

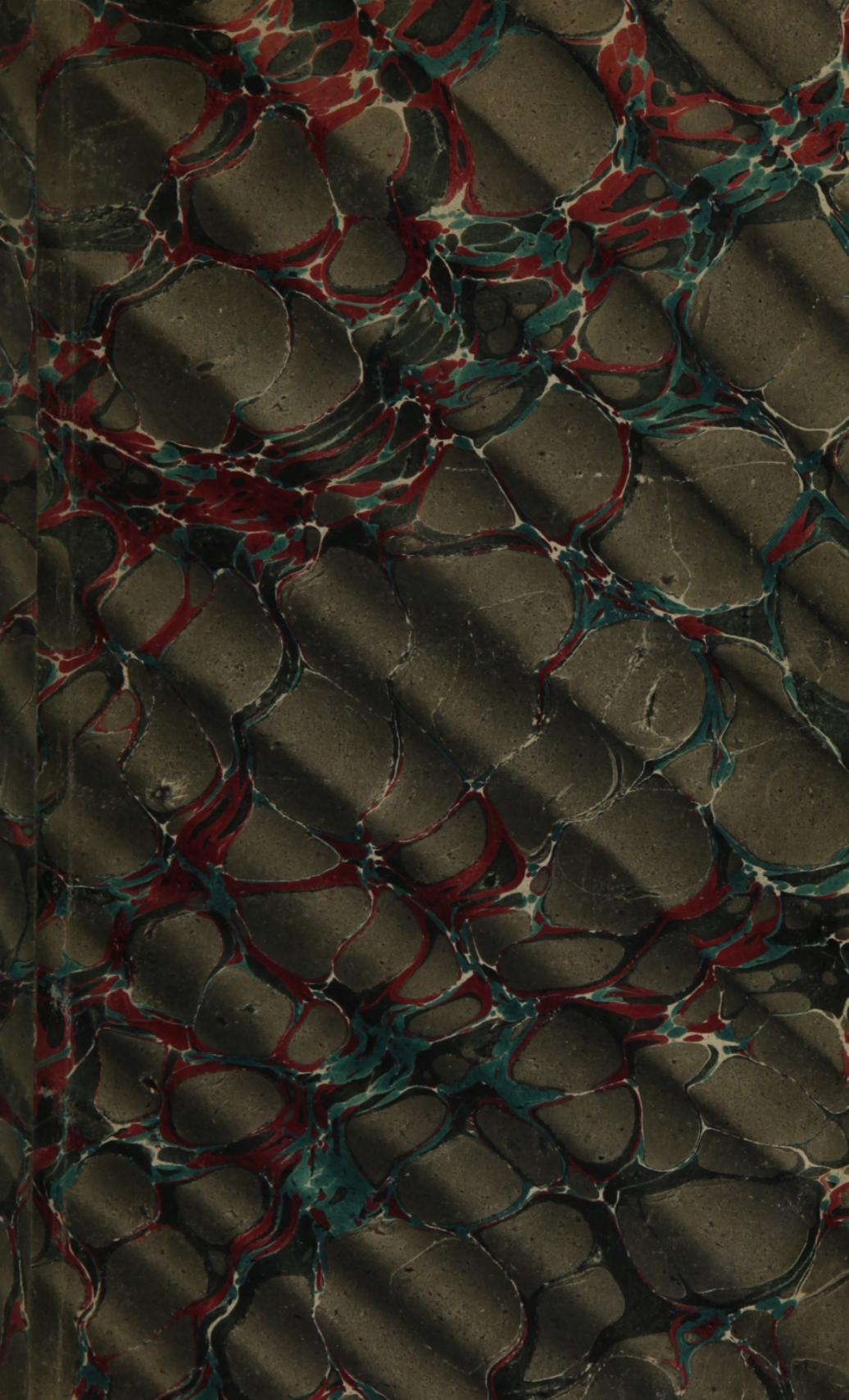
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OUTLINES
OF THE
SCIENCE OF LIFE;

WHICH
TREATS PHYSIOLOGICALLY
OF BOTH
BODY AND MIND;

DESIGNED ONLY FOR
PHILOSOPHERS, AND OTHER CANDID PERSONS.

TO WHICH ARE ADDED,
ESSAYS ON OTHER SUBJECTS.

By **ELISHA NORTH, M.D.**
OF THE CONNECTICUT MEDICAL SOCIETY, HONORARY MEMBER
OF TWO OTHER MEDICAL ASSOCIATIONS, CONDUCTOR
OF AN EYE INFIRMARY, AUTHOR OF A TREATISE
ON SPOTTED FEVER, &c.

Philosophical, as well as mathematical Truth, is always highly agreeable; often beneficial; it is the same in every age; it is always consistent with itself; and calculated for the meridian of all parties and of all nations; and needs nothing to help it out.

NEW-YORK;
COLLINS AND CO. 117 MAIDEN LANE.

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Southern District of New-York, ss.

BE IT REMEMBERED, That on the 16th day of November, A. D. 1829, in the fifty-fourth year of the Independence of the United States of America, *Collins & Co.*, of the said District, have deposited in this office the title of a Book, the right whereof they claim as Proprietors, in the words following, to wit :

“ Outlines of the Science of Life : which treats physiologically of both Body and Mind : designed only for Philosophers, and other candid persons. To which are added, Essays on other subjects. By Elisha North, M.D. of the Connecticut Medical Society, Honorary Member of two other Medical Associations, Conductor of an Eye Infirmary, Author of a Treatise on Spotted Fever, &c.

Philosophical, as well as mathematical Truth, is always highly agreeable : often beneficial : it is the same in every age : it is always consistent with itself : and calculated for the meridian of all parties and of all nations : and needs nothing to help it out.”

In conformity to the Act of Congress of the United States, entitled “ An Act for the encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the Authors and Proprietors of such copies, during the time therein mentioned.” And also to an Act, entitled “ An Act, supplementary to an Act, entitled, An Act for the encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the Authors and Proprietors of such copies during the times therein mentioned, and extending the benefits thereof to the arts of Designing, Engraving, and Etching Historical and other Prints.”

FRED J. BETTS,

Clerk of the Southern District of New-York.

EPITOME OF VITALITY:

1. ANIMATED beings are *forced* into existence by generation, and that too without their own consent; but they are afterwards kept in continual action, at least for a limited time, by their own sensations, by their own volition, and by the following external or unassimilated agents: namely, atmospheric pressure, oxygen, caloric, light, electricity, and aliment, or things voluntarily taken internally.

2. The mysterious property—to most people mysterious—of sensation and volition, is occasioned by the united action or configuration of *sensitive solid and fluid matter*, and the *sentient spirit*, aided by caloric, &c., which rapidly changeable power, or spirit, is perpetually generated from the circulating blood.

3. There are two sorts of living matter: viz. that which is *irritable*, and that which is *sensitive*. The former belongs to vegetables; but animals contain both kinds, which makes one main difference between vegetables and animals. It can hardly be

needful to remind the scientific reader, that animated beings, like plants, possess other growing, restorative, and changeable properties, or the *Nisus Formativus* of Professor Blumenbach; and that it is not always easy to distinguish the vegetable qualities of matter, from those which are animal.

4. The sentient spirit, or animal soul, possesses the property of operating upon other animal souls, by signs and speech, through the agency of nervous or sensitive organization, air, light, and more solid bodies, and also upon its own animal organs.

5. By such means, communities, herds, flocks, or shoals of animals are kept together; but the sentient spirit is not so efficient, or formed so plentifully, as to produce vigilant thought perpetually; nor is the sensitive matter of the brain able to assist the sentient spirit, in thinking, without occasional rest or sleep.

6. The united configuration of a suitable quantity of the organic spirit of the brain, and the fluid and flabby substance of that organ or sensitive matter, and the organs of sense, are as necessary to produce sensation and thought, as the united operations of husband and wife are, to produce and rear a family of children. We have indulged in so plebeian a comparison, lest we might be misunderstood by tyroes in the study of physiology.

7. The succession of animated beings is accomplished by sexual organs. The operation of the vital organic spirit and other fluids, and living semi-solid organization of a fully developed testicle and ovarium, produce the male and female semen: both are alive, or they possess vital properties; and their sympathetic union occasions a new being, which has

the propensities of the parents. It does not, however, come within our plan to detail minutely on this subject, any more than it does to exhibit all that is known on the intricate subject of metaphysics; for, after all, a very minute knowledge on either of those very intricate subjects, although very gratifying to human curiosity, are not very necessary in the common coarse affairs of life.

8. Thus is given an outline of the manner, in which the animal world is formed, including the intellectual part.

9. How mind or body is occasioned in other worlds, or off from this globe, is beyond the reach of inductive philosophy; but faith or opinion kindly helps us in such a dilemma. These, however, vary among different people, and in different ages, and in different parts of the world. Some opinions or sentiments, however, are more beneficial than others, and should be encouraged.

MEMENTO.

The needful agents, or causes, which perpetually act within every one, occasioning life, are

1. Atmospheric pressure.
2. Caloric.
3. Vital steam or its elements.
4. Oxygen.
5. Light.
6. Electricity.

} Vital Powers. |

These powers, and likewise organization, are constantly supported by the atmosphere, by solid food, by the blood, by water, or other liquid aliment,

by external heat, light and electricity. Heat, light, and food may be either natural or artificial. Every living being, or vital thing, is upheld in a somewhat similar manner. Generation continues in existence, the species of every living thing or being. Medication is wanted only in case of sickness. The blood exists conveniently, within the body, in abundance, as a pabulum of the organization and its vital steam, and also of the sentient spirit; whereas the other supports of vitality exist, without the body, until taken in.

PREFACE.



THE practice of agriculture and that of medicine are founded on facts ascertained by observation. Farmers and physicians, who have but little erudition, conduct their business upon empirical, traditional, and hearsay principles. Such men have their crude theories; but then, these do not have much influence upon their practice. The facts embraced by agriculture are few, when compared with those of medicine; hence the greater comparative ease with which a knowledge of the former is obtained. That practical wisdom, however, which is needed to make the business of agriculture profitable, is not designed to be included in the last position. Both those sciences or arts have their philosophy. That of agriculture is the more easily learned, because almost every kind of knowledge has a bearing upon that of medicine.

