, safe, and unexhausting re-actions of the stomach, liver, and digestive organs, fail of their purpose. It is not the intention absolutely to decry the use of this mineral; it may be and is often requisite where the constitution cannot be roused by slighter means; but it has occurred to the author to observe that in many instances very mild remedies, such as are unobjectionable in regard to future consequences, have been fully equal in medicinal importance to the task required.

288.—Small doses of medicines, which in large quantities produce intense effects, given repeatedly, so as to solicit and not urge the more violent re-actions; and these doses, combined with similar doses of other kinds, such as may elicit from the digestive organs *generally*, a due performance of their several functions, will do more in clearing the constitution of the causes of evil, than any violent dose that can be given of mercury, or any other mineral poison. If an emetic acts powerfully, the cause that provokes the action is removed, and nature returns to her usual habits—if a purgative act violently, liquid discharges take place, and the action is excited against the drug—the habit of body recurs, and the former state remains. Thus, when there are produced repeated liquid evacuations, the bowels are not emunctorially discharged, and subsequently all the phenomena shew a confined state of bowels. Medicines of the soliciting kind then evince their superior character, and satisfactory results follow their use.

289.—Although every well-wisher to the science of medicine would rejoice at the discarding for ever of the idea of occult qualities, specific, or empyrical operations of any remedy whatever; yet mercury, though not of specific importance, still holds a conspicuous place amongst

those disordering means, so amply supplied throughout the materia medica. I have seen calomel, for instance, when joined with ipecacuanha, and other disordering means, produce upon the foregoing principles such an excitement on the stomach and digestive organs, as to supersede in a peculiar manner, the most apparently desperate state of typhus fever, &c.

290.—The higher re-actions of the constitution are superseded and stopped, by a due excitement of the re-active powers of the stomach and digestive organs, whereby the constitution is emunctorially cleared of that cause which has thus been carried on in the frame, and has there provoked such desperate efforts of nature. The same good result has arisen in other cases where there was great affection of the head, much fever, and high disturbance in the whole constitution; by giving, instead of the calomel and ipecacuanha, small doses of the extract of elaterium, joined with purgative medicine; and indeed it would appear from a great variety of cases, that it is not of much importance what the medicine is, provided that the digestive organs are roused into the proper sort of action. This curative excitement of the stomach, as has been explained already, is very different from such disturbances as occasion violent liquid evacuations, and appears to succeed, by inducing the natural powers of the alimentary organs emunctorially to dislodge the evil.

291.—Those who have been unaccustomed to observe the immense quantities of foulness, which the secretions from the organs of digestion pour forth into the intestines and are thence discharged, will not be able perhaps, at first sight, to acknowledge the powerful remedial effect which then takes place. Those also, who have been taught to consider that the organs of digestion, and particularly the liver, are disordered, or diseased when the evacuations are clay-coloured, foul, and in large quantities, will not readily acquiesce in the doctrine which teaches, that such secretions are healthful and salutary discharges from the fluids of the general circulation of the body. It would also strike such persons as paradoxical and perhaps absurd, if we give a reparatory character to a foul and white tongue, and were to express the belief that it is often useful to excite such a state of the constitution as would form a white tongue, and thence to infer a very favourable prognosis of the speedy determination and

cure of many of the most extensive and formidable constitutional diseases. The author of this treatise is persuaded of these salutary indications of nature; and conceives that the chain of morbid, or as he would say, corrective actions takes place, and is to be traced, link by link, from the slightest stomach disturbance, up to the highest point of real constitutional and mental disease.

293.—The value or importance of each separate part of this chain, is to be calculated as regarding the integrity of the corrective powers remaining in the primary organs, where the curative result obtains with the least expenditure of vital power. Thus, when the white tongue occurs, it is the proof of the existence of such power, and it is to be regarded as an indication of healthful exertion. Thus phagedenic sores shew granulations as soon as that state of constitution is produced which includes the white tongue. Thus returning gout takes off the formidable character which supervenes when it has been misplaced, and has assumed some other character of disease. Thus, also, is that state of the liver which is reputed to indicate a defect of bile, salutary, leading to good consequences, and important as to the ultimate cure; when the clay-coloured and foul evacuations occur in the highest and most extensive diseases of the frame. Calomel and blue pill have often gained the credit really and truly due to the inherent corrective laws of nature. Such a case is reputed bilious, and mercury is given; but although mercury does not absolutely supersede this healthful action, yet we must be blind, if we acknowledge that such a state of secretion from the liver be healthful, if we do not see that forcing a healthy bile, when the liver was emunctorially discharging from the constitution such foulness, must in a degree interrupt the healthy process, and be rather hurtful than salutary. Small soliciting doses of medicines are more efficacious; they keep up the natural operation, and they assist in the grand work of expelling from the body these foul causes and promoters of the most dire diseases to which the human frame can be subject.

