Hempel (C. J.)

ON

ECCLECTICISM IN MEDICINE:

OR,

A CRITICAL REVIEW

OF THE

LEADING MEDICAL DOCTRINES.

AN INAUGURAL THESIS,

PRESENTED AT THE

NEW-YORK UNIVERSITY

ON THE FIRST OF MARCH, 1845,

BY

CHARLES JULIUS HEMPEL, M. D.

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TO

PROFESSOR MARTYN PAINE, M.D.

Dear Sir,

An inquiry into the leading medical doctrines has seemed to me the fittest subject for the dissertation which the rules of the University require a candidate for the profession of medicine to present as his inaugural thesis. I take the liberty to address these pages to you as an acknowledgment of the pleasure and the advantage which I have derived from the study of your works and from your lectures. The earnestness with which you stand by your principles in medicine, has inspired me with the deepest confidence in your impartiality, and has convinced me that the great object which you have constantly in view in teaching the Institutes of medicine, is, not only to educate the professional conscience of your hearers, but also to excite in their hearts that desire of self-judgment and self-determination without which no practitioner of the healing art can realize the beau ideal which I have formed to myself of a good physician, that of being a lover of truth and of suffering humanity.

It cannot appear strange to you, sir, that, in the study of medicine, I should have pursued the same mode which I have pursued in the study of philosophy and theology. It is the nature of my mind to inquire into all things that constitute—to use an expression of the illustrious Vico—the *scibile* of all knowledge. The principle which old Terentius has expressed in the verse, "Nihil humani a me alienum puto," and the still more weighty precept addressed by the Scriptures to all thinking minds, "Prove all things and hold fast to that which is good," have constantly actuated and shall ever actuate my mind in all literary and scientific pursuits.

The candidate for the medical profession, unless he be endowed with the happiest powers of discrimination, and with a common sense which has constantly stood triumphant above the assaults of prejudice and which the experience of practical life has sharpened, cannot be expected to leave his "alma mater" with firmly-established views on the various important ques-

tions which the treatment of disease involves. The science of medicine cannot be studied in a couple of years, and the great Boerhaave, after having spent an eventful life as the most distinguished physician of his age, is said to have left behind him the advice, that it would be best for any one to have nothing to do with doctors, provided he keeps his head and his feet dry, eats and drinks moderately, and regulates his bowels.

All that a man who studies the healing art as a philosopher and a lover of truth, can be expected to accomplish during the period of initiation, is, to acquire a knowledge of the medical doctrines which now claim the attention of the profession. And every well-organized university should give him abundant opportunities for their investigation. If medicine were constituted as a mathematical science, he could not fail to acquire an immoveable basis for his treatment of disease; but when he sees the medical profession divided into sects that combat each other with unrelenting opposition, and often with bitter enmity, what else can he do, except to take cognizance of the contending principles, to examine their respective claims, and, after calm and impartial reflection, to decide for himself like a man and a Christian?

The books which treat of the healing art, are so filled with idle and mischievous speculations and contradictory doctrines, that the study of medicine is a study of contending assertions rather than a study of harmoniously-united truths and practical precepts. "Fever is nothing but debility," teaches one school; "fever is nothing but inflammation," inculcates another; "fever is a morbid state of the intestines," says another: one is giving wine while another is drawing blood; and some, disgusted with such empiricism, or deterred by such opposition, leave nature to herself, believing with Rutty, that "those who are left to God's providence and cold water, have the best chance of recovery."

What rational treatment can the beginning practitioner of medicine adopt, if guided by the contradictory, speculative and fanciful definitions of the many diseases to which the human organism is liable? You remark very justly in your Commentaries, that you "consider it utterly chimerical to attempt an explanation either of the modus operandi of the morbific cause, or of the nature of the morbid changes; and that we can only say that a morbific cause exists, and that there are certain phenomena which denote a primary lesion of the vital forces of the solids." And yet the great body of the medical writers are tenacious of speculating upon the causes of disease and constructing their therapeutic principles upon fanciful hypotheses.

Look at the various definitions which have been offered of

delirium tremens. Armstrong regards it as a venous congestion in the brain and liver, consequent upon the activity of the heart and arteries increased by irritation; Playfair derives it from a morbid state of the liver and the intestinal secretions; Goeden finds the seat in the solar and cœliac plexuses, and regards the affection of the brain as simply sympathetic; according to Clutterbuck, it is the consequence of inflammatory action in the arachnoid and pia mater; Hufeland believes that it is only a passive nervous delirium; Stokes says there are two kinds of delirium tremens, one consisting in diminished irritability, the other in increased excitement. Upon this doctrine of Stokes, you comment critically in your article on venous congestion.

Is it astonishing, in the presence of this mass of contradictory and futile speculations that the great and philosophical Bichat should utter these rebuking accents on the profession of his choice? "To what errors have not mankind been led in the employment and denomination of medicines? They created deobstruents when the theory of obstruction was in fashion, and incisives, when that of the thickening of the humours prevailed. The expression of diluents and attenuants were common before this period. When it was necessary to blunt the acrid particles, they created inviscants, incrassants, etc. Those who saw in diseases only a relaxation or tension of the fibres, the *laxum* and *strictum* as they called it, employed astringents and relaxants. Refrigerants and heating remedies were brought into use by those who had a special regard in diseases to an excess or a deficiency of caloric. The same identical remedies have been employed under different names, according to the manner in which they were supposed to act. Deobstruent in one case, relaxant in another, the same medicine has been employed with all these opposite views; so true is it that the mind of man gropes in the dark, when it is guided only by the wildness of opinion."

And then he thus contemptuously and deridingly speaks of the profession which he has ennobled with his great talents and brilliant exertions in the cause of science: "Hence the vagueness and uncertainty our science presents at this day. An incoherent assemblage of incoherent opinions, it is, perhaps, of all the physiological sciences, that which best shows the caprice of the human mind. What do I say? It is not a science for a methodical mind. It is a shapeless assemblage of inaccurate ideas, of observations often puerile, of deceptive remedies, and of formulæ as fantastically conceived, as they are tediously arranged."

Surely, when a man of great genius such as Bichat, entertains such a common opinion of the present state of medical

science, the young practitioner fulfils a duty towards himself, by making himself acquainted with the various doctrines which now constitute the science of medicine. Wo unto him, who, in medicine, admits the principle, "in verba magistri jurare;" he is inevitably doomed to mediocrity and comparative uselessness. As for my own part, I never could nor would resign the independence of my mind. I have now breathed for ten years the spirit of American institutions, and this period has sufficed to make me both capable and desirous of warming my soul with the Promethean spark, and enjoying the exalted freedom of an earnest seeker of truth.

CHARLES JULIUS HEMPEL.

New-York, March, 1845.

ECCLECTICISM IN MEDICINE.

The medical profession may be said to be divided into four different schools, all of which are more or less opposed to each other. These schools are, 1, the Vitalists; 2, the Humouralists; 3, the Homœopathists; 4, the Chemical Physiologists. These different schools I shall review in the order in which I have enumerated them here.

Among the *Vitalists*, the learned Professor of the Institutes is, in this country, one of the chief leaders. The vitalists hold the distinguishing doctrine that the functions of the animal economy are the result of a peculiar vital force inherent in the different organs and tissues of the organism, and that the morbid influences which produce that abnormal condition of the vital principle which we designate by the term "disease," act directly upon the solids. In this respect they differ completely from both the humouralists and the chemical physiologists, the former of whom cause all diseases to originate in a vitiated state of the blood, and the latter of whom consider the different functions of the animal economy as results of chemical and physical action.

The vitalists, in their treatment of disease, proceed upon the principle, that in any peculiar form of disease an impression must be made upon the vital principle for the purpose of causing it to react with the necessary force in order to conquer the invading disease. It is upon this principle that the operation of bloodletting, of cathartics, of emetics, &c., is justified and advocated by the vitalists. They let blood not for the purpose of evacuating a vitiated fluid, but for the purpose of making such an impression upon the capillaries, and, through them, upon the central organ of the circulation and the cerebral mass, as will restore the equilibrium of the circulating fluid. They give an emetic not for the purpose of evacuating bile, but in order to make such an impression upon the acini of the liver as will restore the harmonious functions of this organ; and, if they administer a cathartic, their object is not to free the bowels from accumulated excrementitious matter, but to excite their vital force into that state of activity which will enable the languid intestinal canal to perform its inherent functions.

There can be no doubt but that the law of reaction is a fundamental law in the animal economy, and that it is at the very basis of all rational and successful treatment of disease. We know this from daily experience. Great relaxation is often followed by obstinate constipation. If we plunge a burnt limb into cold water, the pain may be alleviated for a moment; but in a few minutes already it will considerably increase. The application of opium to a diseased tooth, after a moment's alleviation of the suffering, has often been succeeded by the most excruciating pain. The law of reaction is so well established in the minds of the practitioners, both by experience and philosophical reasoning, that no medical man would dare violently to interfere with a spontaneous diarrhœa, or a spontaneous hemorrhage, lest he should concentrate the force of the disease, and cause it to break forth with redoubled vigour, as soon as the restraining influence of the remedy shall have lost its power. And even in cases where the continuance of those morbid conditions would become dangerous, he acts with great caution, and checks their career not directly, but indirectly, by making, by appropriate remedies, such an impression upon the vital force of the capillaries or the walls of the intestinal canal, as will induce them, naturally and without force, to resume their normal functions.

Surely this practice is eminently philosophical, because it is agreeable to nature. When the humouralist sees in the human organism nothing but a stable of Augias that requires constant washing and sweeping in order to be kept clean, the vitalist views it as a living mechanism whose harmony rests upon physical nature as its ultimate basis; and when this harmony has been disturbed in such a way as to allow the chemical forces of nature an overpowering influence, he restores it not by clearing away imaginary obstacles which the humouralist supposes to exist in the circulatory fluid or the various secretive processes. No, he knows that the disease is an impaired activity of the vital force itself, and it is this vital force itself which he tries to rescue from its embarrassed condition.

Hence, in the hands of the vitalist, the operation of bleeding and the various processes of artificial evacuation are not *objects* but *means*. He resorts to them as means of causing the depressed vital force to react against the invading disease.

The *principle* which is involved in this mode of action is eminently rational. It leaves the medical practitioner free to act agreeably to what he conceives to be Nature's dictates, and never entangles his mind in the cobwebs of the speculative necessities of theories.

Armed with the principles of the vitalist, I bleed, not because

I see putrid or otherwise vitiated blood coursing through the veins, but, because the inflamed state of the circulation indicates to my mind a peculiarly-depressed condition of the vital force of the circulatory organs, which I rouse again to its genuine and harmonious action by depressing it a little more, just as a sinking body, overcome by the law of gravitation, will bound up from the ground by being forced against it with an additional quantity of depressing power.