The agriculturist should understand the laws or propensities of living vegetable matter, in order to know how to cultivate it skilfully; and also the propensities of domestic animals, in order to rear and manage them properly. The physician, if not the politician, should likewise learn the propensities of animal matter, including that of the mind, or its cause; especially that of those animal organs, and their fluids, which belong to a human being. The former character should acquire such knowledge with a view to increase his medical faculty, or ability of assisting his fellow-beings in health and in sickness; and the latter

character, with a view to government ; for it must be admitted, that an accurate knowledge of the animal or organic propensities, or laws, of living matter is to the physician, if not to the politician, of more importance than an accurate knowledge of the mechanical structure of such matter when dead ; and it must also be allowed, that the physician, politician, and the agriculturist should understand the vital, animal, and the vegetable laws in as thorough a manner as the chemist does the ordinary chemical affinities, or the mechanic the mechanical laws of matter.

In physiological discussions, we should not take an abstract, mathematical, or mechanical view of the atoms of matter, or as they appear by the microscope, considering them as perfectly dense, and as possessing permanent qualities ; for the fact *really* is, that the properties of vital matter are perpetually changing, as viewed by the human mind ; and nothing further can be *known* respecting any kind of matter than what their properties indicate. This important fact should be kept constantly in view.

There is a more natural relation between vegetable and animal life, than there is between medicine and common chemistry. The latter, however, has a relation to both the former.

Agriculturists have occasion to manage sentient and vital beings of the lowest order, while politicians, physicians, military officers, teachers, and commercial characters have occasion to manage those of the highest class. Hence the greater difficulty which is to be encountered, and likewise the greater risk and knowledge required, to conduct the latter kinds of business. Hence, also, the reason why more honour should be awarded to those who do great justice to the latter kinds of employment.

Although the most obvious chemical and mechanical laws have some influence in the animal body, yet this influence is small when compared with the animal propensities. By the word propensity, is meant not only an inclination, but an ability or power in an animal or vegetable organ or part, including their fluids,

and spirit, caloric, &c., to perform certain movements or actions. This power has been called *Nisus Formativus*, vitality, and likewise animal chemistry. Vitality—using the word in a personified sense—adds to unorganized matter, irritability, sensibility, and changeability. The last quality exists, however, in some degree in dead matter.

To students of physiology, the first volume of Dr. Darwin's *Zoonomia*, and also his *Phytologia*, and Dr. John Brown's *Elements of Medicine*, are recommended to be read in connection with the present treatise. The first book, in some respects, is preferable to the last. The works of Brown and Darwin, however, should be recommended in a very qualified manner; for, as practical guides in medicine, experience has proved them, especially the work of Dr. Brown, to be sometimes pernicious. But those writers, although full of errors, have shown us the true mode of ascertaining the laws of living animal and vegetable matter. Of course, they are valuable to the physician and to the politician, when regarded as physiological treatises, although they are not highly esteemed as pathological works; and yet Dr. Brown designed his for such.

If the ingenious Dr. Brown had been a practical physician, he, doubtless, would have published a very different book; but, as the case is, the publication of his *Elements of Medicine* constitutes a very important era in the science of life, rather than in that of medicine in particular. From what has been said, it is not to be concluded that the writings of Drs. Brown and Darwin, are now as useful as when they first appeared. This would be to suppose that the science of vitality had made no progress since they wrote.

The writings of Mr. John Hunter, Bichat, and many others should also be carefully studied.

With regard to merely metaphysical authors, they, almost without exception, as is believed, have been insensibly drawn into great errors, by too much neglecting the operations of the brain and its halitus, including the nerves or sensitive matter.

and the organs of sense, and also their respective fluids and spirit, in their account of the mind. On this and other accounts, it is believed that many medical men are better metaphysicians than any other class of citizens, not excepting even metaphysical politicians.

We think that we have shown to the attentive, erudite public—and for the very *first time*—the real link or true connection that exists between the science of physiology and that of metaphysics. We suppose also, that it might be shown that the whole science of metaphysics, however ingenious its superstructure may have been, has, unfortunately hitherto, been made to rest upon a sandy or false foundation. We likewise maintain, that the learned are indebted to a very few physicians, including Dr. John Brown, for a true knowledge of the science of life. Some of the other persons to whom we allude, are Harvey, Hartley, Darwin, John Hunter, Bichat, Carson and Barry, Gall and Spurzheim. We trust, that we shall be regarded as aiding in the same great cause of *physiological truth*.

Our book, or a part of it, has been written to show, that vitality is not a *simple*, but that it is a *compound principle*, occasioned by an animal, or by a vegetable spirit, as the case may be, and other fluids and caloric, and by animal and vegetable solid or semi-solid structure.—That generation is the exciting, or remote, or chief cause of a principle, which is immensely powerful and multifarious in its effects.

It has been generally supposed that physiology, or the science of life, has a particular bearing upon pathology, or the art of medicine. Although this may be true, yet it is equally true, that it has an important bearing upon the science of government, and likewise upon that of education, and also in the formation of the public sentiment; notwithstanding which, its study is too much neglected by those who more particularly attend to the latter sciences.

We hope to convince the reader, that there is a compound vital spirit, both in animals and in plants; that such spirit is form-

ed by caloric, either from the blood of animals or from the sap of plants, as the case may be ; that every sort of life is dependent upon such a spirit, either in an active or torpid state ; and that such a substance is what counteracts or prevents chemical decomposition—That mind, as well as the other functions of life, is dependent upon that spirit, when it is animal ; and that no unknown spirit, or immaterial nonentity is needed to account for any of the phenomena of vitality, even in human beings—That the Christian, or other person, can as easily prove the immortality of such a compound spirit, or substance, as is contended for, when it is human, as he can that of any other. We shall take more pains to produce a full conviction upon the mind of the reader, on account of Dr. Darwin in particular, among the moderns, having failed, in the opinion of some, to accomplish a similar object.

The vanity or other propensities of human nature has induced some to suppose, that man is possessed of two distinct natures : that he has an animal nature in common with living creatures on this earth, and that he has a spiritual nature in common with angels. It is, however, much easier to suppose things, than to prove them true.

False science, or error respecting the human sentient spirit, has occasioned an immensity of mischief on this globe, both in physic, in government, in education, and in the formation of the public sentiment. For error is almost always fraught with evil. Inductive philosophy sometimes requires, that an individual should take precisely the same disinterested view of the habitudes, qualities, and effects resulting from every kind of mind, that he does of any other object that engages his consideration. This is one of the best ways of ascertaining the mental propensities. No apology, as is believed, is needed for the novel use of the word propensity, as a kind of *technical term* ; because the nature of our subject and the state of the language has made its use expedient. The word propensity, as defined by us, has a more active signification than the word property, so much used, of late, by physio-

logists. The two words, active property, may, however, be applied to express the idea of the changeable quality of living matter, whether such matter be spiritous or not.

What has been written on vitality may be regarded, if the reader chooses, as a candid, physiological, and metaphysical peep from the moon, or some other planet, at the nature of vitality on this earth, as now ascertained by a very few rational and curious beings, with a view to the increase of their beneficent power and pleasure. Such intricate knowledge, however, is, fortunately, as the case may be, of very little moment to the great mass of the infinity of sentient and insentient beings. Of course a very few only of such beings, even among those that are rational, can be expected to learn the doctrine; and some must be expected to oppose it, as they did Phrenology, without understanding it. Some errors, however, are made sometimes to do good, as well as truth. The latter, however, is the better commodity.

Should the candid and intelligent part of our readers approve of our work, they doubtless will recommend it to others. To the decision of such, and such only, it is the duty of the author to submit; for, when a book is published on Algebra, or Conic Sections, or Physiology, it should be reviewed only by those who understand those sciences. It may be proper to say, that a part of what is contained in this book has been heretofore published.

The writer has reasons for saying, that the opposite interests, and vast number of prejudiced persons, existing in society, often render it unpleasant and hazardous to publish the truth, *even when the interest of correct science makes such a publication very much wanted*; Such hazard arises from the circumstance, that one may be in danger of hurting the feelings and imaginary interest of *one's less informed friends*; unless great care is used. No mention, perhaps, need be made of the power of enemies to injure. Wise decision, disinterestedness, and courage, may often be usefully exercised upon such an occasion.

Whether the discovery intended to be claimed in the following discussions, respecting the identity of the main vital principle

with the halitus of the blood, will be thought by others of much consequence, or whether it will turn out, as have those of Dr. Darwin, Dr. Le Gallois, and Dr. Bichat, respecting the seat of the vital principle; or whether it will be ranked with that of Dr. Harvey, or with those of Drs. Gall and Spurzheim, or with those of Lavater, or with those of metaphysical authors, it does not become the author to anticipate. * It may, perhaps, be more becoming, to claim only the merit of thoroughly trying to establish the truth, respecting the vital properties of the halitus. For a very few others, as well as ourselves, have thought that it was alive. Halitus, steam, vapour, and spirit, or their elements, are used in this book as synonymous terms, or nearly so.

They who may expect, in the commencement of our investigations, experiments, in proof of our main position, namely, that the halitus of the blood is the main vital principle, are informed that such a position is expected to be proved to be correct, from experiments and observations had on living animals, which have already been made an indefinite number of times. We think that there is such a flood of false science in the world, that when one publishes a book on a subject of science, such publication should contain not only the truth, but plenary of evidence in relation to it, and the evidence should be enforced, in a variety of ways, so as to occasion a full conviction upon the mind of the reader; especially if the treatise is designed for a primitive textbook. Lawyers manage thus to obtain a just cause.

The essays which have been added to our Outlines, it is hoped will be useful to the reader and to the public.

The one on the *very delicate* subject of exhumation has been read, while in manuscript, to a highly respectable mathematical professor in one of our first colleges, with a view to get his opinion, whether the essay would give offence to those out of our profession? the answer was, that he should think not. A learned lawyer has given the same opinion.

Cavillers who suppose that we have written a book against religion, are informed that such a surmise is so far from being true,

that the work, so far as that is concerned, tolerates, although it does not equally commend, every kind of religion found on this globe. Besides, we are not weak enough to suppose that we could essentially injure true religion, if we were so disposed; and we certainly feel no inclination to do it.

It is hoped that the work will be read by the young; yet, owing to the varying propensities of mankind, it will probably give the most pleasure to the aged.