I NOW purpose to enter into a detail of such examples as are illustrative of the foregoing principles, and to proceed with such practical observations and remarks, and with the history of such symptoms and cases as have led to the opinions herein advanced.

ILLUSTRATIONS, CASES, &c.

It will not excite any surprise that principles, such as the foregoing, must lead to a practice of medicine far different from what has usually been adopted. It must, however, be admitted, that all successful treatment of disease must fall in with a system which pretends to explain the laws which regulate the actions of organic life. This has been alluded to in (235), and will be continually pointed out in the further prosecution of this work. Some popular plans of cure which, under previous systems, resisted all attempts at generalization, receive ample illustration, when considered in connection with the foregoing principles; and thus it is presumed, that not only will many new plans of cure be suggested, but that many difficulties attending the usual treatment of disease will be cleared up and satisfactorily explained.

The phenomena attending the emunctorial powers of the digestive organs have been amply discussed in the foregoing sections, under the head of stomach, wherein are explained those facts and observations, essentially necessary towards the right understanding of the modes which constitute efficient and successful purging.

As Derham in his Physico-Theology, quotes Dr. Grew (77), and compares the body to the rooms of a house; it may not be irrelevant to the subject to pursue the illustration, and to make the analogy still farther available to our present purpose. It requires no great exertion of fancy to compare the several parts of the human body to the rooms of a house. Each part of the body, as each room of a house, may become contaminated by the introduction of offensive matters, so that the body, as well as the house, may require a thorough cleansing and purification. The rooms remote from the kitchen would be but little refreshed by any purification of that room, and whatever washing be used there, and in the lower parts of the house, would avail but little in cleansing the parlours and the upper parts of the house. The water might pass off after such washings, carrying with it but little impurity through the common sewer, and the best parts of the

house would retain the same foulness as at first. The cleansing ought to commence in the upper rooms; each room should be distinctly purified, and all the noxious matter should be progressively brought down, so that ultimately the accumulated mass of foulness may be washed away through the common sewer. The evidence then of the removal of filth from the house would be visibly demonstrated in the accumulated mass which would pass the common sewer. To make a parallel case with the human body—it cannot avail much in relieving the constitution of impurities, to make any violent clearance of the stomach and digestive organs, and it would demonstrate no very satisfactory proof of the purity of the whole body, even should the dejections pass off in the most healthy and natural state. The parts of the body remote from the digestive process might still remain loaded with foulness and clogged with impurities.

Various purgative medicines have received their names from the parts of the body on which they act in a peculiar manner; and thus cephalic and bilious medicines, &c. have assumed their importance from the organs over which they have been supposed to have a controul. But these medicines will not of themselves, in the manner they are usually exhibited, prove serviceable by any general operation on the other organs of the frame.

Most purgative medicines have a constitutional as well as local effect, and a local and general operation obtain according to the intensity of power and quantity of medicines comprehended under the character of emetics. The due adjustment of the dose, therefore, of these medical agents, constitutes their importance in the practical treatment of disease.

The Hon. Mr. ——— was dreadfully afflicted with the usual symptoms of dyspepsia, for which he had undergone the usual medical treatment. He had taken bitters and tonic medicines generally, and his bowels had been constantly submitted to purgative medicines, and occasionally to the use of different preparations of mercury. He had given up his usual habits in regard to the time of taking his meals, and his diet had undergone a complete alteration. He was greatly emaciated in his body, his stomach was painfully affected after eating all common food; he was very susceptible of all the changes of the weather; nausea, occasional vomitings, flatulence, acidity, and every troublesome symptom of indigestion affected

his stomach; he was (what is called) bilious—that is, his evacuations changed frequently in colour, announcing, according to the common medical phraseology, too much or too little bile. His bowels were uncertain in their operations, but he was most generally affected with diarrhæa, He had been under the very best medical advice, and far be it from me to deprecate the treatment they recommended—their medical reasonings I only mean to question. It had been recommended him to avoid all such things as disagreed with his stomach, to alter all his habits respecting food, to dine at an unusual hour, to avoid vegetable diet—in short, he was desired on no account to take any thing that might in any way provoke the disturbances of his stomach and bowels. Bitters, steel, and tonics generally were the medicines ordered. To this plan and regimen he strictly adhered; his emaciation increased; and he was thought to be on the point of becoming consumptive, and of wasting away in an atrophy.