The principle upon which the vitalist acts, leaves the medical practitioner free to inquire into the propriety of his usual modes of treatment. Because he has bled to-day, this is for him no reason why he should bleed to-morrow, even though the disease were similar. Bloodletting, in his hands, is a mere means of causing the vital force *to react;* it is this peculiar impression upon the vital force which is the great object he desires to attain; hence, by virtue of his principles, he is left free to inquire, whether bloodletting is the most appropriate means of producing the desired impression.

The illustrious Rush, who is so justly surnamed the American Sydenham, was independent enough of established doctrines to dare to entertain the idea that there is no absolute impossibility of bloodletting being some time superseded by an adequate remedy. "In reviewing the prejudices against bloodletting in consumption," says Rush,—which he calls an excellent remedy in that disease, "I have frequently wished to discover such a substitute for it as would with equal safety and certainty take down the morbid excitement and action of the arterial system. At present we know of no such remedy; and, *until it be discovered*, it becomes us to combat the prejudices against bleeding, and to derive all the advantages from it which have been mentioned."

Habit and education may make the medical practitioner familiar with the operation of bleeding; but, standing as I do upon the threshold of the temple of Æsculapius, I must be at liberty to feel that it is no trifle to inflict upon the organism, voluntarily and designedly, the great loss of blood which is demanded in some inflammatory diseases. And I feel confident that the young philosophical practitioner is entitled to the cheering hope, that all violent operations upon the human organism will be abandoned, when medicine shall have truly and fully become a Christian science and shall rest upon a principle, the application of which to the treatment of existing forms of disease will suffer no exceptions in its comprehensiveness and delicate regard for the system.

What I have said of bloodletting, applies with equal force to the operation of cathartics, emetics, &c. If I give an emet-

ic, it is not with a view of evacuating bile, but in order to produce such an impression upon the secreting organ of the bile as will restore the harmony of its vital functions. Or, in giving a cathartic, my object is not to produce simply an evacuation of excrementitious matter, but to make such an impression upon the vital force of the intestines as will restore the harmony of their peristaltic motions and the absorbing functions of their lacteals.

The inquiry whether such an impression can be produced without violently affecting the organic viscera, is a perfectly legitimate inquiry. Celsus was right in defining the character of a philosophical cure of disease by *cito*, *certe*, and *jucunde*—quick, certain, and sweet. If we consider disease and the organism as two enemies struggling with each other, upon which of the two should fall the blow of the physician? Surely not upon the organism. From the moment the physician gives his remedy, if it be the true remedy, the organism should feel relieved and should give itself up with pleasure to the influence of the remedial agents.

The formula which so many physicians have constantly upon their lips, "Let the system feel the action of the remedy," evinces a most dangerous and reckless carelessness.

The poor system! Is it not sufficient that it should have been invaded by unrelenting disease? Is not the system, so invaded, entitled to the most delicate care of the physician? Is it not the most sacred duty of the doctor to employ, as much as possible, such a mode of cure as will free the system from the enemy without doing violence to its already weakened and exhausted powers?

Why do not physicians act like Christian philosophers and lovers of truth and progress? In no department of knowledge is conservatism worse than in medicine. What do most physicians care for enlightening their minds after they have received their diplomas at the university? Most of them study their profession for the sake of a livelihood, not for the nobler and truly Christian purpose of benefitting their suffering brethren, and availing themselves of the light which the wisdom of gifted minds and the increasing progress of science are continually shedding around us in brilliant rays, for the purpose of simplifying the methods of cure, and protecting the organisms of the existing generation more and more against the deleterious effects which remedial agents, if improperly and incautiously administered, may incidentally exercise upon the system.

Far different from the spirit with which most men, and unfortunately too most physicians study their profession, did the

immortal Schiller conceive the beau ideal which every student of wisdom should constantly keep in view. In his opening discourse as the newly-appointed Professor of History in the University of Jena, he draws this parallel between the true lover of wisdom and him who studies a profession for a mere livelihood. "As carefully as the money-seeking savant isolates his science from other sciences, does the philosophical mind endeavour to enlarge its sphere, and to restore its union with other sciences — *to restore*, I say, for it is the abstract understanding that has separated them. Where the money-seeking savant disunites, the philosophical mind unites. He has soon become convinced that in the spiritual as well as in the physical world, all things join into each other; and his intense desire for union cannot be satisfied with mere fragments. All his efforts tend towards completing the formation of his conscience; his noble impatience does not rest until all his ideas are arranged into an harmonious whole, until he has reached the centre of his art, of his sciences, from whence he reviews them to their ultimate boundaries. New discoveries in the circle of his activity, which are discouraging to the money-seeking pedant, delight the true student of wisdom. They form perhaps a last link in the series of his ideas, which is completed by these discoveries. And even if it were torn by them; if a new phenomenon, a newly-discovered law of Nature dashed the whole structure of his knowledge to pieces: he has loved truth more than his system, and he is at once willing to relinquish it for the sake of a newer and more beautiful form. Yea, if no blow from without, shakes the arrangement of his ideas, then, stimulated by an ever-stirring desire of improvement, he is himself the first to recombine anew the series of his ideas in order to make it more perfect. Through ever new and more beautiful forms of thought the philosophical mind arrives at more exalted excellence, whereas the money-seeking pedant guards the barren sameness of his dogmatism in the desolate and silent rest of his understanding."

I cherish the doctrine of the vitalists because it leaves the inquiring practitioner the fullest latitude of investigating for himself the true relation existing between disease and the healing power of remedies. Remedies should constantly be prescribed in the spirit of a true vitalist. If we administer cathartics or emetics we should administer them with a view of making an appropriate impression upon the vital force; and we should constantly try to obtain this impression in such a manner as to leave the system unharmed by the inherent subversive action of the remedy.

The law of adaptation which is a fundamental principle in the

philosophy of vitalism, makes it especially incumbent upon the medical practitioner to act upon the principle which I have expressed in the foregoing paragraph.

The law of adaptation is beautifully exhibited in every part of the animal economy. Every organ in the animal economy has a special destiny to accomplish, and, by its structure and its relation with other parts, it is admirably fitted for the performance of its peculiar functions. The bladder secretes the urine and stores it up, uninjured by the fluid, whilst a single drop of it, which may have escaped perhaps into the thigh in the operation of lithotomy, will invariably produce gangrenous inflammation. Air may pass in and out through the larynx and may spread itself in abundance through the parenchyma of the lungs; but in an inflammation of a joint let a little air pass into its cavities through a punctured bursa mucosa, and a most horrible emphysema will result from this intrusion, and the life of the distressed patient, distended like a sort of balloon, is in imminent jeopardy; or let air enter into some opened vein and the death of the patient is almost certain. Why is bile inoffensive when enclosed within the thin walls of the gall-bladder, whilst it becomes a deadly poison when injected into the circulatory apparatus? Why does venous blood with its volume of carbonic acid course through the veins in perfect harmony, whilst in the arteries it would result in a stagnation of the vital functions? The ear-passage may hold a considerable quantity of wax without irritation, whilst a foreign body would excite an inflammation in the delicate coating of its walls. Here there is adaptation between the containing and the contained, the preparing and the prepared substance.

But the law of adaptation does not only extend to the nature of those substances, it is equally applicable to the quantitative relation existing between the vessel and its contents. There is as much bile in the gall-bladder, as much urine in the bladder, as much blood in the circulatory vessels, as much excrementitious matter in the intestinal canal, as much wax in the ears, as those organs are capable of holding in that peculiar state of their vital activity. Each organ is to determine what its contents shall be and how much of them there shall be. If this quantity could be increased or diminished by the arbitrary regulations of man, he would necessarily possess the power not of regulating but of arbitrarily controlling the organic life. Such a power cannot exist; Omnipotence himself cannot interfere with the operations of those causes that result from the eternal and unchangeable principles of his wisdom.

The law of adaptation is as true in the morbid as in the normal vital conditions of the animal economy. Its operations in

the morbid state of the system have been lucidly and beautifully shown by the learned Professor of the Institutes in his treatise on humoural pathology. After having shown why morbid blood, as in malignant fever, should excite disease when injected into the cellular tissue of an animal—because there is no adaptation of one to the other and it therefore acts as a local irritant—he continues: "What we have stated in regard to the progressive adaptation of the blood in diseases to the existing alterations of the vital properties of the solids, and that, however varied the condition of the former, it does not become an aggravating cause of disease, is founded in an all-pervading law of the animal economy. We have shown its operation in the normal state of its organization, and we see it every where illustrated in diseases. Various morbid secretions, which are offensive to the parts producing them in their healthy state, are innoxious to the same parts during their generation of the morbid products. And again, although these morbid secretions act with violence upon sound parts, as soon as the latter are brought into a morbid state, corresponding with that by which the virus was generated, the irritant is no longer hurtful. The surface which produces the syphilitic virus, or that of the small pox, etc., is not offended by its presence; and yet, when applied to the abraded skin in its healthy state, it soon excites inflammation. But this, in its turn, assumes the suppurative condition, when it is no longer irritated by the offending cause; but, on the contrary, the vital forces may obtain an ascendency, throw off the enemy, and return spontaneously to their natural state. Had it been otherwise, nature would not have been true to herself, since the process would have been unceasingly destructive."

These beautiful and eminently philosophical remarks suggest to me serious and important reflections on many existing modes of treatment. They lead me to inquire: If this great law of equilibrium pervade all the functions of the animal economy in their normal as well as their abnormal condition, is it just, is it philosophical that we should deprive an organ of the results which it has worked out as the support of its peculiar state of vitality? If there must be this equilibrium between an organ and the results of its vital force, is it not true, that, by depriving the gall-bladder of the bile which is the necessary support of the peculiar vital condition of the organ, we excite the liver into an unnatural secreting process in order that the gall-bladder may receive the supply adequate to its peculiar vital state? And not only do we commit this devastation upon an unoffending organ, but we increase the virulence of the morbid condition of the gall-bladder itself, since it will now claim with an increased vigour, and guard with a more intense anxiety, the fluid

which it considers the legitimate support of its peculiar vital condition. And is it not the same with the intestinal canal, with the bladder, with the circulatory apparatus, and with the dropsical fluid?