We are aware, that the market is so glutted with foreign physiological books, that it may well be made a question whether another of such a description is wanted. We, however, hope for a small share of domestic patronage, at least for an original work.

The fashionable physiological works have been written by young men. An experienced person may impart instruction more useful, in relation to its practical tendency.

They who may think that unnecessary pains have been taken to defend our doctrine, and question the expediency of its publication, are informed that this has been done partly, in consequence of its promulgation having been discountenanced by few. The Work, we are aware, may be unfashionable. Little emolument is expected from it. The writing it, has increased our power as a practical physician; whether it will benefit readers, time must decide. The objectionable parts of the book, in the opinion of some, whose ideas happen to be wrongly associated, have been, in a printed form, before the public many years without doing mischief. Hence the inference is made, that no harm in future will be done.

Phlogistorn miasma, when regarded as a general term, and an immaterial human spirit, have had each, in their turn, an existence in the minds of men;—the first, to account for chemical phenomena; the second, to account for the production of epidemic fevers; the third, to explain the phenomena of the human mind. The unpleasant state of doubtfulness, owing to the want of true knowledge, has occasioned such speculations.

The reader is requested to remember, that we do not use the term hallucination, in our work, reproachfully towards any class of citizens ; because, in some moral affairs, that state of mind may do good, or harm, as the case may be. When exact knowledge, however, is required, hallucination does mischief.

Critics must admit that a work may be useful, if most of the sentiments contained in it may be found by ransacking a multitude of books ; and that ridicule is not a test of truth. But sometimes

Men must be taught, as if you taught them not,
And things unknown propos'd as things forgot.
Without good-breeding, truth is disapprov'd ;
That only makes instructive sense below'd.

POPE.

New-London, (Con.)

Jan. 1830.

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On page 141, between the poetry and prose, insert the word *VESALIUS* on the right hand, and on the left hand, the words, Mr. Editor.—Then there will be in number three Essays signed *Vesalius*, as they were originally first published.

On page 172, for Dr. Famer read Dr. Fancher.

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The reader is requested to correct the following errors:
 On page 141, between the body and prose, insert the word *Vesicles* on the right hand, and on the left hand, the words *M. Editor*.—Then there will be in number three Essays signed *Keays*, as they were originally published.
 On page 173, for *Dr. Keays* read *Dr. Keays*.

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INTRODUCTION.

1. It is denied by many that there is any evidence, that the main vital principle of animals is gaseous, or spiritous; or that it is in the form of steam; or that we know what the principle is.

That the circulating blood furnishes a sort of matter, which acts as the main vital principle, and that such matter is in the form, at least a part of it, of a halitus, steam, or spiritous matter, or their elements, is rendered highly probable from the negative circumstance, that the dissection of *living* animals does not render the main vital principle visible, or otherwise easily perceived, unless the halitus, steam, or odour, let loose by such dissection, be that principle, or a modification of it. The odour is very strong in carnivorous animals, especially that of the arterial blood.

Admitting such halitus to be the hidden spiritous principle of vitality, then the proof of such a fact would be positive. And were it not for the strong associations of ages to the contrary, and the fear of the ridicule of some, and the unjust persecution of others, and the dread of being thought visionary by perhaps almost all, the present writer would say, that the last position was not very improbable. And he is tempted to assume courage enough to say still more, viz. : that the existence of such a fact, as is contended for, is experimentally

proved by the butchers, and likewise by the guillotine, which is sometimes used in France. The matters which obviously escape when an ox is butchered, are the red blood and its halitus or steam, and animal heat; which heat is needed to make steam. These principles very perceptibly exist in the animal when alive, and cease to be perceptible when the animal is *completely dead*. Mr. John Hunter says, the vital principle, or vitality may remain in a detached animal part sixty hours; and those who practice ingrafting trees, know that vegetable halitus, or life, may remain still longer in detached vegetable twigs and buds. An animal is not *entirely dead* until its halitus and other matters have lost their vital properties; or until the commencement of chemical decomposition. The serum of the blood resists the causes of putrefaction four times as long as the crassamentum does, at least out of the body, according to the experiments of Sir John Pringle. This may be owing to the former portion of blood now alluded to, being more highly charged with the finer and more vital matter than the latter. The butcher, as well as ourselves, would probably say, that the blood, if not its halitus, was the principal active cause of life.

2. Dr. Darwin is probably entitled to the honor, among the moderns, of first teaching extensively the doctrine, that the main vital principle is spiritous. But he did not undertake to teach *what such principle was*. He contended only that it was a somewhat spiritous substance, which originated directly from the brain. The present writer contends that said principle originates directly from the circulating blood, and that it is the halitus of the blood, or its elements; subject, to be sure, to a modification by the various organs and parts of an animal, including its brain. The soft structure of said organs and parts, at least many of them, are such as to be easily operated upon by such a cause while those organs and parts are alive, and while the halitus is confined to them. Did it come within our plan to treat of the mechanical laws of animal matter, we might attempt to shew that halitus or steam might be as well fitted to aid in moving the fine animal organs and parts, as other and more obvious steam is

known to be in moving common mechanical steam-engines. Vital steam is different from that which is non-vital. By vital steam, we mean that principle which, when let loose from its organized confinement, easily assumes the form of common steam or odour. Other fluids, and other matter of a less animal nature, doubtless assist in occasioning the quick and perpetual movements of the animal organs and parts. These last matters to which we allude, are caloric, oxygen, the electric or galvanic fluid, light, and perhaps the magnetic principle.

3. If the present author were to claim the discovery, (and he thinks he has a right to do so, at least in some measure,) that the halitus of the blood and its organic modifications is the *vital efficient power* which moves the finer parts of an animal, or fits them for motion, leaving the coarse blood and other agents, including atmospheric pressure, to do the rest of the configuration, then he would rest his claim principally upon inductions drawn from the following experiments.—1. Stop the circulation of the blood; or 2. Withdraw it from an animal, and the phenomena of the vital powers soon cease; or those phenomena are at once very much diminished. (a) 3. Starve an animal; or 4. Freeze one, and the same result, or death, happens, not however quite so soon. In the two first experiments the vital spirit, as well as the coarse blood, is suddenly obstructed in its natural operation. In the two last experimnts, the halitus of the blood may be spoiled, and the animal organs and other fluids injured. All of those experiments now alluded to, prove that there is something in or connected with the *circulating* blood, that is needed to vi-

(a) As a partial exception, however, to the above rule, it may be mentioned that vital spirit acts sometimes with considerable vigor, for a short time, even when the circulation of the blood is suspended, as was the case in the illness of Mr. John Hunter, as stated by Dr. Good; and as is the case in those persons who acquire a voluntary power over the motion of their own heart. Such facts shew that the whole circulating blood is not the most active vital or *sentient* principle, but that there is another agent connected with the blood, which is more necessary for the configuration of, at least, *sensitive parts*.

vify the animal organs and parts. The two last experiments prove such vivifying principle to be of a finer texture than the coarse parts of the blood. For starved and frozen animals have, both of them, coarse blood enough to support life for a much longer time than actually happens. This last idea should be attended to. The dissection of living animals discovers nothing so likely to be said efficient principle as the halitus of the blood. Hence the inference is made, that such halitus or spirit is the hidden vital principle. Said principle itself is concealed while the animal is alive, although its effects are visible. When the animal is dead, that principle escapes, and cannot therefore be found by the anatomist. This fact may account for the errors committed by those characters when they teach physiology. It is believed that the vital spirit has its aids in moving the animal solid mass; but those aids are of a less animal nature,—the coarse blood and other animal fluids excepted,—and have not therefore an equal claim to rank as the main or prime principle of vitality. We are aware that some may say, that the term *main vital* principle might as well be applied to caloric or oxygen, or to the whole mass of blood, as to its halitus, or its elements. We have, however, just given our reasons for doing differently.

That the blood in the most perfect animals furnishes the vital principle, or that it is itself that principle, can be demonstrated synthetically. Bleed a person until the appearances of life disappear, or nearly do so, and then immediately supply such a loss of blood with vital blood from another person, and the vital appearances shew themselves at once. The sick are sometimes thus benefited.

4. Others have partially glanced at the above doctrine, particularly Moskati and Rosa, and recently Daniel Pring, M. D. There is likewise in an old Latin book published at Vienna in 1553—8, by the very unfortunate, but illustrious *Servetus*, the subsequent sentence, viz. ; “*Vitalis est spiritus qui per anastomosis ab arteriis communicatur venis, in quibus dicitur naturalis.*” From which it seems, there was then an opinion, that vitality was dependant in part upon a spiri-

tous principle, connected, in some manner, with the circulation of the blood, although the true mode of that circulation was not then fully demonstrated. It is not said what sort of *form of matter that was*, by Servetus. Dr. Bostock, in his physiology, says, that Plenck was an accurate writer of extensive information; and that he paid much attention to the "*gas animale sanguinis*," or halitus of the system, perpetually originating from the blood; and that Plenck believed, "that many important effects in the animal economy were produced therefrom." Dr. B., however, thinks Plenck's "opinion altogether unfounded." It does not appear that Dr. Bostock paid much attention to the subject. Of course it can hardly be needful to say, that Plenck's opinion must be the best.

Mr. John Hunter supposed the blood was alive, which doctrine is probably true, notwithstanding the jeering of the late celebrated John Bell; for why may not the fluids in a living animal possess vital properties?

Mr. Hunter says, the blood of hunted animals, when killed in the chase, does not coagulate. Such blood may have lost its halitus by the violent exertion of the animal, hence has not enough of that vital principle to coagulate it. More experiments are however wanted on this subject. Dr. Carol of New-York says, "hunters, or cruel sportsmen, know very well that when a stag has been *run to death* his flesh is as tender as if it had been preserved weeks in ice, and that it spoils in a very short time." The vital spirit, being mostly exhausted by the violent exertion of the animal, probably occasions this peculiarity in the meat. For that spirit, or vitality, is what prevents putrefaction, and likewise retards animal digestion.