Conceiving that this gentleman's case was a fair subject for a trial of an opposite system of medicine, and as he was in the habit of reasoning much on these subjects, he admitted the propriety of, and adopted the means already explained. He was convinced that the more he flattered the caprices of his stomach, the greater was the difficulty of discovering any food that would be easily retained, and he was become an absolute slave in the labour of finding any thing that would set inoffensively on his stomach. Instead of choosing all such things as agreed with his stomach, he commenced the cautious use of such sorts of aliment as disagreed the most. He gradually left his dry meat chop for flatulent vegetables, and took small beer instead of weak brandy and water; in short, he disregarded altogether those rules of diet he had before implicitly followed. It may be mentioned in this place, that pain and uneasiness are either aggravated or diminished by moral causes. Whilst even a slight pain is considered as a symptom dangerous to the constitution, a patient lays a great stress upon it; but when that pain is regarded as tending to health, it becomes of minor importance. So convinced was this gentleman that it was necessary to provoke pain and disturbance in the stomach and bowels, in order to his cure, that he cheerfully sustained every increase of disorder with a joyful anticipation. He used to say, that the stomach is now doing its own work, and the result will be that I shall get well. In a fortnight he gained seven

pounds in weight, and the functions of the body returned to a good state of health.

The first affection under which Mr. ——— laboured was hernia humoralis, for this he was blooded both generally and by leeches, and purgative medicines were liberally administered. The local complaint gave way, but his constitution remained extremely out of order. Bilious medicines were freely ordered, and he had recourse to Cheltenham water; at another time his nerves were much affected, and he went through a course of nervous medicines, asafætida, valerian, &c. The Bath waters were recommended, and he took steel medicines as well as tonics generally. He had been, for a number of months, in a wretched state of illness, during which time the local inflammation had often occurred. On the last attack of the local malady, after plentiful depletion by leeches, &c. he was put upon the plan of taking purgative medicines in small doses, regularly repeated three or four times in the day. His appetite had failed him, and he could take but very little nutriment, and that of the mildest quality.—Equal parts of extract of colocynth and compound powder of scammony, six or eight grains of them mixed were given every six hours, or oftener, according to circumstances. After persisting in this plan for a few days, evacuations of so extraordinary a character came away, that his attending apothecary was not satisfied that he did not indulge in large quantities of substantial food.

Under a diet only of gruel, and by the use of the pills, this gentleman continued to part with enormous quantities of solid and foul dejection, till at last he began to have the renovated feelings of health. He recovered perfectly; his countenance re-assumed its healthy hue; his appetite returned, and for years he has had not the slightest return of his original complaint. This case is mentioned to shew what immense quantities of foulness may be removed when the digestive organs act emunctorially in removing foulness from the circulation and the general constitution; and of how much importance it is to attempt to bring about this mode of relief, when the body is so much affected by general and constitutional derangement.

Nature defends herself against noxious agents, and these defensive operations constitute a large proportion of those actions which are comprehended under the term, disease. Far different modes of defence are adopted in one habit of body from what take place in another; and

during the progress of defensive operation, a different series of actions are observed to take place in the same individual.—A young person, whose habit of body rendered her prone to the action of any exciting cause, was seized with pains which were situated in the joints, constituting an attack of rheumatism. These symptoms were in a short time alleviated, by the usual treatment, by depletion, &c. On the subsidence of the rheumatic affection, the patient shewed signs of affection of the head; spasmodic actions began about the muscles of the face, which gradually extended over the whole frame. The appearance of the eyes led to the suspicion of hydrocephalus, but it was soon clear that the disease was chorea sancti viti.