There are three principles which make up the unit—man: passion, the intellectual principle, and the physical powers. Our ethical philosophers try to teach us that man may realize any relation he pleases between those principles. Be this so or otherwise, in the functions of the organic viscera his power of changing the harmonious relation of cause and effect, does not exist. If the organic viscera are affected with a peculiar morbid condition, it will manifest itself by corresponding phenomena; if man destroy those phenomena they will immediately be reproduced with a renewed intensity, with this difference, that, whereas in the natural development of the disease those phenomena constituted visible symptoms affecting the skin or the muscular clothing, they now spread over the inner surfaces with a view, as it were, of shielding themselves from the invading action of man, thus concentrating their forces upon the hidden and more delicate organs, and making the destruction of the animal functions an almost inevitable necessity.

What suggestions of vital importance does the law of adaptation furnish us in regard to exanthematous diseases? Does it not teach us that we ought to respect the external phenomena of the disease, which have received, as it were, the disease into themselves and have thus become the guardians of organic life? Does it not teach the physician that in exanthematous diseases, be they ever so insignificant, he ought to dread the application of all salves and lotions which have a repelling power, and that he should beware how he considers the disease cured when it has been merely removed from the skin? How many thousands of patients have been killed by having had eruptions upon the skin, in scarlet-fever, in typhus, and in the various forms of ulcers, repelled into the system? A spontaneous hemorrhage, a diarrhœa, may have been curative symptoms, which should have been suffered to run to a spontaneous termination, when behold, the ruthless hand of an ignorant practitioner arrests their benign course and converts them into a fatal disease.

And even in many surgical diseases, what does the law of adaptation suggest in reference to the established modes of treating them? True, we tear a polypus from the nose and, by doing so, we often cure the disease, because a polypus has little or no vitality. But is a surgical operation a rational method of curing hemorrhoïds? Suppose we tie them low down, will they therefore remain away, or will they reappear

higher up? They will rise higher up, and become more dangerous and troublesome in consequence. An encysted tumour, or a lypomatous excrescence of the adipose tissue may be extirpated by the knife, because they contain little or no vitality; but does the law of adaptation sanction this violent mode in treating cauliflower excrescence of the womb or tumours which are not evidently adventitious growths and therefore deprived of vitality? The illustrious Professor of Surgery has related the case of a lady who had a little tumour upon her chest and whose children were desirous of having the tumour exsected from her person. The tumour was an external vicarious embodiment of some internal disease; for, as soon as the tumour had been removed, the internal disease became fatal almost instantaneously.

When I thus review in admiration the important philosophical suggestions to which the law of adaptation gives rise, I cannot help being amazed that its application to the treatment of all existing forms of disease should not have been rigorously and scrupulously inquired into.

Armed with the glorious truth of this law the question with a medical practitioner ceases to be, to remove the bile, to evacuate the bowels, to lessen the amount of the circulating fluid; but simply to make such an impression upon the morbidly affected viscera of organic life, as will restore the harmony of their individual functions and their universal relations.

The philosophy of vitalism, though it seems to be based upon a noble and rational view of the functions of the animal economy, is far from being universally recognized as true. It is opposed by many different doctrines among which we may especially notice the doctrines of the mechanical, microscopical, anatomical, humoural and chemical physiologists.

The learned Professor of the Institutes combats these different doctrines with great force, and, I beg to be permitted to add, with great success. In this opposition he is powerfully seconded by all leading vitalists, especially Hunter and Bichat.

The *mechanical*, *microscopical* and *anatomical* schools err especially in this that they mistake results for causes, and that upon this fundamental confusion they construct their systems of cure. Their therapeutic views may be said to be identical. It is especially in their theories of inflammation and congestion that those schools differ from the vitalists. Those morbid symptoms in the circulatory apparatus, which the vitalists refer to a morbid condition of the vital force of the vessels, the mechanical school considers results of physical obstructions in the circulation of the blood. Serum and lymph, arising from inflammation, are merely a mechanical exsudation from the blood. Pus is supposed to be a component part of the blood

and to make its escape in a purely mechanical manner. Mr. Earle, who is one of the most consistent advocates of the mechanical school, has illustrated the mechanics of inflammation in the following manner: "Would it be a matter of astonishment" he says, "if the several parts of a fluid like the blood, upon being pressed through an excessively fine sieve, were to come through in the order of their fluidity; that is, the finest and most fluid first, and the largest and coarsest last?"

Professor Paine has put this hypothetical illustration to the test of experiment. But he found that "every species of the finest texture was permeable by the serum, and admitted, also, the passage of the red globules."

Berzelius says that they pass readily through filtering paper.

But suppose that the exsudation of serum and the formation of pus are a mechanical process, can you, upon mechanical principles, restore those parts to the blood, and, in this way, prevent the farther decomposition of this fluid? What causes the blood to be decomposed? Is there not a morbid action going on in the vascular system? Can you prevent this morbid action by mechanical means? Remedial agents must act upon the forces which produce disease; an analysis of the results of morbid action does neither show us the nature of those forces, nor the mode in which they can be and ought to be acted upon.

Bœrhaave, one of the great lights of the mechanical school, accounts for inflammation by his theory of "*error loci*." He supposes that a part is inflamed in consequence of stray globules of blood which have been arrested in the capillaries; it is to this excess of blood in the capillaries that he ascribes the great heat which may be felt in inflamed parts.

Celsus has indicated redness, swelling, heat and pain, as the four leading characters of inflammation; but if the explanation that Bœrhaave gives of the nature of inflammation, were correct, it seems to me that the temperature of an inflamed part should be less than the common temperature of the body. It cannot be supposed that blood which is severed, as it were, from the circulation, and is therefore more or less deprived of the influences of those forces which maintain the animal life of the economy, should be as warm as the fluid circulating in the arteries. Indeed, in mortification, which, according to Hunter, is one of the terminations of inflammation, and which, being the ultimate and highest development of inflammation, should exhibit the greatest amount of heat, the limb is often icy cold. If phlegmonous inflammation depended upon the capillaries of an inflamed part being clogged up with an excessive amount of blood, we might justly conclude that the temperature of the body should not only rise in proportion as we approach the central organ of

circulation, but that this rise should be distinctly perceptible. We know that there is sometimes an increase of temperature of from 20 to 30 degrees, but the system is unconscious of this difference, though it is infinitely greater than the difference existing between the temperature of an inflamed part and the same part in its natural conditions of vitality.

And we now also know to a certainty that the characters which Celsus ascribes to inflammation, do by no means embrace all the varieties of that morbid condition. Cloquet, Béclard, Louis and Bichat, assert that red vessels have never been detected in the tunica arachnoides, even when the membrane has offered every other proof of an inflammatory affection. Hunter affirms the same thing of the brain. Dupuytren considers the white gangrene and the gangrena senilis an inflammatory affection of the arterial capillaries; and the learned Professor of the Institutes tells us that, upon this principle, Dupuytren restored a patient "comme par enchantement," by drawing blood from the arm. The hands and feet were the seat of the affection. The fingers and feet were blanched, of an icy coldness, wholly insensible, immoveable and dry as parchment. This "white gangrene" is also particularly noticed by Dr. Graves, as resulting from inflammatory action. Louis affords abundant proof that a part may be inflamed without being red. In his "Researches on Phthisis," he says, that "paleness of inflamed structure takes place sooner or later, as is exemplified in the various shades of colour of the hepatized lung." "It ought to be noticed," he says, "that continuous with a red and softened portion of mucous membrane, we often find another equally softened, but without redness. If the first, therefore, be inflammatory, it is probable that the other is also." Professor Gross considers scirrhus, tubercle, ulceration, softening, to be, invariably, the results of inflammation.

The *microscope* has been a powerful ally of the mechanical school. Armed with the microscope, the eye of the physiologist has boldly and perseveringly searched the intimate structure of organs; and upon the facts which the microscope had revealed, have often been erected theories explanatory of important vital functions and the nature and origin of diseases.

Some of the most distinguished physiologists have been constantly opposed to the use of the microscope in physiological investigations. Bichat and Hunter condemn it as being untrustworthy. It seems to me that the desire of investigating the inmost structure of parts is legitimately inherent in the minds of physiological anatomists, and I, for my part, do not feel authorized to condemn it. But what is highly condemna-

ble is, to erect a system of therapeutics upon such microscopical discoveries. The inmost operations of the animal economy no mortal eye is permitted to behold. And, fortunately for us, it is not necessary that we should know the nature or the modus operandi of the vital force in order to cure disease. I confess, and I suppose every body else will be willing to confess, that I am perfectly ignorant of the use which a knowledge of the intimate structure of organs may afford in the treatment of disease. What avails Kiernan's description of the liver in the treatment of bilious fever? Does it teach us how the bile is formed, or how we can retard or hasten the secretion of that fluid? Again, what matters it in a practical sense to know that the human ovum is a perfectly spherical body about the one hundred-and-twentieth part of an inch in diameter; that it consists of a thick but very transparent coat which surrounds the substance of the yolk; that within the yolk is situated the germinal vesicle of Purkinje about the seven-hundred-and-twentieth of an inch in diameter, and within that the germinal spot of Wagner about the two-thousand-five-hundredth or the three-thousand-five-hundredth of an inch? These apparently wonderful discoveries which have been realized by means of untiring labour and research, do not shed a single solitary ray upon the great problem of conception and the development of the incipient embryo: still far less do they reveal to us new modes of treatment in the diseases of the uterus, the ovaries, and the other organs connected with gestation and parturition. Will the knowledge which we possess of the intimate structure of the kidneys aid us in the treatment of diabetes, or of retention of urine? Whether we adopt the opinion of Malpighi that the granules in the pyramids of the kidneys are simple bodies, or whether we believe with Ruysch that each granule constitutes a glandular group, when we come to the bedside of the patient we shall then feel, that our microscopical anatomy is a lifeless science, and we shall feel tempted to admit with Bichat "that we ought to neglect all these idle questions in which neither inspection nor experiment can guide us; that we ought to begin to study anatomy where the organs can be subjected to the senses; and that the exact progress of the sciences in this age is not accommodated to these hypotheses which made general anatomy and physiology a frivolous romance in the last."

Among the ridiculous doctrines to which the pretended discoveries of the microscope have given origin, the doctrine of the animalculæ deserves a special mention. Thanks to the microscope, we now not only know that this globe probably is nothing but a huge pile of carcasses of insects, but it has been even discovered that the process of fecundation is probably ef-

fected by a spermatozoon. According to Messrs. Dumas and Prevost a spermatozoon fecundates the corpuscle of de Graaf, as this is met by the former on passing through the fallopian tubes into the upper cavity of the uterus. But does this theory, which, disgusting as it is, is seriously proposed as explanatory of the process of conception, show *the mode in which* the human ovum is fecundated by the spermatozoon? It is seriously proposed that advantage should be taken of the existence of spermatozoa in legal medicine for the purpose of discovering whether rape has been actually committed. Absurd and even dangerous speculation can hardly be carried farther.