5. There are phenomena that shew that the animal spirit, or vital halitus, as well as other parts of an animal, including its coarse blood, is varied by the aliment eaten by the animal, and by other causes. For instance, such spirit is more energetic, and likewise more ferocious, among those even of the human species—meaning to put an obvious case—who eat freely of raw palpitating flesh and blood, and at the same time drink liberally of wine and ardent spirits, than is the case with rice and other vegetable eaters and water drinkers,

or even with fish and milk eaters. (b) The former characters do not live as long as the latter. The good of the whole re-

(b) Respecting the use of diluted alkohol as an article of liquid food, we are satisfied that human beings can maintain life both with, and without, spirit. Mankind can likewise live with, or without, tea, or coffee. People can also support life with, or without, fish; and so of other things. The sick will likewise often get well with, or without, medicine. There is a choice, however, to be had, as respects the supports of life. Individuals cannot always, however, have their choice, for want of funds. The experience of mankind shews such facts. It is well known, however, to *all* adult persons, that ardent spirit is more liable to abuse than almost any other article. We do not believe, however, that the public good requires that such spirit should *always* be confined to the druggist shop, as has been testified by many physicians. The wholesome influence of the medical profession is injured by such heedless conduct. Injury may likewise be done to aged individuals, if not others, who use spirit sometimes, not only as a medicine, but as liquid food. Variety of food, both solid and fluid, is often useful.

The human stomach can be *educated* or habituated to use a greater variety of liquid and solid food than that of any other animal. The power of habit upon the human brain is known to be very great; and it should be understood, that the stomach is scarcely inferior to the brain in respect to habit.

It is fortunate for mankind that God has thus elevated man above the brute creation. The resources against those greatest of all evils, viz. individual starvation and general famine, are wonderfully increased by such a provision in the human stomach. Hence man has been aptly called an omnivorous animal.

An erroneous opinion has been, of late, extensively promulgated in this country; viz. that ardent spirit is not a supporting stimulus of vitality; that it creates no power in man; that it only acts, like the spur upon the horse, on power already existing; and that it is decidedly and powerfully poisonous. If these positions were correct, spirit could never be useful in asthenic diseases, and should be banished from the druggist's shop; for it is never used, as a medicine, where there is too much vital action.

The justly celebrated John Hunter was once asked, when a witness before a court of justice, whether he did not know that spirit would kill animals *almost instantaneously*. Mr. Hunter's answer was, that he knew that brandy was not a poison to cats, notwithstanding the common opinion, for he had often forced it, in considerable quantity, into the stomach of those animals without killing them, provided he so conducted the experiments as to prevent the brandy from getting into the lungs. The Rev. Joseph Townsend, in his *Guide to Health*, enumerates both fermented and ardent spirits among the articles of nutrition.

Diluted spirit, like tea, pure water, soda-water, and other fluids, is, after all, proved by the common experience of mankind to be, what it was supposed to be by the celebrated Dr. John Brown, a diffusible support to the

quires that such should be the case. Carnivorous animals are more energetic than herbivorous ones. A horse, who is

animal and sentient spirit of man; and imparts, when used in proper quantity, a temporary vigor and activity to both body and mind.

The semi-solid organization of the animal machine is, however, too soon worn out by repeating such liquid food too often, *if one wishes to live many years*. Too much heat produces similar effects in warm climates. The human machine may, however, rust out, or fail, for want of a sufficient quantity of the support of life. Mankind have, however, the important consolation of knowing, that great nicety is not needed in so common a case; because the human body is tough and durable, and can repair very considerable injuries.

The advantages to the whole community of a distillery is this: It gives the highly important economical power of converting certain kinds of liquid and perishable food, or the elements of food, into a form which permits it to be easily kept, and in an improving condition, for any length of time; and likewise to be transported with facility, or cheaply, from place to place, where it may be wanted. To a distant army, for instance; to remote and exhausted labourers; to travellers both by sea and land; to the poor in great cities, when in a starving condition. Without such a process as is now alluded to, bad cider, sour wine, inferior grain, the juice of the cane, maize stalk, perishable potato, and inferior molasses, &c., would be lost to the community, or nearly so. Would it be wise for a whole nation, or nations, to relinquish the benefits derivable from the still, because the most worthless part of society may think proper to abuse the privilege? Upon such a principle, the use of many discoveries might be abandoned; such as a steam-boat. Many people are killed while on board such boats.

It might be useful in the science of political economy to ascertain how much is saved to the public by the still, and also by common salt; and likewise how much food and drink is created, that would not be brought into existence were it not for the power of preserving it. It might also be beneficial sometimes to prevent good liquid and solid food, or the elements of food, being converted by the still into that which is inferior in quality, if such a measure was practicable. Injury to the whole public might perhaps thus be sometimes prevented.

In illustration of our sentiments, the reader is reminded that common salt is likewise useful, like the still, in preserving food for future use. Human beings and other animals can live, however, without salt. Mankind notwithstanding will make salt, and likewise spirit. It is not to be inferred from our illustration that brandy is equally useful with muriate of soda. The illustration is made to open the eyes of some people.

Although it is admitted that brandy is not so wholesome a kind of food as good wine, or milk, or bread, or meat, yet some, for want of means, may be compelled to use that or some other kind of inferior aliment. Too many, alas! for want of industry and discretion, use inferior supports of life,

fed plentifully with hay and oats, is more alert, and likewise less manageable, than when he is kept sparingly upon hay

especially bad or new spirit, who might do better for themselves. Those, however, who, from unavoidable poverty, or even other convenient causes, occasionally use the most unwholesome means of living, certainly ought not to be publicly abused for doing so. Does not their conduct cheapen better articles in the market, and thereby benefit even those from whom the abuse may come? Might it not be as well for the whole community, if every one used occasionally and *properly* his proportion of the superior and inferior things found in the common stock for the support of life? The aged and the discrete, and seldom the young, should use ardent spirit, and these only when needed. Such spirit should not, however, be banished from our houses. The indiscrete may, however, be taught how to use it; and mutual judicious influence may be brought into action to prevent its abuse.

Will not sots use more spirits in proportion to its cheapness?

The Utopean idea, extensively promulgated of late, that 6 or 7 millions of dollars are now annually saved in the United States, by a diminution in the use of ardent spirits, needs no answer from us after what has been written.

Ought not a plenty of the bounties of providence, even if artificial, to be provided?

With a view to preserve the honor of our country, in relation to intemperate drinking, we have no better resource than to acknowledge, that there is a moral excitement now in respect to alkohol. Of course, the information which may be drawn from our public conduct, as stated in newspapers, cannot be relied on as philosophical truth. It might be dangerous to individual reputation, and it might do harm, to make cool and true statements in a common newspaper at this time. Such statements may, however, do good, even now, in a medical publication. At any rate, it is contended that, although we, as a people, are liable, like other large communities, to delusion, we are not, after all, a nation of drunkards.

That spirit, when old and good, can sometimes be beneficially used, both as a medicine and liquid food, is a physiological fact. Questions of expediency respecting its use can, in general, be best determined by each individual, sometimes assisted by professional advice.

The general habits of a country can, however, be modified in relation to dress, and, as respects the habits of living, in regard to diet and drink. Some enthusiasm may, however, be needed to accomplish so great an object. The habits alluded to, like modes of religion, and like politics, depend on artificial public sentiment. Before improvements are attempted by powerful bodies of men, is it not always highly important to ascertain what is philosophically correct? If this is neglected, may not an improper fashion be introduced? Is not this the manner in which such fashions get among mankind?

In the case before us, two errors have been committed. On the one hand, it has been supposed that the use of ardent spirits was unprofitable, as re-

only. A domestic tyger is placid and docile until he gets a taste of meat and blood, when he instantly becomes ferocious, and gratifies his propensity by escaping, the very first opportunity, to his favourite jungle. Mankind should never eat blood, unless it be for medicinal purposes. The laws of MOSES were undoubtedly correct on this subject. He says, that the blood is the life, or that the life is in the blood. The sentient spirit and other fluids, and solid organization of a full-blooded blackmoor are different from those of a white man, as is evident from his woolly hair, greater odour, and less mental and bodily capacity. This truth, however, like many others, is called in question.

6. Although it is proposed to treat of vital animal matter, yet it may be proper to say, in this introduction, that the more perfect animals contain various other kinds of matter. In a desultory view of the case, some of the matter in animals may be regarded as chemical, some as vegetable, some as

spects the whole community; and, on the other hand, it has been maintained that its use was always highly deleterious, except as a medicine. The former belief is undoubtedly a mistake; and, in regard to the latter, an immense number of false statements have of late been made. There is, however, too much individual suffering, without doubt, from every sort of intemperance in all countries. But should any part of society associate to acquire the pleasure and power of directing an individual's conduct in relation to the manner in which he shall manage his own person? Individuals are apt to feel hurt, and with reason, by such a kind of interference; they wish not to be treated like cattle. Besides, individuals, in general, are the best judges in relation to their own personal concerns, or wants; and they undoubtedly have the most direct and durable interest in proper personal management.

The ephemeral restlessness of societies in such a novel cause, will not, however, probably do much durable good or harm; having reference to the whole community.

In illustration of this opinion, the reader is reminded that the recent restless attempt to put the whole public to a substantial inconvenience respecting sabbath mails, and travelling on that day, proved abortive. This shews the good sense of a whole community, although not that of a party. Many evils must be submitted to with patience.

Many questions of expediency are wrongly determined for want of correct philosophical knowledge. This remark is made to remind the reader of the high importance of our favourite science.

highly animal, some as solid, some as fluid, some as spiritous; and each may partly change into the other, and form a *tertium quid*. Caloric, oxygen, light, the electric fluid, if not the magnetic one, are added to, and likewise needed by animal bodies, to prevent the too great cohesion of the other materials. Human beings can live for a time without light, but they finally become sickly by doing so. Hence light is regarded as one of the supports of human vitality, as well as that of plants.

7. Organic spirit and other fluids, aided by caloric, &c., and solid or semi-solid organic structure occasion organic propensity. Such propensity governs or controls the common chemical affinities. This quality, by the by, will be mentioned hereafter, as a distinguishing characteristic of animal matter. The animal or organic propensities are not, however, always equal to controlling the chemical affinities, for so long a period as self-love or self-protection among mankind would require. In this respect animals are worse off than vegetable beings. For instance, vital steam is more easily condensed or spoiled in animals by extreme cold than in plants. But, on the other hand, locomotive animals have more power to avoid the evil alluded to.