The succession of symptoms which took place in this case, pointed out clearly the existence of some general cause; and the plan was recommended of eliciting from the digestive organs, that emunctorial discharge which it was presumed would clear away from the circulation that foulness which was suspected to be the remote exciter of all these formidable re-actions. Medicines were accordingly given, consisting of under doses of emetic and purgative drugs, so managed as to be often taken, and not to excite any violent re-action of the stomach or bowels. It was surprising to see the quantity of lumpy and foul evacuations which were produced by this plan, and in how short a time the several distressing symptoms disappeared. On its being mentioned to this patient's parents, that the disease proceeded from foulness of bowels, the opinion was rejected almost with disdain, for the greatest attention had been paid to the bowels, and in the ordinary operations on them, the appearance of the evacuations had been perfectly healthy and natural.

A young person complained of pain and swelling in the groin, and it was found that an irritating sore existed under the nail of the toe of the foot of the same side; an inflammatory state of the absorbents marked the course of the connection. A bad habit seemed thus to shew itself; purgative and other medical means were had recourse to, and the local mischief seemed to subside. The urine of this little patient was tinged with blood, but nothing occurred to direct the aim of the practitioner against any decidedly local disease. After a few days the child had severe epilepsy, the fits of which were extremely violent. Blood was taken from the head, cooling anti-phlogistic remedies were employed, and due attention was given to the state

of the bowels. Purgatives were constantly taken, and very foul and full evacuations were discharged; prodigious quantities of such stools continued to pass off, and ultimately every symptom of disease disappeared. The effects of the epilepsy on the brain, however, continued some time, but as no recurrence of the fits took place, there was ultimately a recovery. This young person's case seems to shew that many symptoms of the disease are remedial. The bad habit of body was here most probably the consequence of a want of due attention to the state of the bowels, and to an inactive state of life. A general cause acted on the whole constitution, and disorders broke forth, which pointed to the same remote cause. An imperfect circulation in the vessels in the lower body, occasions fulness and determination of blood to the head and other parts, and a venous plethora in the lower extremities is accompanied by arterial fulness elsewhere. Had the secretions of the organs of digestion been promoted, the lower circulation would have followed its healthful course, but being impeded, the balance was destroyed, and new processes commenced; thus, epilepsy becomes the consequence of bilious obstructions, or foulness and fulness of bowels. Diseases act as emunctories, and they occur when a determinate balance between the several powers of the body takes place. If the functions of the alimentary canal go on, regardless of the introduction of noxious substances, if their powers are weakened or their operations counteracted, the necessity arises for more extended re-actions over the system. Thus, after a long course of improper diet, not well digested from inactivity of life, want of exercise, and free air, much cause of mischief accumulates. This accumulation, after a time, excites a re-action in the organs of digestion, a copious flow of bile takes place, the stomach becomes nauseated, and the bowels discharge their secretions in a violent and painful manner. Such vomiting and diarrhæa prove so far curative, that they are at last roused into an action which removes and carries off the accumulated cause of mischief.

In these, as in numberless other cases, the state of the constitution, and the state of the bowels, are reciprocally affected. The disturbed state of the one causes the quiescence of the other; or, agreeably with the foregoing system, the operations to relieve the body of a morbid cause being effectual in the one, there remains no necessity for any exertions on the part of the other. It is often neces-

sary to alter the mode adopted by nature when she exerts her powers to relieve herself from an unnatural burden, as well as when she resists the introduction of any noxious agent, and defends herself against the ill-effects produced by it when it is introduced. A person had suffered excruciating pain from the passage of a gall-stone through the duct, subsequently to which there took place an obstruction of the bowels, so that no ordinary dose of purgative medicine at all availed in acting on them. Severe vomitings came on, and the contents of the bowels were brought up. The obstructed cause still remained, and all the symptoms put on the most threatening aspect. Large doses of calomel were given, and still no relief from the bowels. Two drops of croton oil joined in two pills, containing also eight grains of compound extract of colocynth were given, and repeated in four hours. Large watery stools followed the use of these pills, and at length a gall-stone of the weight of 250 grains was discharged. Relief was thus obtained, and in a short period this patient perfectly recovered. In this instance, the mode adopted by nature was ineffectual towards the cure; although it is clear that the vomitings had removed what might have caused a fatal accumulation, and prevented fresh matters from clogging up the bowels.