Another of these wonderful productions of the vermine kingdom is said to be the cause of the itch; it is called the itch-insect. Linnæus describes it on the authority of others. Adams tells a story about the itch-insect which the professor of the Institutes has thus transcribed into his "Physiological Commentaries." "An old woman" says Adams, "who had consulted me for her niece, found no difficulty in detecting several of these insects; but in vain I endeavoured to trace the appearances by which she was directed. My friend Bangor, whose patience in every investigation of natural history infinitely exceeds whatever I have met with, even in professed naturalists, was, for the most part, as unsuccessful." Adams finally caught the itch himself, as he well deserved; "when," he says, "I applied to my old woman who readily drew two ouçoes from my arm, but not from the vesicles. She constantly answered to our inquiries, that where the bladder was formed, the ouçoes had left the spot." Adams at length found that the ouçoes only burrowed in the hardened pimples. It is manifest that they are nothing more than an indurated secretion which precedes the serous stage of the eruption; which accounts for the old woman's philosophy that the ouçoes always leave the bladders. Adams states "that the late Mr. Hunter, in his lectures and conversations, always acknowledged that he could never discover the itch-insect, and went so far as to suspect that the opinion concerning its existence was derived from a preconceived theory, and supported by credulity."

Has that insect ever been seen anywhere else except in the itch vesicle or the hardened secretion? Why should not measles, scarlet fever, small pox, and all other exanthematous diseases owe their origin to a similar animalcule? Why should the itch become a fatal disease when it is repelled upon the inner surfaces? *It is an eternal law, that diseases which can be repelled upon the inner surfaces have their origin, not in some local action upon the skin, but in the inmost depths of the vital forces.* The itch has never formed an exception to this law.

The distinguished Schœnlein doubts very much the existence of the itch-insect; but even if it exist, he regards it merely as a morbid product resulting from the peculiar morbid action which the itch-virus exercises upon the skin. How can it be imagined that an invisible entozoon, should, by its sting or bite, produce that horrible itching upon the skin, the improper treatment of which often gives rise to a fatal disease? And how do we explain that one individual among many should have been chosen by those entozoa as an object of their assaulting fury? Whence do they obtain this power of discrimination; and whence, above all do they come? For there must have been many who committed the attack, and those many must have been united like a band of depredating enemies.

The *numerical method* is another mode of determining the respective value of remedial agents. This method has lately been introduced in France under the auspices of the celebrated Louis.

The numerical method is strongly objected to by the learned Professor of the Institutes upon the ground that numbers may lead astray as easily at least as generalizations deduced from the carefully collated facts of conscientious and judicious observers.

This method is equally objectionable upon the ground that numbers may be erroneously stated by careless observers, and that many numerical statements are results of wholesale trials in hospital practice, which cannot possibly be regarded as fair indications of the relative merits of one method of cure over another. An illustration of such trials is furnished in the report from the French Academy of Medicine, made by Messrs. Andral, Louis, Bouilland, and others, upon the purgative treatment of typhoid fever, which had been so exclusively recommended by Larroque. The commission physicked one hundred patients without the slightest regard to symptoms, age, sex, or stage of the disease. They bled another hundred upon the same plan; and with another hundred they adopted "une méthode à-peu-près expectante."

Another instance of this kind of wholesale practice is furnished by the illustrious Zimmermann: "I know," he says, "a certain Æsculapius who has fifty or sixty patients every morning in his antechamber. He just listens a moment to the complaints of each, and then arranges them in four divisions. To the first he prescribes bloodletting; to the second, a purge; to the third, a clyster; and to the fourth, a change of air."

Such wholesale practising is an opprobrium to the medical profession, and is too much practised even at this distant day. Purging, vomiting, bleeding, and sweating, are even now the leading operations of medicine in the hands of the great num-

ber of both licensed and unlicensed physicians. And "bark and wine" is yet looked upon as the great harbinger of strength. It is the Brunonian philosophy measuring the quantity of the remedy by the higher or lesser degree of excitability of the system. Nothing but the crassest empiricism, the most reckless and brutal abuse of the human organism. With its high and varied susceptibilities, the inmost nature of which is completely hidden from our minds, each organism being created to embody a peculiar and perfectly distinct form of beauty and harmonious life: this masterpiece of the Infinite God, the reflex of his infinite wisdom and power, falls a victim to the ignorance of a licensed murderer.

The *anatomical school* numbers among its members some of the most brilliant minds of the medical profession. The object of pathological anatomy is, to investigate the structural lesions consequent upon disease. Considered in itself, this investigation is an interesting business; but I do not think that a knowledge of the lesions which disease will produce in certain organs, can shed much light upon the treatment of such diseases. Pathological anatomy has shown us that certain inflammatory diseases of the lungs will terminate in the hepatization of that organ, or in the formation of tubercle. Are we better informed of the treatment of tubercular phthisis since we know its devastating effects and have even analyzed with great care the tubercular mass?

Pathological anatomy reveals to us the effect, not the causes of disease. What is generally called the pathological cause of a disease, is in fact nothing else but the aggregate of its internal phenomena. "It has been the folly of a great many upon dissecting a corpse, to take the part that was most affected to have been the cause of a person's death, when it was only the consequence of a disease which might have been cured if the original cause had been at the first considered. Thus, dropsy is invariably ascribed to a disease of the liver by some, and by others to the brain, stomach, mesentery, spleen, kidneys, because they saw some one of these parts mostly affected. And so again, a fever is generally ascribed to a dry, thick blood, because they find none but such in the veins, whereas these accidents are produced by the greater or less violence of the disease."

Mortification of the extremities is said to result from an ossification of the coats of the arteries; but what is the ossification itself except one of the phenomena by which the disease manifests itself?

Retention of urine is, by some, supposed to result from an excessive distention of the bladder. Surely, when that vis-

cus is excessively distended, the contracting energies of its encircling muscular fibres are considerably diminished. But why was it that the urine should have accumulated in the bladder in such an unnatural quantity? Why did the bladder cease to be stimulated to the expulsion of its fluid after it had passed into the bladder in the necessary quantity from the pelvis of the kidneys? Must not the walls of the bladder have been morbidly affected before the urine was permitted to accumulate in excess in its interior? I understand very well that the phenomena of disease should be related to each other in a certain order, and that one may result from the other through a principle of sympathy and a law of growth. A morbid enlargement of the uterus may induce a sympathetic swelling of the mammæ and a secretion of milk; a morbid condition of the stomach may give rise to a headache; prolapsus of the womb or of the bladder may cause mucous discharges from the vagina. If morbid anatomy can, by its analytical investigations, shed light on the course which a disease pursues and on the order in which the symptoms of a disease are related to each other, it may become a powerful auxiliary to the science of cure. But anatomy is too much inclined to construct medical theories upon structural lesions; in conjunction with its new ally, pathological chemistry, it exposes us to the dangers of imagining that the difference existing between an organ in its healthy and its morbid state, is the disease from beginning to end, that the disease originates in a mere physical abnormal metamorphosis of the different tissues, and may be cured by physical action. This belief has indeed carried away the humoural philosophers so far as to make them assert that in pestilential fevers and the malignant cholera saline medicines are the best remedies, "because the blood in those diseases is black, and muriate of soda, magnesia, or chloride of sodium restore the bright arterial colour of the blood in the crucible of the chemist."

Pathological anatomy is, nevertheless, an interesting form of science and a most legitimate object of human research. I am confident that it has to fulfil ends which we are not yet aware of. If we consider that we are yet perfectly ignorant of the functions of some of the most important organs of the animal economy, the sympathetic nerve, the spleen, the thyroid body, and most parts of the brain, we have no right to impose restrictions upon the desire which may animate our minds of investigating the various modes in which the operations of the organism are carried on, or the results which they may realize either in the normal or abnormal states of the economy. General anatomy itself is as yet in many respects a lifeless science. We devote hours and pages to the description of a single bone,

like the sphenoid; our works on anatomy teach us all the ramifications and terminal branches of the arterial and venous trunks, and show us the course of the nerves, even of their smallest filaments; and this display of science requires great expenditure of time and labour; but would any impartial anatomist pretend to say that a complete knowledge of general anatomy is necessary to be a distinguished surgeon, or eminently useful and enlightened practitioner of the healing art?

But shall we therefore pronounce the study of the human organism unnecessary? or shall we not rather consider the human organism a riddle, the solution of which will teach us the true principles of all those institutions that concern man's liberty and happiness; government, commerce, education and social life? Indeed it is upon physiological facts that all psychological theories should be based. Do we not know that all the functions of organic life are intimately related to the play of the passions? that digestion, respiration, circulation and secretion are either favoured or injured by the workings of the passions? Do we not eat more heartily and plentifully in the society of cheerful and sympathizing companions than in the narrow circle of the family and under the excitement of our daily business? Do not grief or anxiety deprive us of our appetite, or interfere with the process of digestion? And may we not ask ourselves in view of this complete independence of the organic life of the body from the will of man, whether the organic life of the soul, its sensitive and impelling principles do not enjoy a similar independence from the *direct* influence of the will, and whether we are not bound to regulate this life in the same way as we regulate the organic life of the body; *not by imposing upon it an order which it rejects, but by inquiring into its own genuine laws and permitting it to expand agreeably to the regulations which constitute its true and harmonious order?* And lastly, if we apply the Cousinian doctrine of the will,—that man, while he is stimulated by some motive to the performance of a certain act, can perform an action diametrically opposed to the one intended,—to the fact of muscular antagonism, do we not find that physiological truths give the lie to such metaphysical speculations, and that man can no more be simultaneously governed by two antagonizing motives, than two antagonizing muscles can act at the same time—the quadriceps extensor femoris extend the leg upon the thigh and the biceps flexor cruris relax it? A philosophical practitioner cannot study medicine simply for immediate purposes. The study of medicine is for him a means of becoming a minister of nature, and, in whatever direction he may turn his attention, he sees doctrines, principles and institutions which he appropri-

ates to himself as elements of the science of man and stepping-stones to goodness and wisdom.

The *humoural school* rests upon principles which are totally opposed to the philosophy of vitalism, and which, in its results, must cause just as much destruction of human life as truly philosophical vitalism discloses means to save it.

Humouralism abounds with absurd definitions, foolish inferences and pernicious modes of treatment.

According to the humoural pathologists, all diseases originate in a vitiated state of the blood. Andral, who may be regarded as one of their most celebrated leaders, lays down the universal principle, "that the blood is first vitiated by the commixture of deleterious substances; that its usual appearance leaves no room to doubt its being altered in its nature, and that it is the vitiated blood which usually affects the solids." Hence the great object of the physicians of this school is, to give such medicines as will, according to their supposition, act upon the blood." "I am satisfied," says Dr. Hosack in his correspondence with Dr. Stevens, "that in malignant fevers, the disease can only be cured by the proper use of those medicines that possess the power of acting upon the blood, and that prevent or remedy its diseased condition."