It may be useful to notice particular instances where chemical laws triumph over animal ones. When the spontaneous combustion of the human body occurs, chemical laws control the animal ones. So likewise where gangrene and sphacelus happen in a wounded limb, from too great a loss of blood, decomposition is the result. This last fact furnishes a very convincing argument in favour of the doctrine, that vitality, in a great measure, originates from the blood. In bad fevers, whether they originate from a putrid ferment from without, or from within the body, and in persons otherwise poisoned, chemical decomposition, quickly going on, may help to occasion many of the phenomena which occur in such cases. Sudden death from the yellow fever, plague, poison, &c., may perhaps sometimes thus be accounted for. Hot weather expedites chemical dissolution, and that process commences at a lower temperature in ani-

mal than in vegetable matter ; at least, this is so when such matter is dead. And why may it not be so, in some degree, in similar matter while alive ?—especially where the vital powers are weakened. Should not human beings, when in such dangerous circumstances, be kept cool ? A slower sort of decomposition may, perhaps, occur in the scurvy, and in slow putrid fevers. In such cases there may be a great strife within the body between chemical and vital laws, and the physician may sometimes settle the contest in favour of the life of the patient ; and antiseptics may be useful in such cases as well as on animal matter when dead, i. e. to preserve it.

Too small a quantity of caloric, as well as too much, often destroys or stops the vital configuration of mankind, which suspension is death. A familiar instance may be here mentioned. A good swimmer's exertions in cold water are much sooner ended than they would be upon the land, or in warmer circumstances, and he is drowned. This event often happens for want of the knowledge now imparted. Drowned persons are sometimes reanimated by restoring the caloric, oxygen, and atmospheric pressure, which they have lost. The cork jacket, recently recommended, would be nearly useless in such circumstances, on account of the diminution of the needful caloric. *Ice-water* will render nearly one half of a strong man paralytic in two hours. So needful is caloric to vital energy. But such a paralysis may be easily cured ; because neither the elements of vital steam, nor animal structure, are spoiled so soon in such a case.

It is ascertained that chemical, mechanical, and vital laws all operate, both in animals and in plants, in occasioning an appropriate quantity of heat and steam in them, while in health. The respiratory apparatus in animals aids in this highly important process. The whole of the configuration of matter in such a case cannot be comprehended by a finite mind, on account of its infinity.

8. The remote causes of epidemics must be sought for in the perpetually exciting causes which uphold vitality in general. Every living thing is liable to sickness and death,

or to a deviation from the most perfect state of vitality. The causes alluded to are atmospheric pressure, oxygen, light, caloric, electricity, and those solid, fluid, and spiritous substances, or their elements, which constitute the aliment of both animal and vegetable vitality. Such causes may be either excessive or deficient in quantity, or they may be bad in quality. For instance, there may be either too much, or a deficiency of, heat for the best good of vitality; and aliment may be bad or unsuitable in quality.

Mankind unavoidably experience great, and sometimes sudden, changes in relation to caloric. They are also subjected to changes as respects light, oxygen, electricity, and atmospheric pressure, especially when they ascend high mountains or remove to distant countries. Their food, and drink, and medicine are varied in an immensity of ways. The sudden and great variations in the supports of vitality in general, when acting upon the excitable, very spiritous, highly complicated, and very flaccid or yielding human system, is abundantly equal to the production of epidemic fevers and other morbid diminutions or vitiations of human vitality. And without having recourse to that fashionable imaginary, or unperceivable agent, which has been called miasm, or malaria. It has been shown in our Essay on Peat, that there is no unusual putrefaction in a swamp. Of course some other agent than the one which has been supposed to operate, must occasion fevers, when they happen to those who reside in the vicinity of marshes. The human system being more complicated, and likewise more spiritous, renders man more liable to distempers than any thing else that is alive. There are, however, more resources to remedy such a defect.

It is difficult, if not impossible, for a finite brain to ascertain all the causes and their complications, as they may operate in occasioning any particular epidemic, or even many other morbid configurations of vitality.

The supports or causes of vitality in general, as well as for mankind, are more abundant between, than upon, the hills; and they are likewise more liable to variation. Hence there is more sickness and death in the former than in the latter

location. Such a fact, however, does not prove the existence of such a poison as malaria or miasmata.

The agricultural means of subsistence, and likewise those from fishing, are the most easy to obtain under the former circumstances. Cities, colleges, armies, and hosts of men should, however, be located upon high and dry ground, if the means of living can be as conveniently had. If such was the case, we should probably have less of yellow and other bad fevers. Great changes, however, as respects climate, should be avoided by those who can do so. In illustration of our sentiments we remind the reader, that in the immense valley of the Mississippi, beef, and every other common eatable thing, although existing there in great abundance, is said by the high authority of the Rev. Timothy Flint, to be inferior in quality to the same eatables which are procurable in the northern and eastern Atlantic states. May not such a defect in the supports of vitality be liable to occasion fevers and other torpid diseases of both body and mind, particularly in strangers, until such eatables can be improved in quality by the cultivating hand of man? We are aware that some may think that we mix up physical and moral causes too much in taking such views of body and mind. We, however, think we are right; and we are fond of jumping at once to the truth, without much intermediate reasoning.

May not both religious and political fanaticism be more easily excited by human agency among a population where human vitality may be somewhat vitiated? There is too much moisture for the best good, as respects quality, although not as respects quantity, for almost every living thing, including mankind, in new countries. New countries are well known to become more healthy, for both man and domestic animals, by drainage and cultivation.

Notwithstanding the evils of new settlements, their benefits are still greater to an immense number of people, though not to all concerned, especially to the poor.

By attempting to explain too much, men often lose sight of that which is obvious. Those things in medicine of most va-

lue are the most easily learned. Neither the physician nor the patient, in ordinary cases, has much to do with the mechanical or chemical laws of animal matter. They will therefore be neglected in our desultory outlines of animal life. This course is taken to avoid confusion. Such philosophy as has been adopted is the most common among the unlettered part of society, and also among politicians and intelligent agriculturists. The farmers have done better in the application of their speculations to their practice, than has been the case with medical men. They have not so much unoccupied time to be filled up in making ingenious, but false theories, or what may be called learned quackery.

Mechanical philosophy is often useful to the operative surgeon ; and a knowledge of chemistry is needed in pharmacy. But it is evident that chemical elements, in occasioning life, are subjected to animal and vegetable laws, immensely more efficient and vastly more varied than those of chemistry. The minor parts or organs of an animal have been neglected, because such parts are not essential to animal life. Both the author's and the reader's task is thereby made more easy. But from what has been said in this paragraph, the tyro reader, if he designs to be a medical man, is not to suppose that his close attention to the mechanical structure of the human body, and to its minor organs and parts, is not more or less needed. Neither should he believe the study of chemistry unnecessary.

9. Lest we should fail, in the opinion of some, to make out our case, as the lawyers say, the subsequent remarks are made at the risk of being tiresome.

10. The following words are from paragraph 10. of Dr. Calwell's translation of Professor Blumenbach's Physiology. —“ Such, then, appears to be the four principal constituent parts of the blood, viz. the watery *halitus*, (or, more aptly, animal odour) ; the serum ; the *cruor*, or red globules ; and the coagulable *lymph* ; which several parts, as long as they retain their native degree of vital temperature, continue in a state of the most equable mixture, constituting an uniform and homogeneous fluid. It will be proper to enter into a

more minute consideration of those three portions of the blood which stand last in the above enumeration : as to the aqueous (odorous) exhalation which we have mentioned, it does not appear of sufficient importance to claim any further attention ; indeed, as it is also discovered in other parts of the body, it cannot be considered as proper to the blood alone," &c. &c.(c)

11. It would seem from Dr. Blumenbach's expression in the above paragraph, notwithstanding his high opinion of the other parts of the blood, that the Doctor had some antipathy to the odorous part of it ; otherwise he ought not to have treated it so disrespectfully. Now, our object is to show that such part of the vital blood is at least of equal, and, in some respects, of far greater, importance than any other part of that noble fluid. But as similar prejudices exist in the minds of others, and as it is difficult to remove prejudice, we hope to be excused, even for saying more than otherwise would be needful. At any rate, what we may say may serve to fill up a chasm in science, and to shew that life, whether animal or vegetable, cannot exist in an active state without a halitus or its elements ; if that be not the most universal vital principle. Such a principle exists more universally in every living thing or being than any other sort of matter, not excepting even the blood, considered as a whole, or vegetable sap.

Deprive an organ, or part, of its red blood, and a degree of sensibility or irritability may remain in such part ; but deprive the same part of its halitus, and it is unirritable and dead. Hence such halitus is of more importance to vitality than the red blood.

(c) We would ask the learned professor, for what purpose such an universal halitus or spirit is made ? In the third volume of the New England Journal of Medicine and Surgery, is a short, but valuable essay on Animal Chemistry. In that essay it is said, that Dr. Bostock has ascertained that the serosity of the blood, besides other matters, contains two per cent. of solid animal matter of a specific kind, *that is not rendered insoluble by heat*. Now, conjecture would say that such matter, while it was under vital influence, caloric, &c., was well fitted to form a vital spirit or halitus.

12. The circumstance of the universality of a vital steam or its elements, would seem to give it some claim to attention, notwithstanding it has been so much neglected. The chemical gasses have been thought worthy of attention ; and that, too, without subjecting any one to the censure of being called visionary. For those who may be determined to regard vital halitus as no way differing from common vapour, the subsequent suggestions and queries are made : 1. It is more than highly probable that vital steam, besides the vitality it may impart to, and receive from, the other parts of the blood, is endowed with many other vital properties which do not belong to a halitus that is not alive. And, 2. Why may not the effects of some of those vital properties appear even intelligent, when acting upon, or in combination with, sentient organs and parts ? Are not the effects of a sentient vapour *visible* in a young girl's face when she blushes ? May not a diminution of the vital properties of such a halitus occasion, at least in part, suspended animation, lethargy, trances, torpor, in spotted and in other fevers, palsies, and many other complaints ? May not intense cold deprive such a steam of its vital properties, and thereby occasion death ? Drowsiness, one of the prominent symptoms in freezing persons, shews the sentient spirit to be much affected in such cases. Caloric is probably wanted to form a vital spirit.