Another patient with precisely the same symptoms, excepting the previous pain passing the gall-stone, was treated in the same manner. But in this case no evacuation could be obtained, and the case terminated fatally. On opening the body it was found that a portion of the ileum had passed into the mesocolon, and had become strangulated.

Another case, which also terminated fatally, from the bowels being tied round as it were in the mesentery, seems to shew, that even the vomitings might sometimes be advantageously encouraged in such cases.

This patient laboured under the most formidable symptoms of enteritis, brought on by violent straining, with a costive state of bowels. Large bleedings were adopted, and all the usual remedies administered. On opening the body, it was found that the bowels were held down by a very small filament, which had been elongated and almost broken through by the vomitings. It appeared almost certain that this filament must have given way, had the vomitings continued but a little longer.

As croton oil is a very valuable medicine in cases

similar to the foregoing, I now mention a case wherein its good effects were very conspicuous. The patient was a gentleman of advanced age, labouring under the aggravated symptoms of an obstruction of the bowels. He had been freely blooded several times, and the usual remedies had been given without success. His pulse had become very quick and feeble, his face bore marks of approaching dissolution, and the abdomen was swoln and tense; in fact, the most fearful anticipations of the result were entertained by all about him. Twenty grains of calomel were given for a dose and repeated within six hours, and large doses of compound powder of scammony were also taken. Croton oil was then given in conjunction with compound extract of colocynth, and repeated after six hours. Evacuations were produced of the consistence of birdlime, of a dark slate colour. The bowels became more tractable after this matter had been evacuated, and became obedient to the smaller doses of common purgatives. After a long convalescence this gentleman perfectly recovered, and has remained in good health ever since.

The symptoms which arise in the stomach, from the slightest state of indigestion to the more aggravated form of dyspepsia, appear, according to the foregoing system, to be efforts on the part of nature against some offending causes. In these she either exerts herself in defensive operation against the introduction of various substances, or in removing the ill effects which arise after they have been introduced. Excess in either eating or drinking gives rise to these defensive and reparatory processes, which after a time restore the healthful tranquility of the organs concerned. It is easy to trace these operations when the causes producing them are obvious, as in cases arising from indulgence in eating and drinking; but, although we cannot immediately trace the cause, it is quite reasonable to suppose that symptoms of precisely a similar character should, in like manner, be destined for a purpose equally salutary to the frame, and equally defensive against impending danger. The practical advantage, therefore, of such remedies as excite similar disturbances in the stomach and bowels, and as encourage and strengthen the stomach in these her natural and curative operations, is immediately obvious.

It would be a far too extensive an inquiry to attempt an enumeration of the cases of stomach complaint which have been benefited by the exhibition of nauseating doses

of medicines of the emetic tribe, as ipecacuanha, squill, and the several preparations of antimony. The admitted use of the Bath waters, in cases of this description, proves the advantage arising from giving assistance to the languid powers of these re-active organs.

If we vary as we will the doses of the above medicines, in some cases, we cannot attain the precise action necessary to the cure of some stomach affections. It is, therefore, of importance to join other medicines with them, for the definite purpose of making them act in the proper manner. Thus, in some irritable stomachs it may be useful to join a small quantity of opium, henbane or hemlock, with the purgatives and emetic ingredients. In other cases some stimulants become necessary, as cayenne, ginger, &c. Some habits will not bear aloes, and others are peculiarly affected by rhubarb; but in all cases the cure depends more upon the actions which are produced by the medicines, than upon any specific quality in the medicines themselves. The natural and curative disturbance can be traced in many cases, and the object must be artificially to bring about that curative process, in those cases where nature is not equal to the task herself.

It appears quite inconsistent with all just reasoning on these subjects, to admit the system which has of late been much recommended of relinquishing for diet almost all vegetable food, and of substituting drinks, containing ardent spirit, for the more refreshing beverage of table beer, and the weaker mixtures of light wines.

It is true that the latter disturb the stomach more than the former, but these disturbances become ultimately more salutary; particularly if the natural re-active process, comprehended in these affections, be assisted and modified by medicines, such as those above described, and which further those actions which of themselves naturally produce a cure in some cases.

In 241 et seq. the outline has been explained of the important functions of the brain. The increased actions of the vessels of the head, the flushed countenance, and the mental excitement which follow the use of vinous and ardent liquors, point out the almost immediate sympathy which exists between the stomach and the brain. Over excitement of one organ, as well as the other, leads to debility and collapse, and a reciprocal action attends their respective functions.