The contamination of the whole mass of blood is accounted for upon the principle of fermentation. "A little leaven leaveneth the whole lump." This fermentation in the living body is called "the *silent* fermentation, as having some laws peculiar to itself; as opposed to that which takes place in the open air or under other circumstances." But "analogies," says the elegant Professor of the Theory and Practice, "are mighty slippery things." The analogy which humouralists suppose to exist between the fermentation going on in the open air and the so-called silent fermentation of the blood, as well as between the putrefaction of dead matter and their so-called *vital* putrefaction, is founded upon fancy much more than upon reality. There is no such thing as putrefaction in the living body; and the whole doctrine of putrid fevers, which is a doctrine of the humoural school, is the result of a most pernicious delusion. Putrefaction invariably results in the evolution of nitrogen and carbonate of ammonia. But carbonate of ammonia never exists in a free state in the system, and only begins to be evolved from the urine two or three hours after it has been exposed to the action of atmospheric oxygen.

It has been shown by physical experiment that the doctrine of fermentation, or the contamination of the whole mass of blood by the absorption of the morbific poison, is fallacious. According to Müller, it takes at least from one minute to a minute and

a half for any substance to be absorbed and distributed through the system. How shall we reconcile this fact with the instantaneously fatal action of certain poisons upon the organism? Acetate of morphia has produced its effects in one minute, prussic acid in a second; the vegetable poison "tshettik" with which the savages of Java poison their arrows, has caused instantaneous death with the most horrible symptoms of tetanus.

On the other hand there are instances where the morbific poison has been dormant in the system for months and years. The poison of hydrophobia has often manifested its fatal symptoms several years only after the wound had been inflicted. And in many chronic diseases the morbid diathesis has skipped a generation, reappearing again in the grand-children. Surely physical Nature nowhere exhibits a similar mode of fermentation.

Humouralism is on a par with the anatomical school in this respect that it confounds effects with causes. "Pus," for example, says Dr. Hosack, "produces a peculiar form of fever, called hectic fever; and this, I believe, is the only way in which hectic fever is ever formed." Mr. Gulliver considers pus the proximate cause of "sympathetic, inflammatory, sympathetic typhoid and hectic fever." Now, it is not true that what is called healthy or laudable pus gives rise to hectic fever; every body may have seen pus intermixed with the healthy granulations of a wound without a trace of hectic fever being perceptible in the system. But suppose there is hectic fever in conjunction with the formation of an unhealthy pus, why would we not consider both these morbid phenomena results of one and the same morbid action in the system? Why would we consider the fever as a mere development of the action of pus, when we know that the pus itself is the result of a morbid virus with which the system has been tainted?

A host of objections can be raised against humouralism, objections which must appear unanswerable except to those whose personal vanity and interest are involved in the maintenance of the humoural doctrines.

The mode of treatment which humouralism proposes, is, on the face of it, absurd. Dr. Stevens maintains that "the red colour of the blood depends on the presence of its saline constituents, and that, when deprived of them, this fluid is black." Hence the practice which is proposed to restore them to the blood is, to give saline medicines. This practice is absurd. There is no reason why the externally introduced saline substances should not be expelled again much more easily than the original saline particles were, which were essential constituents of the blood, and united to it in their very inmost essence. And

then, the muriate of soda does not act upon the blood coursing through the system, in the same manner as it does upon the blood out of the system. *Out* of the system, blood saturated with chloride of sodium forms a saline mixture; but when has the blood *in* the system ever obtained a saltish taste, even after a sufficient quantity of salt had been swallowed to impart its taste to the whole mass of blood?

Dr. Mitchill, in order to free the blood from the acids which have blackened it by depriving it of its saline constituents, recommends the use of "all such compounds of other bodies, with alkaline bases, as are capable of being decompounded by the septic poison or acid they meet with in the human body, and of furnishing an alkali to unite in such cases with those sour and acrimonious fluids, and thereby to saturate them." Dr. Mitchill considers the human body a mere chemical laboratory, where chemical action and reaction can be carried on the same as in the crucible. But there is one small circumstance which Dr. Mitchill has left out of consideration in his recommendation of the use of alkalis, it is this: that the acids with which the blood is saturated, are not the result of chemical agency, but of a morbid action of whose origin and present condition in the system we know nothing; and that no chemist can determine the influence which that morbid action will exercise upon the chemical relations existing between the alkalis and the acids. It is just as probable that the vital force will prevent the reaction from taking place as not; and even if it did take place, new quantities of acid would be constantly formed with this difference that the morbid cause, by having been violently deprived of the results of its action, and being itself left unrestrained and continuing to act in perfect freedom, will have become exasperated, and will not only restore the loss it has suffered, but will produce an additional quantity of the deleterious acids, since acids there are.

If the phenomena of disease depend upon a contamination of the blood, how does humouralism account for the periodical quiescence in intermittent fevers? Senac, after describing the terrific symptoms which attend "malignant intermittents," remarks, that a person inexperienced in the disease would scarcely believe it possible for the patients to rise again. But, strange to tell, at the termination of the paroxysm these terrible symptoms abate, and oftentimes entirely disappear." Does not this show that the blood cannot be the exciting cause of the disease?

How do humouralists account for the cotemporaneous existence of diseases in the system: for instance, smallpox and measles, of which Dr. Russell has reported two cases; or scarlatina and small pox, as reported by Hufeland? Here, accord-

ing to the doctrine of humouralists, the blood must have been contaminated in two different ways at one and the same time.

How does humouralism account for tetanus arising in consequence of punctured wounds in the sole of the foot, or of surgical operations? Or how does it account for the sudden changes of colour in the hair and skin from violent emotions of the mind?

How does it account for local swelling and pain, and for metastasis? Has the infection of the blood any thing to do with an exanthematous eruption being repelled and spreading over the inner surfaces?

And lastly, how shall we, upon humoural principles, account for the effects from mechanical injuries, such as compression of the brain? How shall we, upon those principles, account for a sick headache arising from disturbed digestion, or for a point in the side from over-running, for mortification arising from cold, or for the sudden death consequent upon drinking cold water while the system is in a state of great heat? Some people often get a violent inflammation of the throat from substituting a thin cravat for one of more weight. An alteration of the circulating fluid has nothing to do with the phenomenon. Nor has it any thing to do with difficulty of breathing, lumbago, sciatica, wryneck, dysentery, nor any of those diseases in which particular organs seem to be principally affected. The normal state of the blood depends indeed upon the harmonious action of all the organs of the body. If their vital functions are deranged, the blood, even if it retained its genuine unaltered condition, would nevertheless minister to disease by furnishing to each special organ the fibrinous material out of which the organ is to construct itself. But it is not in the blood that the disease is first excited. To admit such a fact is shocking to common sense. The blood is a mere result of the united vital action of all the organs; it is absolutely dependent upon that action. How then is it possible to suppose that while this action is unimpaired, it should not have the power to resist any morbid changes taking place in the blood, a fluid which is completely and absolutely a mere result of the organic life of the system, which is absolutely dependent upon the instruments of organic life, and which has itself just so much power and life as the organic viscera impart to it? When we see these viscera differ essentially in their constitution; when we see them endowed with the power and entrusted with the office of performing distinct functions; is it not rational to suppose, that the morbid alterations to which those functions are liable, depend, all of them, upon special causes just as much as the vital activity of the organ does in its normal state? We speculate about the nature and the origin of

disease with as much assurance as though we knew all about the nature and the origin of life. And yet we know nothing, absolutely nothing, of the operation of final causes. And I will even go farther, and say that we know absolutely nothing of the operation of final causes in the results of our most simple physical experiments. I throw potassium upon water; it ignites. I know that potassium has so strong an affinity for oxygen that it will take this substance even from water and set the hydrogen on fire. This explanation satisfies my mind; but it only explains the evolution of certain results. What is hydrogen? What is it in its inmost essence? No one can tell anything about its inmost constitution except that it is an inflammable elastic something, and that we drink it in the shape of an oxide. Truly does the distinguished Liebig remark, "that the formation of a crystal, of an octohedron, is not less incomprehensible than the production of a leaf or of a muscular fibre; and the production of vermilion from mercury and sulphur, is as much an enigma as the formation of an eye from the substance of the blood."

I quote these expressions from Liebig in order to show that even in the opinion of great chemists, the operation of first causes is completely hidden from our sight. What Liebig says about the formation of an eye from the substance of the blood, I can only understand in this way, that the creative force which originally formed the eye, maintains the integrity of this organ by assimilating to its substance those constituents which the blood is able and destined to furnish to all the organs of the animal economy.

The human organism is indeed a unit; but it is a most complete unit, distinguished into parts that exist amongst each other in harmonious alliance, but each of which fulfils a special destiny and exhibits a most various form and structure. Not only is it not absurd, but it is even eminently philosophical to suppose that the forces which create the living organism, constitute just as harmonious and complete a unity as the organism itself does; and that they establish such relations among the viscera of organic life as to secure an individual existence to each, and to make the integral existence of each dependent upon the harmonious relations of all.

May it not be the office of the sympathetic nerve to preserve this harmony among all the viscera and organs of the animal economy? The organs of the animal economy cannot be exempt from the moral law of respecting each other's rights, of knowing the precise limit to which they may use their inherent vitality without interfering with the rights of their associate organs? May it not be that it is the function of the sympathetic

nerve of whose mysterious agency almost nothing is known, to be the great watchman of the respective rights of the different organs? May it not be the office of the sympathetic nerve to establish and to preserve a system of mutual responsibility among the different organs? And while the motor and sensitive nerves preserve the individuality of the different organs, may not the sympathetic nerve be destined to watch over their harmonious alliance? May we not infer the *moral* office of this nerve from the fact that it is neither a nerve of motion nor sensation, and that even wounds may be inflicted upon it without the animal suffering any pain? It is certainly not absurd to suppose that the solar plexus whose branches are irradiating from their central body like rays from the sun, should have been placed behind the stomach and should send its various plexuses to the abdominal viscera for the purpose of regulating their assimilating power *in reference to each other.*

The language to which humouralism has given origin in professional treatises and which it has engrafted upon the public mind, is replete with gross and unmeaning technicalities. "Among physical people," says Mr. Hunter, "we find such expressions in common use, as, the humours are affected in the blood; sharp humours in the blood; the whole humours being in a bad state; the whole blood must be altered, or corrected; and a variety of such expressions *without meaning;* they even go so far as to have hereditary humours, as gout, scrofula, etc., and make us the parents of our own humours, saying that we breed bad humours. Accidents or even the application of poultices, have been supposed to bring bad humours to a part, because the part in which the accident happened, or to which the poultice was applied, would not readily heal. Humours are even supposed to gravitate to the legs slowly; and, in short, *the whole theory of disease has been built upon the supposition of humours* in the blood, or of the blood itself being changed. I cannot conceive what is meant, unless it be, that strong susceptibility to a specific disease exists; as, smallpox may bring on scrofula, or a strain, the gout."