13. In case vitality was a mere property of solid organization, independent of a spiritous principle, and likewise of the coarser fluids, then no functional disease could ever exist. But in every complaint, however small, there would be an alteration of solid structure. Now the fact is, that disease may be so violent and sudden as to cause death, and yet occasion no organic derangement that can be detected, even by the most skilful anatomist, after the death of the patient. This is a convincing fact in favour of the spiritous nature of a part of vitality. To alter essentially the structure of a part, or organ, often requires considerable time, but a spiritous principle can operate in an instant, and so violently as to occasion great pain and distress ; and even death. The most nervous parts, or those which contain the vital principle in its most active form, are

the most liable to functional distress, and likewise to functional disease. (*d*)

14. When a large portion of the brain has been absorbed, or disappeared, or otherwise spoiled by disease, or old age,—and such cases have occurred—it is very probable that in such a case the sentient spirit is made to occupy the vacuum thus occasioned ; so that said spirit may still act for a short time upon the remaining part of that sensitive organ. For the void between very essential sensitive parts must be filled with something, as a medium of communication. Those who believe that irritability, sensibility, and changeability of the solid parts are the only vital properties belonging to animal organs and parts, and who consequently deny the existence of the spirit of animation, as a distinct, although dependent principle, possessing important vital properties, would be puzzled to account for those phenomena to which we allude ; so also would the immaterialist.

15. If we have failed to satisfy every one, that halitus, or its elements, is one of the main vital powers, and that the other fluids possess vital properties, or are in a condition soon to do so, we think it must be admitted that we have filled up an important chasm in the science of life ; and that we have shown that the following sorts of changeable matter exist in vital beings. 1. Muscular, or irritable matter, in some form. 2. Nervous matter, or that which is sensitive. 3. Some kind of vital fluid, either red, or colourless, to be called blood or sap. 4. Some sort of halitus, vapour, or its elements. 5. Some changeable matter that has not become perfectly alive. 6. Caloric, light, oxygen, and other chemical matter.

(*d*) Those who are very fond of morbid anatomy are not always sufficiently aware of the truth taught in the above paragraph. Owing to the limited capacity of human beings, there is reason to fear that the business of teaching minute anatomy, however useful to surgery, is sometimes injurious to the brain of the teacher in case he is to be a practical physician ; for such teacher's ideas are liable to be too much associated with dead, solid, animal organs. The physician should study the living propensities of such organs and their finer matter.

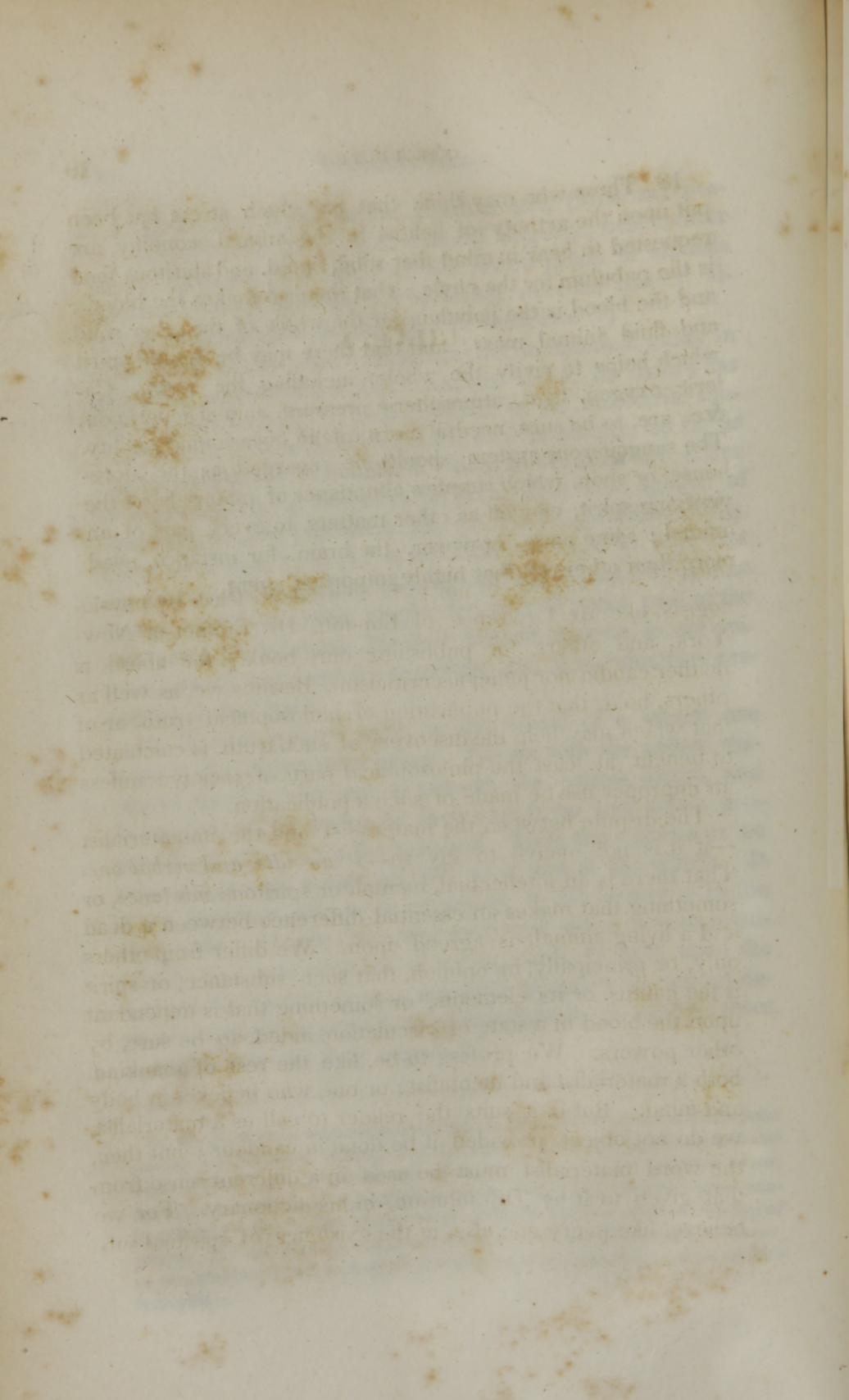
16. Some few plants, as the sensitive one, (*Mimosa*) possess sensitive matter, if, in anatomical language, such matter be not nervous; and some of the lowest grade of animals may not possess, anatomically speaking, nervous matter, although some of their matter must be sensitive. (e)

If there is any other substance not mentioned, either in animals or vegetables, which occasions mind, its nature has not been discovered. The supposition of an immaterial substance,—which should be regarded as a nonentity, so far as human perception is concerned,—does not help us any, either in physiological, or metaphysical discussions: the opinion of many respectable persons to the contrary, notwithstanding. By way of hint to those concerned, we wish to say, that the doctrine of sympathy among the solid parts of human beings, which has been taught for several years past in the renowned Philadelphia Medical School, may be, in our opinion, greatly improved by ingrafting into it our doctrine respecting a vital spirit.

17. If two or more teeth in the wheel of a watch are broken, the engine stops going. Not so with the animal machine! for if a solid part is injured, the halitus, gluten, and other parts of the blood, by their expansion and other properties, at once arrest the mischief. Help can sometimes be rendered in such a case, as well as in that of the watch. It is not, however, always as necessary in the former as in the latter case. Unless there was such vital steam as is contended for, that was capable of acting suddenly both upon the mental and bodily organs, mankind would be in a most deplorable condition, considering the immensity of hurtful causes to which they are daily exposed.

(e) M. Dutrochet, who has paid curious anatomical attention to his favorite subject, has satisfied himself that the numerous sympathetic excitabilities which he has very attentively noticed in the leaflets of the sensitive plant, are dependent *partly on a principle in its sap*. We here perceive a great analogy between the vitality of the blood of animals, and that of the sap of plants. M. Dutrochet thinks also that he can, by the microscope, discover, or see, nervous matter in that plant.—See *American Medical Journal of Philadelphia*.

18. Those who may think that too much stress has been put upon the activity of halitus in the animal economy, are requested to bear in mind that solid, liquid, and spiritous food is the pabulum for the chyle ; that this last makes the blood ; and the blood is the pabulum for the whole of the other solid and fluid animal mass ; and that there may be a vital spirit which helps to vivify the whole, including the brain. Caloric, oxygen, light, atmospheric pressure, animal generation, &c., are, to be sure, needful assistants in occasioning vitality. The sanguiferous system should be regarded as the storehouse, or shop, which supplies abundance of materials for the vivifying spirit, as well as other matters, to every part of an animal ; some parts, however, the brain, for instance, need more than others of that highly important agent.



CHAP. I.

An Address in Vindication of the Book.

WE wish and expect not to be abused, at least by physiologists, like Mr. Lawrence of London, Dr. Emmet of New-York, and others, for publishing our book; for abuse is neither candid nor judicious criticism. Besides we, as well as others, hold, that the publication of philosophical truth, or of that which may help the discovery of such truth, is calculated to benefit, at least the philosophical part of society; unless an improper use be made of such a publication.

The dispute between the materialist and the immaterialist—if it is not uncivil to say so—is *an idle and verbal one*. That there is an intellectual, mental, or spiritous *substance*, or something that makes an essential difference between a dead and a living animal, is agreed upon. We differ from others only, or principally, in opinion, that such substance, or spirit is the halitus, or its elements, or something that is dependant upon the blood in a state of circulation, aided, to be sure, by other powers. We profess to be, like the rest of mankind, both a materialist and mentalist; or one who believes in body and mind. But if it suits the reader to call us a materialist, we do not object, provided it be done in candour; but then, the word materialist must be used in a different sense from that given to it by Dr. Johnson, in his dictionary. For we believe, like every one else, in the existence of spiritual sub-

stances. The only dispute ever got up among mankind has been, as we contend, respecting the *peculiar nature* of such substances. We have as good a right to be regarded as an *immaterialist* as other people. By that term, however, something more is meant by us than a nonentity. The candid Dr. Bostock, in his *Physiology*, admits that a discovery may be hereafter made, which may unite three sects of mental philosophers, viz. the materialists, the immaterialists, and the spiritualists or animists. We think the discovery anticipated by the Doctor is made.

To prevent false inferences being made, we distinctly say that we believe, as well as others, that ceremonies of religion and modes of public worship are very properly used by civilized nations, as a powerful means of promoting virtuous habits and civilization.