The actions of these organs in a state of health, qui-

etly balance each other; and the phenomena they exhibit during our waking and sleeping hours, shew the importance of their connection towards the well-being of the human constitution. All the affections of the mind, as well as the several changes of action in the stomach, are in a mutual correspondence for the general welfare of the whole frame. When any great nervous assistance is required to forward any important animal function, blood flows towards the head in increased rapidity and quantity, to give efficacy to the required increase of nervous power. Thus, in our ordinary health, this increased nervous excitement takes place after our meals, gives us the feelings of satisfaction after we have taken the necesssary supply of food, and, by the support it affords to the nervous power, enables the constitution to complete a digestion, which is suitable to the wants of the frame, and for the restoration and reparation of its several organs. If this supply go beyond its required limits, and too much excitement be called forth, by an over supply of food or liquors, this excess becomes remedial, and corrects the injuries which might otherwise accrue from too much repletion. In the one case, the feelings of the mind are of a satisfactory character, in the other, they are painfully excited by sickness and indigestion.

All the animal functions are in the strictest connection with the operations of the nerves; they have also a mutual co-operation with each other, and admirably balance each other when they are concerned in producing the phenomena of health. The intellectual functions are also dependant on this balance; but they betray the most decided state of disturbance, whenever the animal powers are called upon to make any excessive exertion.

Old age and accumulated infirmities, were gradually bringing a respected patient towards the close of life; in whose case the influence of the bodily functions on those of the intellectual faculties, and those of the mind on the functions of the body, was clearly and decidedly demonstrated. It was evident, that the vital power was unequal to the task of keeping up the necessary powers of the animal and intellectual functions. At one time, the symptoms of intellectual failure were exhibited in muttering delirium and intellectual delinquency; at another time, large portions of the body were in a state of mortification and decay. The circumstance particularly applicable to the present part of the subject, was the

alternation that was clearly marked between the failure of the mind, and the decay of the body. When, for instance, a large part of the body became in a state of fresh mortification, the mental powers returned, and the patient was clearly sensible of all surrounding impressions. When this sacrifice had been made on the part of the body, the sinking state of the constitutional powers again disturbed the due exertion of the mind, and mental incapacity again took place. Another and another part of the body, repeatedly became mortified and gave way; and in each increase of the process of fresh mortification, new restoration was given to the powers of the mind; until at length, all the vital powers sunk in death. Life was prolonged by this reciprocal action of mind and body, and ample time was granted for many a protracted exertion of moral and intelligent application of mind.

Previous to dissolution, how often do we observe a wonderful increase of mental power; and with how much satisfaction do we often see the last moments of departing friends occupied with enjoying the illusions of delirious fantasies, and veiled from their consciousness of the awfulness of the situation in which they then are.

The success of the practice adopted and recommended by Mr. Pott, in cases of mortification, occurring in the extremities of old people, corroborates the above view of the subject. He found opium of service in arresting the progress of this state of mortification, a medicine evidently calculated to take off the exertion necessary to every mental operation.

When the intellectual faculties are not under reasonable controul, we see a great increase of bodily strength; thus, under the influence of violent passion, the body becomes capable of stupendous exertion. Even passions depressing to the mind, as the fright occasioned by sudden and unexpected accident, have induced instances of exertion, far surpassing any preconceived opinion of human strength. It appears as if at the instant, the whole vitality of the body were driven to the organs by which the exertion is made. The almost maniacal and idiotic look that overspreads the countenance, seems to shew that the intellect has passed away from its usual abode.

Disorders have been known to give way upon sudden and unexpected emotions of the mind; and persons have been observed to regain the use of their limbs, upon the occurrence of threatening danger. During also the re-