What are sensible people to think of a profession that has given birth to such an unmeaning "jargon," which betrays the crassest ignorance of the nature of disease, and a disgusting mania to establish therapeutic principles upon absurd and dangerous speculations? Some of the most shining lights of the profession have made themselves guilty of these violations of common sense. Bœrhaave, for instance, admits some forty different kinds of scurvy, all of them speculatively arising from forty diseased states of the blood. "One tells us," says Beddoes, "that the blood is *polluted;* another, that it is *contaminated;*

a third, that it is *acrid ;* a fourth, that it is *putrescent*, without ever recollecting that to employ terms expressive of phenomena, such as the senses may recognise, and to reason upon such phenomena alone, are indispensable conditions in philosophizing."

It is not to be wondered that the medical profession should have furnished the great satyrist Molière a theme for one of his most admirable comedies.

Even at this moment when common sense seems to have more sway over the multitude than has been the case at any time previous, the humoural doctors find means to practise upon the ignorance of the public, and to gather fortunes by their gross deceptions, and their pernicious assaults upon the delicate robe which enshrouds man's immortal spirit.

What do these Brandreths and these Thomsons with their beastly conception of the operations of the vital force, know about disease and the laws of cure? All they care for is to minister to the brutish taste of the multitude that is yet crawling in the polluting mire of materialism, and, despite of the refining influences of Christianity and art, views the body as a mere *material* machine, performing *material* functions, and liable to the visitations of *material* disease.

And agreeably to the notion of disease being some material miasm which has introduced itself into the recesses of the system, one advises that it should be drawn out again by the blood, another by the skin, a third by the bladder, a fourth by the intestines, a fifth by the salivary glands, all of them forgetting that the substances which they introduce into the stomach as remedial agents, make an inroad upon the vital energies by being acted upon by the assimilating power of the organism as nutritive substances are. But what do the great exertions of the organism result in? The tissues refuse to receive the deleterious poisons of the doctor as component parts ; hence these tissues are forced into a resistance that wears them out, lays them waste, weakens their vital activity, and instead of diminishing the force of the disease, secures its supremacy over the system.

Material disease, we may consider wounds, ruptures, chemical poisoning. But an inflammatory fever, a schirrus, a fungus hematodes are not the results of *physical* influences. They are the results of influences of an order analagous to the order of the vital principle itself. They are dynamic conditions, morbid modifications of the vital forces of the economy, and cannot be drawn out of the system as you draw one material body out of another. In surgical operations we are required to proceed with the utmost gentleness and caution ; and if it be necessary

to use more than common force, we never act until we are sure of the very point where the blow is to be struck. Only in the affections of organic life we deem ourselves authorized to offer violence to the system, and to shake it to the very centre in the foolish expectation that the ultimate result of this horrible subversion will be the restoration of harmony.

The *homœopathic school* has been founded by the German physician Hahnemann. Hahnemann was an intimate friend of the distinguished Hufeland, and was considered by his fellow-practitioners an ornament of his profession. The uncertainties and the inconsistencies with which the practice of medicine seemed to him replete, sickened his mind so much, that he resolved to abandon the exercise of his profession, and to secure a livelihood by translating medical works. In translating Cullen's Materia Medica, he was struck by the fact that Cullen recommended cinchona bark as a tonic, and a specific against intermittent fever. Hahnemann immediately resolved to try the action of this drug upon himself, and to his astonishment, he found himself in a little while affected with all the symptoms of fever and ague. This discovery led him to establish in his own mind the following propositions :

1, That the so-called tonics are in their essence debilitating ; and that they strengthen the system simply by causing the depressed vital energies, by means of an increase of depression within conservative limits, to react against the depressing cause ; and

2, That the pathogenetic effects of remedial agents in a healthy system, are indicative of the disease which these agents are capable of curing.

Hahnemann and his friends have inflicted upon themselves endless sufferings by trying upon their own persons the effects of the various mineral and vegetable poisons, and by dint of great perseverence and privations, have succeeded in indicating with great minuteness the virtues of some three hundred remedial agents.

Agreeably to my habits of independent study, I have investigated the doctrines of Hahnemann alike with those of all the other leading men of our profession. I may briefly arrange them here in the following series of propositions.

SERIES I.

Man is in relation with outward nature.

This relation is either *essential*, or *accidental*.

By *essential* relation, I mean a relation with those things or substances of nature, which are necessary to the preservation

and progressive development of man's essence, both the material and spiritual organism.

By *accidental* relation, I understand a relation with those substances of nature which are pernicious to man's essence, and the continual influence of which would finally destroy his organism.

To the former series belong all the nutritive, or otherwise useful animals, plants, minerals, etc.

To the latter belong the non-nutritive, poisonous or otherwise hurtful animals, plants, minerals.

For the sake of convenience, I shall designate the former substances by the term "*harmonic*," and the latter by the term "*subversive*."

SERIES II.

Every created being exists for some use or good purpose.

The truth of this proposition has been universally demonstrated by science.

It is moreover established in the Scriptures: "And God saw every thing that he had made, and behold, it was very good."

Hence, there must exist an essential or good relation between man and all the things of nature, even those substances which I have designated by the term "subversive."

The criterium of the goodness of a relation existing between man and a natural substance, is the increase of health, strength, and beauty, which man derives from the use of that substance.

Hence, there cannot exist any *essential* relation between a subversive substance and the human organism in equilibrium or health, on account of this equilibrium or health being infallibly destroyed by the contact with subversive substances in sufficient quantity.

Therefore, if there exist at all an *essential* relation between subversive substances and the human organism, it must be when the equilibrium of the latter is *disturbed*.

Indeed, experience proves that there *is* an essential relation existing between the human organism in a state of disturbance and the subversive substances.

That relation fulfils all the conditions of an *essential* relation: it *preserves* the human organism, it *develops* and *perfects* it.

In other words, that relation restores the organism in disturbance to the original conditions of health.

That restoration having been accomplished, the *essential* relation between the human organism and the subversive substance ceases to exist.

Henceforth, if the relation between the human organism, restored to its original conditions of health, and the subversive substance were to continue, this relation from an *essential* would become an *accidental*, or *subversive*, and the original conditions of health would again be destroyed.

It seems natural to conclude that this second destruction of the original conditions of health will be indicated by the symptoms of the previous or a similar disturbance reappearing in the organism.

SERIES III.

I have said that all living organisms hold certain relations to external nature.

Certain stomachs require certain kinds of food; certain temperaments require certain degrees of temperature; certain muscles are adapted to certain kinds of motion.

If such fixed relations exist between the things of nature and the organism in health, they must exist so much more necessarily between the things of nature and the organism in disturbance.

Hence there must exist an *essential* relation between each peculiar disturbance of the system and the subversive substances.

How is the essential relation existing between a peculiar disturbance of the organism and a subversive substance to be determined?

As a state of health is perceived by certain indications, so does a disturbance manifest itself by an aggregate of peculiar symptoms.

All subversive substances produce in a healthy organism disturbances, each of which is characterized by peculiar symptoms.

Each subversive substance must therefore necessarily be in *essential* relation with the disturbance which it is capable of producing in the system; in other words, it must be *more closely*, or *more essentially* related to that than to any other disturbance which is different from its own.

Hence any given disturbance in the organism is in *essential* relation with the subversive substance which is capable of producing an analogous disturbance in the healthy organism.

And as the ultimate result of any *essential* relation between a subversive substance and the organism in disturbance is the restoration of that organism in disturbance to its original conditions of health, it follows again from the preceding proposition, that any given disturbance in the organism is *cured* by administering remedies, the pathogenetic effects of which in a healthy

organism are similar to the symptoms by the integrality and the relation of which among themselves the disturbance is indicated.

SERIES IV.

I have distinguished the natural substances with which man is in relation, into *harmonic* substances, or such as develop the organism out of itself; and into *subversive*, or such substances as lead to the destruction of the organism.

I have farther shown that the subversive substances can only be in essential relation with the organism, when the latter exists in a state of disturbance, and when the symptoms by which this disturbance is indicated, are analogous to the symptoms which the subversive substances are capable of producing in a healthy organism.

I have also remarked that any *essential* relation which is *practically established* between a natural substance and the organism, will result in harmoniously developing, or beautifying and perfecting the organism.

It is evident that by an essential relation being *practically established* between a natural substance and the organism, nothing else can be understood except the introduction of the substance into the organism.

Let us now proceed to inquire how, according to the homœopathic doctrine, this developing and perfecting of the organism is effected by subversive substances.

SERIES V.

Every spiritual or material substance or state is created according to its order.

This order constitutes *the form* of that substance or state.

This form is essential to and inherent in the substance or state and cannot be imposed upon another substance or state, without violating their essential existence.

The natural or essential order of the organism is *health.*

Hence disturbance, or a deviation from the natural conditions of health is not the natural or essential order of the organism.

Disease, therefore, in the organism, is not in its order; in other words, the organism is not the natural or essential form of the disease.

Hence again it follows that the disease must have a desire—a tendency, to leave the organism, which is not its true, its essential mode of existence or form.

What then is the natural or essential form or order of existence of a disease?

SERIES VI.

I have shown above that disturbances in the organism are *essentially related* to the subversive substances, or in other words, that natural or dynamic disturbances in the organism are closely similar to those which subversive substances are capable of producing in a healthy organism.

Such disturbances being developed out of the subversive substance, it necessarily follows that the subversive substance *contains* them.

The subversive substance may therefore be said to be the material measure, type, or form of the dynamic or vital disturbance.

It is therefore the natural mode of existence of the disturbance, its essential *form* or *order*.

Hence the disturbance will desire and endeavour to return to its natural or essential order of existence, when that order is brought within the reach of the disturbance.

The subversive substance being that order, it is brought within the reach of the disturbance by being introduced into the organism.

After being introduced into the organism, the subversive substance receives the disturbance into itself.

The dynamic disturbance thus materializes itself in its type or esssential form.

This materialization of the disturbance takes place altogether voluntarily on the part of the disturbance.

It farther takes place without affecting the organism, provided the subversive substance has not been introduced into the organism in too large a quantity to exert its inherent influence upon the organism subversively, in other words, to poison it.