It must be admitted by every one to be of no consequence to society—allowing the consequences to be momentous to individuals—whether religion be a divine, or an human institution. The quantum of good done among mankind in this life must be the same in either case.

In a popular history of Buonaparte are the following words. The author of that history says, that Buonaparte believed in the existence of the Deity; “and at a time when the detestable doctrines of atheism and materialism were generally current in France.” Admitting that atheism is detestable, it by no means follows that materialism, or mentalism, is so. Such an attempt to commend one individual of doubtful character, at the expense of slandering a whole nation, shows either great courage, or very great want of wisdom.

The peace of society often requires that those few characters who choose to deal in the better commodity, truth, should submit, in some measure, to be governed by those who may deal in an inferior article, viz. falsehood or error. Much self-denial and benevolence is needed to induce any one to submit to that, which he knows to be wrong, and even injurious to himself and others.

Our friend, Dr. Thomas Miner, has said in a recent publication, “that there is reason to fear that the *love of truth*

was far from being the ruling passion of a great majority of mankind." Mankind, in their daily avocations, have oftener to settle questions of expediency than those of philosophical truth. Yet physicians have occasion to settle the latter sort of questions, more frequently than politicians and divines. Hence their minds become differently associated. The same books cannot, of course, suit equally well all those characters now alluded to. Truth is, however, durable, although not always immediately productive of benefit.

We, as an author, say likewise, that the contending interests of different portions of mankind often occasion the propagation of error and falsehood ; and also retard the promulgation of truth.

Such being the state of affairs, the lovers of truth—they being in the minority—should act with wisdom and union in the promulgation of any particular truth, at least among themselves ; which may have an important bearing upon the good of mankind. By the expression *among themselves*, the reader will perceive that it is admitted, that it may not always be expedient to disturb the minds or brains of interested partizans and prejudiced persons, even with important truth. Besides, a great part of mankind have an inclination, or propensity, to *make believe*, or to make false pretences. Children are seen to do so, in their plays or amusements. Virtuous habits may thus be formed, and to the benefit of society. Men are pleased with romances and visionary tales, and the *fastidiousness of philosophy* should not always wantonly and unnecessarily interfere with such enjoyments ; and the pleasures to be derived from the pursuit of inductive truth may be abused, as well as other kinds of enjoyments.

Such wisdom and union, as has been alluded to above, should have been exercised with regard to the kine pock, spotted fever, steam-boat, and canal navigation, &c., although those cases were very differently conducted. Philosophers, like other people, have their imperfections, although they have constituted, in every age, a very useful minority. Very useful, and likewise very commendable, because it is much harder work to stem the tide or course of human affairs, when

such tide or course goes wrong, than to sail at one's ease with the tide. Such literary labour is often unavailing, and almost always unprofitable. Besides, much wisdom and discretion, as well as knowledge and courage, is often needed in such cases.

The subsequent ideas are taken from an essay written by the amiable Mr. Knox, against the study of Logic and Metaphysics. He says, "All those who have little opportunity of being actively serviceable to others, have an unquestionable right to seek amusement in abstruse speculation, or in any other pastime which is innocent. They may puzzle themselves for diversion even in metaphysics. *But if, in the course of their inquiries, they should fall upon a wonderful discovery, which, when divulged, would disturb the happy ignorance of mankind, let them for once be selfish, enjoy it in private, and withhold it from the community.*" Remarks: Something more than merely innocent and agreeable study is needed to do one's duty. To remove the *happy ignorance* of mankind, or to teach, is hard, but elegant brain work. We would ask the amiable moralist alluded to, what would be the state of mankind if every teacher should shrink from hazardous labour; through fear of disturbing the happy ignorance of some, or even the more happy, and sometimes useful hallucinations of others?

The remark is often made, in opposition to the metaphysical side of the question which has been taken by us, that, since it is agreed by all parties that the soul acts during life upon material organization, the question respecting its peculiar nature is of no more consequence to physicians than to other people. If the brain is of more consequence than the limbs, then the nature of that organ and its soul should be well understood; and the truth should be taught to others in the profession, notwithstanding Mr. Knox's objection.

Our sentiments now promulgated, although they are not *all of them* very novel, or *all* very important, are calculated, as we believe, to benefit a part of mankind, in sickness and in health, through the agency of the philosophical part of our race. Such readers are known also to receive innocent pleasure from the discoveries and investigations of science, independent of their utility in other respects. Curiosity is a na-

tural propensity, and should be directed to proper objects, with a view to counteract too much mysticism of various kinds.

We have made ourselves believe that almost any kind of philosophical truth, or discussions with a view to such truth, in the present age, that is not personal, may be promulgated, provided it is done in a suitable manner; and provided also that readers will conduct themselves properly.

The recent illegal martyrdom, or kidnapping, of William Morgan, which was done by the fanatic, if not murderous, folly of a secretly powerful society, which claims to be an honourable as well as an ancient one, will doubtless help to establish the freedom of the press and fair discussions in this country. (*f*)

(*f*) The late Capt. William Morgan will doubtless be regarded by posterity, or the whole community in this country at least, as an highly useful as well as an highly courageous character, for publishing and giving rise to much curious, long hidden, and useful information on the delusions, hallucinations, if not deceptions, of speculative freemasonry. The disclosures which have now been made, show this institution, like many moral, religious, or party ones, to be defective, notwithstanding the fulsome eulogiums of its interested friends. The whole community have an interest in knowing the transactions of a party, who may be very liable, as a party, to be too selfish for the best good of the rest of the community. Prof. Robison, Barnet, the author of *Jachin, and Boaz*, if not others of less ancient notoriety, should be honorably mentioned while writing on this subject. Justice, however, requires us to say, that Capt. Morgan, like many other martyrs in ancient times, is, in some measure indebted to his fanatical or murderous enemies for the extensiveness and durability of his genuine fame. Such is human nature.

Freemasonry is now known to be a protiform institution or association of men, which was once formed by interested or crafty men, and is still continued by similar characters, secretly to govern its own members in some measure, and likewise to gain an advantage over the rest of the community; and a history of the institution will show, that a multitude of men of every description of character have been willing, in many countries, to submit to such a government, and without compulsion, unless curiosity and sympathetic feeling should be viewed as such. Such a fact, and others of daily occurrence, shows, that individuals are not very fond of personal liberty; for this they easily resign for an uncertain advantage. It is well for society that human nature is thus constituted. Needful government is thereby more easily maintained. Among savages, personal independence often occasions

A suitable maturity, and likewise proper discipline of the human brain, is often needed to fit it for the innocent reception of many kinds of truth, or disquisitions; and such may be the case with some of the truths, or discussions which we have ventured to publish. The last remark will bring to the mind of every reader the following lines of the poet:

A little learning is a dang'rous thing;
 Drink deep or taste not the Pierian spring.
 POPE.

The above sentiment of the poet is not now fashionable. There is, however, too much truth in it.

Before we take our friendly leave of the reader, we wish to say, that we hope to see the merits of our book, if it has any, and also its demerits, pointed out by some of our friendly readers, provided it is done with candour and judgment; for we are not an author by profession, nor vain enough to suppose but that a multitude of errors may be found in it as well as in other scientific books. We are aware also, that there are more bad critics, than bad authors.

We have thought it expedient to publish a small edition, as the best means of ascertaining the opinion of the most learned, wise, and disinterested; and whether an impression can

great crimes. In an ignorant and barbarous age, freemasonry, when directed by intelligent, although imperfect characters, may have done good, in some kingdoms, where bigotted governments prevailed.

There are now two classes of freemasons; one class are called book-masons, the other orthodox: but such orthodoxy, like the camelion, may be made to assume any shape. The book-masons at present are the most popular. How it may be at a future time will depend on the management of the orthodox party; but unless they agree to keep records of their signs and transactions open to the inspection of any citizen who may choose so to do, they can never be very popular in this jealous country.

It is not so easy a matter to put down a party, whether it be a religious, political, or other moral institution, as some people imagine. But a reaction can be got up, to lessen the power and influence of any party.

We hope not to give offence to honest, disinterested, and candid men among freemasons by what we have written; for freemasonry may do some good, even now, for ought we know.

be made in favour of our book by any effort of ours. To accomplish this last object, we may have been sometimes faulty in a repetition of ideas, at least in the opinion of some.

It has been our object to make our Nucleus of Physiology, or science of life, such as we contend the nature of the subject requires that it should be made; namely, a sort of plebeian: and to the *intelligent* and *patient* reader, an intelligible piece of inductive philosophy, desultory only so far as regards our manner of teaching different subjects. We wish to make it useful to medical men, if not to politicians. But it may be objected by interested partizans, that our book is calculated to do harm, as well as good, among medical and other men. Admit this to be so, in some small degree, at least, so far as such partizans are concerned, we reply, that such is unfortunately the case with mercury, opium, and arsenic, and also with *many books*, daily made use of by medical and other men; and such must always be the case so long as injudicious readers exist. It can hardly be needful to say, that we, as an author, cannot be accountable to the public for such harm; because we believe that much more good than evil will result from our publication. We, as well as many other physicians, hold that correct mental philosophy greatly improves the medical brain, and fits it for usefulness.

As to others, it does not come within our peculiar province fully to discuss the question. That the Christian religion has a divine origin, at least in one sense, there can be no doubt; because every thing doubtless originates from, or is connected with that Omnipotent, first, or omnipresent cause alluded to. At least this is so, as viewed by the human mind.

Although we have ever considered the sentient spirit, or soul, as a modification of a general animal spirit; and although, in this particular, we have regarded mankind and the inferior animals alike; yet we do not deny but that God can make by his great, or miraculous power an exception in favour of the human soul, and make it immortal agreeably to the Christian's faith and hope. We believe God can make a known substance immortal as easily as he can an unknown one.

The discussion of such a question as that of the immortality of the soul does not belong to a medical treatise ; and as parties exist, with regard to a *future state*, we wish not to displease any party on that subject by giving our private humble opinion ; knowing as we do, that mankind are more disposed to contend passionately about opinions, than about known facts.

Some men are fond of disturbing others with their private opinions on every subject, whether correct or not. An editor of a public newspaper has recently offered in his paper, a premium of one hundred dollars, to any one who would prove the immortality of the human soul.