covery from many constitutional diseases, frightful apprehensions seize upon the mind of the patient, and a just self-possession of the mind is wanting in many disorders of the stomach and bowels. Fearful forebodings are an attendant symptom of dyspepsia, and the whole history of hypochondriasis is marked by the same errors of judgment. Wherever great bodily exertion is required, there is more or less an abandonment of reasonable controul; and if we dissipate the powers of the mind and body, we at the same time lose the direction of our intellectual powers. It is with the management of the mind, as with the use we make of the element of fire; kept under controul and duly made use of, the one constitutes all that is worthy and dignified in man, as the other becomes by proper attention most subservient to our wants, or by mismanagement, subversive of every beneficial result, and in the highest degree destructive and appalling. Doctrines which involve the ideas of natural efforts, tendency to cure disease, specific actions, and the like, must be admitted with great caution and under much limitation; the fact is, that all the phenomena are regulated by laws fixed and inherent in organized nature, as they are demonstrable in the varied actions of the external world. Every effort is a result, and every tendency is agreeable to the inherent actions of fixed principles. There are no specific qualities of medical agents, that are not conformable to the unerring routine of natural and fixed laws. Were we once acquainted with these principles, every result would become philosophically demonstrable.

Another very striking instance of the subserviency of the mind to the necessities of the body, occurs in epilepsy. In this disease there appears to be a total failure of the mental functions; and the violence and strength of the convulsions attending the paroxysms of this malady, seem to be in proportion to the absence of the power of exertion in the mind. If the facts were not constantly before us, we could hardly believe that such violence should occur in the animal frame, without mortally injuring the organs immediately essential to life. A strict attention, however, to the phenomena presented by this disorder, unquestionably points out many results of this process of nature very beneficial and useful to the frame, under the then existing circumstances. This disorder takes a large range through the different periods of human existence, and it is more or less under the controul of

medicine, according as it occurs early or late in life. It occurs as a transient symptom of local irritation in infancy; whilst in advanced life it forms an intractable disease, produced by causes deep seated and of an important character in the general constitution of the body.

Epileptic convulsions are excited in children by worms, foul bowels, teething, &c. and they are often the forerunners of measles, small pox, &c. They are not apt to recur after the cause producing them has been removed. In advanced life this disease is of a more constitutional character, and is often occasioned by causes, as injuries, and malformation, that can never be entirely removed.

A gentleman, whose constitution had been greatly reduced by a life of intemperance, became subject to frequent attacks of epilepsy. He was totally unconscious of the violence of the convulsions which attended each paroxysm of the disease. He had been addicted to the drinking of spirits for many years, and the habit had become so fixed, that it was with the greatest trouble he was prevailed on to relinquish a system which must sooner or later destroy his life. I attended this gentleman almost daily for five years; for his apprehensions about himself made him dissatisfied with every plan that was not immediately sanctioned by some medical attendant. He had suffered much from agitation of mind during the rebellion in Ireland, and he had taken a very active part in the military warfare which had been instituted for its suppression. Agitated in mind, continually enduring fatigue of body, and above all, indulging largely in the use of spirits, he at that time first became subject to this disease.

Although his constitution was weakened, and his frame exhibited every appearance of general indisposition, there was not discovered any symptom of organic injury or of local disease. Attention was paid to the state of the liver and the digestive organs, and every remedy of repute was scrupulously administered, to restore to the functions of these organs a healthful regularity. The state of the circulation was strictly watched; and every symptom of increased determination towards the head was obviated by general or local blood-letting. He went through a course of nervous medicines; and remedies, which are reputed almost specific in epilepsy, were unavailing in this case. He was prevailed upon to abandon the use of wines and ardent spirit; his health appeared amended, and the fits

became less frequent, but by no means less violent when they occurred.

It appeared as if the epileptic paroxysm had become necessary in keeping up the balance of his then state of invalid health. The only chance that seemed to remain of removing this frightful malady, was by thoroughly new modelling the whole system of his animal functions. It was very evident, that these fits formed a part of the series of phenomena which at that time were exhibited throughout the constitution; and if a new balance between the powers and functions of the body could be brought about, which would not necessarily involve the series of re-actions which constitutes epilepsy, we might indulge in the hope of producing at least some alteration of the symptoms. In a familiar conversation with this patient, it was suggested that, as by the manner in which he had gone on through life, the functions of the organs of his frame had deviated from their healthful character, it might be of service to him were he to recommence life and pass through the plans adopted in infancy. This patient adopted a milk diet, and totally gave up animal food, and all fermented liquors. The strictest attention was paid to the state of the bowels, and their emunctorial powers were gently but effectually brought into action. He very soon perceived the advantage of this course; the epileptic fits became much less frequent, so that for three years before his death they had entirely left him. For a short time before his death he had surreptitiously returned to the use of spirits, which soon brought on a liver complaint, of which he died. The faculties of the mind are totally suspended during an epileptic paroxysm, and the mind resumes its power after the interruption of the epileptic attack, without any apparent intermission in the subject entered on previously to the convulsive seizure.