In proportion as the process of materialization goes on, the vital force of the organism is enabled to return to its normal state, and to regain its control over the organism.

The organism then begins effectually to *react* against the materialized disease.

When the process of materialization is completed, that *reaction* becomes entire, and it results in the disease—as concentrated or materialized in its form or type—being ejected from the organism.

The doctrines of Hahnemann have been persecuted in Germany with an unmitigated rage, and, for aught I know, they have met every where with the most vehement and bitter opposition. I am rather astonished at seeing members of our profession condemning and vilipending each other without often any one knowing any thing about the other's creed. This

injustice has been liberally practised towards Hahnemann. Though he was confessedly a man of unbounded erudition and sterling character—the great Jean Paul Richter designates him "this rare double-head of genius and erudition,"—yet the vilest names have been profusely lavished upon his devoted head. This is wrong. It is indiscreet to speak about things that we know nothing of, but it is immoral and unchristian to pronounce condemnation upon them from mere prejudice. I have vowed that this shall never be my course in the exercise of the medical profession.

Whatever may be said of the mode in which Hahnemann applies his doctrines to the treatment of disease, it cannot be denied that he has furnished most valuable contributions to physiology and hygiene. He has shown conclusively,

1, What are truly nutritive and non-nutritive substances;

2, That the speculative doctrines of humouralism about final causes are just as foolish and pernicious in the treatment of disease as a careful observation of the external phenomena of disease is useful and philosophical.

3, That a single remedy, if carefully selected with a view of making the proper impression upon the depressed vital forces, can do and will do more good than all the compound fabrics of the humoural philosophers.

4. That medicines should be so administered not only as not to excite any disgust, but to make them positively palatable to the patient. This is of the greatest importance, as the effect of the most valuable remedies is often greatly injured by the disgust which those remedies excite, and by the opposing idiosyncracies which they call into play; and

5, That remedies which have been carefully selected and are perfectly adequate to make that impression upon the vital forces which is required for the cure of a given disease, need not be given in such large doses as will taint the system with the inherent poisonous effects of the remedial agent.

Who would have thought, a few hundred years ago, when a single prescription often contained a hundred, and even a hundred and fifty, or a hundred and seventy different remedies, that we should simplify our prescriptions as much as we have done, and cure dysentery with one twentieth of a grain of calomel, and scurvy with lemon-juice?

I doubt whether the magnitude of a dose of medicine in a given case of disease will ever be rigorously determined by a scientific formula. The learned Professor of the Institutes indeed teaches in his treatise upon bloodletting, that, under certain circumstances, we must not draw a single drop of blood either too much or too little; but it seems to me that the tact

and the judgment of the practitioner must be the rule by which the magnitude of a dose in a given case of disease is to be measured. I am confident, however, that the high susceptibilities of the system are overlooked by a great number of practitioners, who are much more intent upon making a physical impression upon the system than to select a remedy with that scrupulous care which will secure it a safe and triumphant impression upon the disease.

Dr. Paine has interspersed his "Commentaries" with a great many facts illustrative of the high susceptibility of the system. It may not be amiss to mention a few of them here.

Fear has suddenly changed the black colour of hair to gray.

Hodgkin relates, that Rostan states an instance where the skin of a female, who had been condemned to the guillotine, became black in consequence of the shock. The colour was formed by "the deposit of pigment in that part of the tissue in which its presence is natural in the dark races of mankind."

Caldwell inquires whether any thing passes from the orator, the musician, the poet, the warrior, etc. into the blood of the multitude, when they rouse the heart into tumultuous action.

Armstrong, in his lectures on acute and chronic diseases, vol. ii. p. 111, says, that "when typhoid patients are apparenting dying, they will often recover from that state by the stimulus of pleasant impressions upon the mind."

Boyle, in the first volume of his philosophical works, relates an instance where a quartan was cured by a fright from a rat; and again, where the gout, and an obstinate case of scarlatina, were suddenly removed by a paroxysm of fear. In two other cases, whitlows were removed by putting the finger into a cat's ear.

Baglivi says, in his practice of medicine, "as many diseases depend upon a little cause, which may be even invisible, and may not have been introduced into the organism, nor even seem to exist, so are many considerable diseases cured in a moment, without any apparent evacuation."

The fearful convulsions to which infants are liable during the period of dentition, are at once relieved by lancing the gums.

Dr. Frank, senior, describes a quartan, which resisted all possible drugs for several months. The patient was cutting a dens sapientiæ. The gum being lanced, the ague was seen no more.

Mr. Boyle relates that the bare scent of a dose of physic operated better upon a young gentlewoman, than it did upon her sister, who took the medicine.

Dr. Pfeil, when he wanted a purge, would go into an apothecary's shop, where purging electuaries were preparing, the

scent whereof would work as well with him as a dose of medicine.

A woman used to purge herself with beef broth, but having broke her leg, used no other cathartic than the scent of it.

Mr. Lemery states, that he knew two people that purged and vomited in a most violent manner, after being confined some four or five hours where there was a large quantity of damask rose.

The chewing, and picking at the nose of some of my fellow-students, has often produced ptyalism in me for more than an hour.

A small phial of the "otto of rose," although nearly hermetically sealed, will send its perfume over a large space for many years, without any apparent diminution of its contents.

A single drop of kreosote has not only increased the flow of urine, but changed its colour to black and other hues.

Dr. Paine says, that he knows a lady in this city, who is always purged by shaking in her ears a box of pills, which is sometimes employed for this special purpose.

He also knows an apothecary, who is invariably salivated by rolling with his fingers some half dozen blue pills.

Dr. Madden was purged by rubbing over his hands a solution of tartarized antimony.

"We know," says Dr. Paine, "that a grain of calomel will cause the saliva to flow in torrents long after the administration of the poison."

"We know," says again Dr. Paine, "that bad forms of fever have been cured by mercury, when the constitutional effects of the poison were scarcely perceptible in the gums."

The principle upon which Hahnemann's system rests, is expressed by the formula: "similia similibus curantur," like cures like. It is upon this principle, that the school of Hahnemann explains the cure of certain forms of diarrhœa by rhubarb; of nausea and vomiting, by an emetic; of confluent smallpox, dysentery and the cholera infantum by mercury; of scurvy by citric acid; of burns by the application of heat; of chilblains by the application of cold; of itch by sulphur; of marsh intermittents by cinchona; of hemorrhoidal flux, hemoptysis, hematuria and epistaxis by millefoil (Hoffmann, Stahl); of gripes of the stomach connected with uneasiness and great agitation by jalap; of dropsy-like, œdematous swelling by sambucus niger (Boerhaave, Sydenham); of pleurisy by squills (De Haen, Wagner); of spasmodic asthma by ipecacuanha; of certain ophthalmic diseases by euphrasia (Murray, Lobelius); of slow nervous fevers with decreased temperature of the body, depressed sensibility and a great diminution of the vital powers by camphor, (Huxham, Cullen); of painful ischuria by cantha-

ides (Forest, Young, Huxham); of syphilis by mercury; of certain forms of intermittent fevers, with violent drawing and tearing in the bones, and tearing headache, by arsenic; of cancerous ulcers by arsenic; of chorea and epilepsy by copper (Boerhaave, Cullen); of obstinate constipation by lead in the shape of the so-called saturnine pills, etc.

The idea of "like curing like," has been broached by physicians of old and modern times. The great Haller has adverted to it. In the book "on the relations of medicines to man," which is attributed to Hippocrates, we read these remarks: "διὰ τὰ ὅμοια νοῦσος γίνεται, καὶ διὰ τὰ ὅμοια προσφερόμενα ἐκ νοσεύντων ὑγιαίνονται;—sick people are cured by remedies producing analogous diseases. And again: διὰ τὸ ἐμεῖειν ἔμετος παύεται; vomiting is cured by vomiting."

The Professor of Midwifery looks upon this latter principle as an eminently true and practical principle, and recommends his class to cure the nausea in chlorosis agreeably to this principle, by administering sulphate of zinc.

The illustrious Professor of Surgery, in his interesting lectures on tetanus, has several times lauded the principle now under consideration.

The celebrated Danish physician Stahl expresses himself as follows on the use of remedies: "The received method in medicine of treating diseases by opposite remedies—that is to say, by medicines which are opposed to the effects they produce, is completely false and absurd. I am convinced, on the contrary, that diseases are subdued by agents which produce a similar affection; burns, by the heat of a fire to which the parts are exposed; the frost-bite by snow or icy cold water; and inflammations and contusions by spirituous applications. It is by these means, I have succeeded in curing a disposition to acidity of the stomach, by using very small doses of sulphuric acid in cases where a multitude of absorbing powders had been administered to no purpose." (See I. Hummel, Comment. de Arthritide tam tartarea, quam scorbutica. Budingae, 1738—in 8, pp. 40, 42.)

As for myself, I accept fully and unequivocally the principle "contraria contrariis curantur," which, if understood philosophically, is identical with the principle "like cures like."

Where do we find the greatest opposition, between two individuals who pursue totally different, or between those who pursue the same avocations? Interests which are not similar, never oppose each other. Doctors may look upon each other with a squinting eye; but doctors and lawyers will never quarrel on account of professional interests. There is no antagonism unless there is analogy. Women of equal beauty will look

upon each other as rivals ; talents of the same order and rank will do the same ; tastes that are closely allied, or judgments boasting of the same degree of acuteness and the same amount of practical wisdom, will never yield to each other ; but there is no opposition where there is no analogy ; in proportion as similitude increases, opposition does, so that analogy may be and must be considered the highest expression and development of the law of antagonism.

There is no sense in the formula "contraria contrariis curantur," except so far as it is admitted to be identical with the formula "similia similibus." The formula "contraria contrariis" is true only when it is understood of the *antagonizing analogy* between the *remedies* and the *disease ;* but it becomes false and absurd when it is understood of a pretended *antagonizing difference* existing between the *disease* and the *remedial agent.* There is no such antagonism in Nature. What is the contrarium of an inflammation of the liver, of a sick-headache, or a bowel-complaint ?

It seems to me that the homœopathic school is an essential ally of the doctrines of vitalism. Like these it considers disease an abnormal condition of the dynamic or vital forces of the economy ; like these it acts upon the principle that the true and philosophical mode of effecting a cure, is to produce such an impression upon the vital powers as will cause them to react against the morbific influences.

Vitalism and the homœopathic school simply differ in their mode of producing this impression. The homœopathic school teaches that this impression can be most adequately produced by remedies that act analogically to the forces productive of disease.

I cannot abandon this theme without making a few remarks in reference to the various experiments which have been made upon living beings, for the purpose of discovering the genuine forces of remedial agents, and the physiological principles which govern the life of the animal economy.