It must be in the recollection of many an Oxonian, how uniformly a celebrated professor resumed the demonstration of a problem after having been interrupted in the course of it by an epileptic fit.

A gentleman, whilst reading the newspaper in the Upper-Rooms at Bath, fell from his chair in an epileptic fit. Assistance was immediately called, when he was blooded from the arm, and the temporal artery was opened. A dose of senna, salts, &c. was also administered. He was conveyed home and placed on a bed on the floor of his parlour. In this situation he remained four hours insensi-

ble, and convulsions of so violent a nature continued to attack him, that it was thought that his constitution could never withstand such violent shocks.

After an action had taken place on his bowels his reason returned. The first question he asked after his recovery, was "what was the news?" evidently shewing that his mind had been a perfect blank during the whole time of the seizure. He was so much exhausted by the violence of the disease, that he soon shewed symptoms of dropsy, of which malady he died in about a fortnight after the first attack. He had no further return of the epilepsy. It would be of no use to cite other instances of epilepsy, to prove the fact that during the existence of the tremendous convulsions that occur in that disorder, the mental faculties in a great degree, if not totally, and on all occasions, give way.

The great increase of strength which is displayed by delicate females during the paroxysms of hysteria, shews a strong example of increased bodily power occurring during the delinquency of the intellectual faculties.

In typhus fever, previously to the occurrence of delirium, a patient is reduced to a state of the greatest debility; on his becoming frantic, it requires the combined strength of several people to restrain the violence of his exertions.

If the subserviency of the mind to the necessities of the body be an established fact in pathology, we shall soon see its importance in elucidating many of the phenomena which are constantly occurring in the symptoms of disease.

It would be impossible to explain many of the most common phenomena of the human frame with any degree of satisfaction, if we did not admit this reciprocal action of the intellectual and bodily powers. The whole series of actions which attend common drunkenness, could not be explained without adverting to the disturbance which so constantly occurs in the intellectual functions. The effect of great stimulation and excitement must be collapse and debility. In drunkenness, the very excitement produces that delirious state of mind which imparts a power to the bodily functions. Stimulated as the stomach is by fermented liquors, it would soon become the seat of intractable disease, where it not relieved by the countervailing action of other organs. The brain is equally affected with the stomach, and its induced change of operation is a protection to the organ first excited. The increased

circulation of blood to the head supports the nerves in the new process of strongly obviating the evils which threaten the animal powers, during the progress of inebriation.

A provision is made in all these general processes of the constitution against an excess of either a determination of blood to an organ, or of excitement. Were there not this provision there would be danger of an over fulness of the vessels of the head, and a consequent over excitement of the brain; as soon, therefore, as it arrives at a certain point, the stomach is sympathetically called into action, and the offending cause is forcibly ejected.

It may be here remarked, that an acquaintance with the mere structure of the human frame can carry us but a little way towards the knowledge of the wonderful operations which the living machine is continually performing. The same nerve has an infinity of attributes according as it is more or less supplied by the circulation; and the local and general force of the blood-vessels depends on the varied excitement of the attendant nerves; so that new balances are perpetually occurring, and the same system of nerves and blood-vessels exhibits an endless variety of functions. The eye of the anatomist cannot be at all aware of the infinity of purposes which one and the same organ or vessel of the frame is capable of performing; it is only by attentively examining the qualities of the machine when in action, that we can deduce the purposes it has to answer.

The recovery from a state of over repletion, wherein there has existed very great excitement, is marked by many very striking facts of the utmost practical use in the due consideration of the symptoms of disease.

The white state of the tongue marks a certain balance in the functions of the organs concerned, from which we may be pretty certain of predicting an early and favourable termination. The state of the stomach and digestive organs, indicated by the furred white tongue, is most practically favourable to the cure of constitutional affections.

It is a mark of recovery when the tongue changes from a dark, dry, and almost black state, to a white appearance in fevers of the putrid kind; and the white appearance now spoken of announces recovery, when succeeding to the red, glossy, and ulcerated surface of the tongue of patients labouring under aphtha.