Enthusiastic physicians have, at all times, brought their own bodies, while in a state of perfect health, under the influence of remedial agents, in order to obtain a precise knowledge of their remedial virtues, and of the use which they are capable of affording in disease. The learned Professor of the Institutes, in his essay on vitality, states his belief that the value of a remedial agent is to be determined "ab usu in morbo;" or from the curative influence which it manifests in a given case of disease. It is undoubtedly true that, as long as the value of a remedial agent has not been verified a posteriori, it remains more or less hypothetical. But can we, with propriety, and without violating

the principles of inductive philosophy, resort to the application of a remedial agent in a given form of disease, without having first determined its remedial virtues in a healthy system? My opinion is, that we cannot. Indeed, primitive man, unless he enjoyed a special revelation on the subject, cannot have been aware of the existence of vegetable or mineral poisons until, by some accident or other, he brought them in contact with his living organism. Nor can he have had an idea of using them as remedial agents, when he observed the first case of disease, until a correct knowledge of their medicinal virtues enabled him to establish, by a process of a priori reasoning based upon experience, a proper relation between the disease and the remedy. It is a matter of course, that all such experiments upon the human body, should be carried on without endangering life.

Both the humoural and homœopathic school have been distinguished by the great zeal with which those experiments have been carried on. But there is this difference between the two schools, that the humoural school pretends to reproduce by medicines the identical disease, whereas, the homœopathic school simply teaches that the medicinal disease, far from being identical with the morbid condition of the vital forces, merely simulates it as its lifeless and momentary form.

Hear Magendie: "You saw me," says he, "give rise, at my pleasure, to pneumonia, scurvy, yellow fever, typhoid fever, not to mention a number of other affections, which, so to speak, I called into being before you."

And Andral: "Those derangements of functions and organs produced by the experimenter, when he introduces different deleterious substances directly into the blood, are likewise those that are produced by the sting or bite of certain animals; they are also those that take place in smallpox, measles, and scarlatina, of a malignant nature as it is called. They are the same derangements that appear in persons exposed to putrid emanations, vegetable and animal, and to miasmata from the bodies of other persons that are themselves diseased and crowded in confined places. Lastly, they show themselves also in individuals whose blood is only imperfectly or badly repaired by insufficient or unwholesome diet."

Deluded mortals! Is not this world a world of effects, and can the world of effects act as the world of causes? As life originates in the world of causes, so does disease, which is a *vital poisoning*. Disease may be *simulated*, but not identically reproduced by the substances which owe their existence to the morbid influences acting down upon this world of effects from the world of causes; in this world of causes, disease acts upon the vital forces analogically, as chemical poisons do upon our

bodies here. Chemical poisonings are the only diseases that the world of effects can legitimately claim as its own.

Experiments have also constantly been made upon animals for the purpose of determining the physiological laws of the animal economy. Unspeakable tortures have been inflicted for that purpose upon dogs, mice, horses, cows, rabbits and pigeons, that seem to enjoy the special privilege of ministering to the slaughtering energies of physiological experimenters. The vital philosophers are the only ones that have raised their voices against these horrible mutilations of the brute creation. Some of these experiments have shed a little light, but only a feeble gleam, upon the functions of certain parts of the nervous system; but I am confident that their importance has been greatly overrated, and that they are of next to no use in their bearing upon therapeutic science. A man starts a physiological speculation, he takes hold of a beast, mutilates it fatally, and, from the phenomena which the vital principle manifests in this mutilated and dying being, he draws conclusions relative to the operations of the living and healthy organism of man. Most of Magendie's experiments are of this nature. To prove, for example, that the nerves do not absorb, he severs a limb completely from a trunk, leaving it connected with the trunk only through the nerves. He then applies the morbific virus, and finds that it does not act. Or to prove that the veins absorb, he severs the limb, leaving only the veins; and, on applying the poison, he finds that absorption takes place. I really do not see that such experiments prove any thing else except that when a poison is mechanically introduced into the blood, it is mechanically carried along with the current. This mode of extorting from Nature her inmost secrets, leads only to deceptive theories; and whatever great and untiring energies Magendie, Müller, and their friends may have evinced in carrying on their physiological experiments; nevertheless, the true mode of investigating Nature's operations, is, to humbly watch their free and regular evolution as Newton did in the fall of an apple, and Kepler in the phenomena of motion of the heavenly bodies.

The *chemical physiologists* constitute a school that numbers among its members some of the finest, most persevering and most gifted men who devote their energies to the cause of science. We need but mention Mulder of Leyden, Liebig of Giessen, Dumas of Paris, and Dr. Draper of New-York.

The doctrines of this school are less calculated to exercise an important bearing upon the treatment of disease than upon general hygiene.

I shall briefly indicate the leading views of this school, and

then inquire whether they may be made available to therapeutic science. Some of these views are peculiar to the brilliant and expert Professor of Chemistry of New-York University.

An animal is an oxydizing machine evolving heat.

The functions of the animal economy rest upon three cardinal results, the combustion of carbon, of hydrogen and of nitrogen; carbon being given out by the lungs in the shape of carbonic acid, hydrogen by the skin, lungs, and bladder, in the shape of water, nitrogen by the kidneys in the shape of ammonia.

The animal creates nothing, it simply gathers.

This gathering is accomplished by means of a progressive oxydation of the food introduced into the stomach.

Digestion is simply a process of fermentation carried on by means of the substance called pepsine.

This pepsine is mucus secreted by the stomach, and acted upon by the oxygen which is carried down to the stomach by the saliva.

The result of this fermentation is a splitting of the nutritive particles or molecules, of the starch molecules for instance into lactic acid.

By means of this fermentation, the food in the stomach becomes a pulpy matter; the different articles of food all terminating in the starch group, which is composed of

Grape sugar,	C_{12}	O_{11}	H_{11}
Gum,	C_{12}	O_{11}	H_{11}
Starch,	C_{12}	O_{10}	H_{10}
Lignine,	C_{12}	O_{8}	H_{8}
Dry cane sugar,	C_{12}	O_{11}	H_{10}

Human food may be divided into two classes,—one, which contains nitrogen, the neutral nitrogenized bodies; and one which does not contain nitrogen, the non-nitrogenized bodies.

The non-nitrogenized bodies, fat, starch, gum, sugar, alcohol, are designated as the elements of respiration; the neutral nitroganized bodies, fibrine, albumen, caseine are designated as the elements of nutrition.

Fibrine, albumen and caseine are the primordial constituents of all animal and vegetable nutritive substances; hence these substances are all isomeric bodies.

The comminuted food is absorbed by the lacteals originating in the villi of the coats of the intestines.

This absorption takes place by a process of capillary attraction through the microscopic orifices of the lacteals.

The lacteals absorb the elements of respiration, the veins those of nutrition.

The deposition of fat in the tissues is a purely chemical and physical process; fat is already formed in the food, from which the animal gathers it.

The circulation of the blood is likewise explained on chemical and physical principles.

The systemic circulation originates in the oxygen existing in the arterial blood having a stronger affinity for the coats of the arteries than the blood itself has; this is therefore pushed bodily forwards by the oxygen; the circulation stops as soon as venous blood enters the arterial tissues.

The pulmonary circulation is owing to the affinity of venous blood for oxygen; the arterial blood not having any such affinity, it is pushed along by the venous blood.

The arterialization of the venous blood gives rise to animal heat.

These several propositions Dr. Draper has illustrated by the most beautiful experiments which it is not my object to relate here.

It is evident that physical principles are involved in some of the functions of the animal economy, especially in the mechanism of vision and of hearing; but it seems to me that the existence of a vital force inherent in the tissues of the organs cannot be denied. At any rate the chemico-physical doctrine of life must necessarily be prepared to meet the following objections:

1. The secretion of the gastric juice cannot be explained on physical principles, for it is only the *living* stomach that can secrete it.

2. It is asserted by the chemical physiologist that the true gastric juice may be manufactured by mucous membranes, no matter whether of the stomach or the bladder, being dissolved either in muriatic or acetic acid. According to Schwann and Müller this artificial digestive principle may be neutralized by an alkali, and afterwards precipitated from the neutral solution by acetate of lead, and obtained again in an active state from that precipitate by hydrochloric acid. Such assertions are unfounded, inasmuch as it can never be ascertained whether such an artificial digestive mixture is a real substitute for the true gastric juice, whereas, on the other hand, the experience of all medical observers establishes the fact that hydrochloric acid, if given at all in the necessary quantity to act as a dissolvent in the stomach, ruins the digestive power of this organ.

3. If the animal merely *gathers*, and does not *assimilate*, it is for the chemist to prove that the *human* head is contained in a *cabbage* head.

4. Dr. Draper's views of the circulation of the blood are contradicted by the fact that *venous* blood courses through the pulmonary artery, and *arterial* blood through the pulmonary veins; and moreover by the fact, that the portal vein fulfils both the office of artery and vein.

5. In regard to animal heat, it may be observed, that if animal heat be a mere result of a process of combustion going on in the lungs, there must have been a moment when the system existed before the evolution of heat took place; the various secretions, preparatory to the arterialization of the venous blood, must have been carried on without any animal heat being present. Is this possible? It is for the chemical physiologist to solve this objection.

Again: is it certain that remedial agents are assimilated by the animal economy in the same way as nutritive substances are? This is very doubtful. Dr. Wright introduced into the stomach of a dog an ounce and a half of the sulphate of iron, along with a pound of bread and milk, after the animal had fasted fifty-six hours. The presence of the iron could not be detected in the thoracic duct by the tincture of galls. Mitscherlich, of Berlin, could detect no lead in the blood of the various secretions of those who laboured under colica plumbæ. Liebig positively asserts that he never detected the least trace of a vegetable medicinal substance in the system.

No disease can be cured on chemical principles. "In certain diseased conditions," says this remarkable chemist, "in which the blood acquires a viscid consistence, this state cannot be permanently removed by a chemical action on the fluid circulating in the blood-vessels. The deposit of a sediment from the urine, may, *perhaps*, be prevented by alkalis, while their action has not the remotest tendency to remove the cause of disease. Again, when we observe, in typhus, insoluble salts of ammonia in the fæces, and a change in the globules of the blood similar to that which may be artificially produced by ammonia, we are not, on that account, entitled to consider the presence of ammonia in the body as the cause, but only as the effect of a cause."

I cannot lay down my pen without expressing my warmest sympathy for that kind of family teaching which is carried on in our school, and which is so different from the pompous teaching of most other Universities. Our school now rests upon a foundation as firm as a rock in the ocean. The talent of its Professors, who are equal to the best, and superior to many; their unwearied kindness, their justice, and their unbounded liberality, are certainly not its least guarantee of success.

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