Now no one pretends that demonstrative proof can be produced in such a case. Faith, utility, and hope ; the last attends us through life, "nor leaves us when we die," are the foundation of our public belief on that subject. The conduct of this editor should be viewed as an imposition upon the public ; for every one allows that this subject does not admit of demonstration.

We would ask said editor, if he has any more right to injure the religion of his country, even if it be not divine, by unfair or disrespectful means, than he would have to destroy a city ; because it might not happen to be built upon a plan agreeable to his taste ? Much disturbance, or reaction is often occasioned by the indiscreet restlessness of fanatics in religion. But there may be fanatics in medicine, in politics, in freemasonry, in commerce, and in other affairs.

Our public critics cannot with fairness, as we contend, undertake a discussion respecting our peculiar religious notions, or faith, any farther than we have thought proper to publish them. Each reader has, however, a right to entertain such private conjectures respecting our religion as he may choose. But, after all, one's religion, so far as it is beneficial, can be most thoroughly known among those who may have been acquainted with one's conduct through life. We are not, on the one hand, ashamed to avow our religion *when proper* ; nor, on the other hand, desirous of that kind of ostentation now alluded to. The ground we have taken is the result of deep con-

viction, that, owing to the very nature of medical physiology, one ought to treat the subject so as not to give reasonable cause of offence to any party in religion. To suit all parties is impossible.

Philosophers *ought not to be satisfied with themselves*, unless they be better than other people, for they are under a double influence which ought to make them so; namely, the mild and wholesome influence of philosophy, and likewise that of religion. Whereas the great mass of mankind can only be, from necessity, under the influence of the latter.

True philosophy has a powerful influence in society to counteract fanaticism, which is the bane of true religion. Such philosophy should therefore receive a powerful patronage. Even anti-fanatical associations might sometimes be useful. The highly important *private* right of deciding what the will of God is, or whether the most High has revealed his will to mankind, is not given up by any individual to the very highest public authority in these United States. Of course, no civil court, under such authority, has a right to go into the inquiry what a citizen's religious sentiments may be. The powers of argument and persuasion, and not that of force, are the only civil means to be used in support of any peculiar religious faith; but *good morals* can be enforced by more powerful means.

We have said above, that we believe that much more good than evil will result from our publication: but from knowledge indirectly obtained from interested partizans in mental philosophy, that are in many respects respectable, and from ignorant and prejudiced persons, since that sentence was written, and even before our book is published, we have been induced to reconsider that opinion. The result of such reconsideration is, that, having reference to the whole family of mankind, the opinion then given must be correct. Some of our personal friends, whom we have consulted, concur with us in this opinion; and we hope to obtain, at least the good will of a portion of disinterested, curious, and candid physiologists, and not give reasonable cause of offence to any one; more especially among our personal friends and acquaint-

ances. Although the last expressions have been used, we are fully aware that they may not have so much effect as they should have, in a world like this, where religious, political, and other parties abound. A public writer will frequently be found fault with, because he will not act zealously in favour of some party; but the science of life should not be enlisted under any banner but that of truth.

Ten respectable physicians, and only ten, however, have examined our manuscript sufficiently. Nine of these have given us written certificates in favour of its publication; but the other refused to give such a certificate. This is not mentioned to find fault with that person; but to show the state of the evidence. Since the above was written, it has been approved of by others.

As this book may be read by a few persons for whom it is not particularly written, and whose brains are not properly prepared for comprehending its object, a few remarks for their benefit may be proper; for, in case any evil results from its publication, it is to be apprehended from such a source. There has been so much contention and bickering respecting mental philosophy, because the subject has not until now been fully developed, that many suppose, that certain creeds on that subject are necessary to the very existence of good government. *Now, nothing can be a greater mistake than such an opinion.* The majority can always govern the minority by laws, customs, fashions, and other expedients, without having recourse to fraud and falsehood for such a purpose; and a great and powerful majority among human beings, in every age of the world, has been, and must always continue to be, in favour of good morals, otherwise no society can long exist. One object of our book is to put an end to bickerings and slander respecting mental philosophy, among men of sense, and, by so doing we hope to prevent, in some measure, such characters from too often disturbing the rest of mankind with their speculations. At any rate, considering the conciliating measures which we have taken, and the enlightened age and country in which we live, we hope

not to be assailed by bigotry of any sort, as was the case with Columbus of old, when he appeared before the "University of Salamanca to maintain the truth of his belief, *that the globe might be circumnavigated.*" Columbus, who was a devoutly religious man, found at that time that he was in imminent danger of being convicted, not merely of error, but of heterodoxy, then considered a great crime.—See Washington Irving.

Dr. Darwin having failed to convince many of his readers of the spiritous nature of the main, or the most active principle of vitality, has induced us, like a lawyer anxious to obtain a just cause, to take more pains to establish such a fact than otherwise we should have thought necessary. Such a procedure may make our book tiresome to some of our readers; but we wish such to consider what our main object has been.

In recently looking over a desultory history of intellectual philosophy, in the North American Review, we found the subsequent words: "The sensual system had attained its complete developement when it represented the mind as a bundle of sensible notions, and God as another name for the material world." The writer of the history alluded to, like Cicero, dislikes plebeian philosophy. Now, it is capable of demonstration that such philosophy is the most useful, as well as the most common. The higher branches of literature, to balance their many advantages, are attended with the evil of occasioning too much hallucination among a part of mankind.

The very complex, curious, active, and powerful apparatus, viz. the brain in man, can be demonstrably proved to be the chief d'oeuvre or masterpiece of nature on this globe. With this proud distinction one would think mankind might be satisfied. As respects God, there is not much difference in opinion so far as regards inductive science.

The digestive apparatus, and the pleasurable sexual ones, which are attached to the two sexes, are the vice-presidents or two main pillars which support, by their action, that noble

thinking engine alluded to, perpetually, both in man and in woman, in all grades of perfection from infancy to dotage.

The writer alluded to says: "*Intellectual science is now fixed upon the basis of Locke; and that mind is an independent being, connected with material organization, which is necessary to the exercise of its faculties.*" If so, we hope our book will receive fair treatment, for it can do no harm, and it may do much good among the sick and lame. Is the mind of God encumbered with material organs? How is the case with brutes in regard to the soul?

There is no demonstrative proof of such a human soul as is contended for by the writer alluded to; or that the mass of mankind, even among the most intelligent, believe in such a doctrine. The hallucinated brain, like the mildly insane one, is, however, sometimes incapacitated from receiving such truths, as are just now stated; wishing not to give offence, but usefully to maintain for truth, an highly important metaphysical fact which may have been so ordered by God to prevent an entire uniformity of sentiment, and for a useful purpose. Harmony in conduct, however, ought to prevail among societies of men.

We hope we have succeeded more truly respecting the soul, or thinking powers, than *Martinus Scriblerus*, and his friends, the *Free Thinkers*, did. See Mr. Alexander Pope.

With permission we will close this address with the well-known lines of Mr. Pope:—

Thou Great First Cause, least understood,
 Who all our sense confin'd
 To know but this, that thou art good,
 And that ourselves are blind!
 If we be right, thy grace impart,
 Still in the right to stay;
 If we be wrong, oh! teach our heart
 To find that better way.

CHAP. II.

*On the State of Physiology and Metaphysics, for the last half
Century.*

SECTION I.

HITHERTO the medical profession in this country, and in England, have been dependant for their physiology, and especially of late, on the translations of the works of Haller, Blumenbach, Bichat, Richerand, Le Gallois, Gall and Spurzheim, Magendie, Broussias, &c., all from the continent of Europe. It should not be supposed that we mean to represent that physiology cannot be found dispersed among English, and even American, books or authors; for Dr. Cullen published a small book on physiology; also Dr. Emmet, and others. Dr. John Brown, Dr. Darwin, Mr. John Hunter, Mr. John Abernethy, Mr. Lawrence, and others, are all to be regarded partly as physiological writers. But unfortunately for the science, the whole of those very respectable authors, which have been now mentioned, lost sight of the *spiritous or ethereal key*, which unlocks or unveils the whole mystery of vitality, with the exception of Dr. Darwin. The ingenious Doctor was in possession of the *ethereal or spiritous key*; but because he did not know *precisely* from what substance, or sort of matter said *key* was formed, its very existence was denied. Dr. John Brown, and some of the oldest authors which have been mentioned, were more excusable for

their nescience on this subject than was the case with the later ones; for Dr. Brown had not the benefit of the Zoonomia, or Dr. Darwin for a teacher. Dr. Brown's Elements of Medicine were published previous to the Zoonomia.

Explanatory of what has just been said, we observe, that the ingenious recent French physiologists contend, that life, including mind, has, separately or abstractly considered, no existence independent of the *properties* of the various organs and parts of an animal; for little or nothing is taught respecting the spiritous part of such organs and parts.

The immaterialists, or the fashionable metaphysicians, at least in some countries, teach that the mental principle, or soul, is an immaterial substance, which occasions trains and tribes of ideas in connection with the brain; and that such soul, if human, is immortal; and that it can act hereafter independent of the body.

Dr. Darwin contended, that there was a material spiritous something formed by the brain, or its substitutes, from the blood, or some other fluid which is used for blood, which acts as a medium of communication among the various organs and parts, and in connection with those organs and parts, whether these be animal or vegetable; and that, abstractly considered, that material spirit is life, or a principle without which life cannot exist. The Doctor unfortunately supposed such a principle to be too fine to be capable of being perceived by the coarse sensitive organs of human beings, but he thought its existence was sufficiently evident from its effects. Mr. John Hunter, or more certainly his over-zealous disciple, Mr. John Abernethy, strenuously contends, in opposition to the recent French physiologists and to Mr. Lawrence, that there is a fine connecting medium among and in the various organs and parts of both animals and vegetables; and that, abstractly considered, that something is life. Mr. Abernethy admits that we have not the evidence of our senses for such a principle; but he every where contends that this principle, which he (Mr. Abernethy) *would have* called or named the *materia vitæ diffusa* of Mr. John Hunter, is not formed or occasioned in any way by any kind of living organization, but is superadded to, and is independent of, any organization

whatever for its existence. Mr. Abernethy supposes, and likewise Mr. John Hunter, that this hidden principle possesses the power of forming, and afterwards repairing and acting upon, living organization, whether animal or vegetable. Mr. Abernethy says figuratively, lest he might be misunderstood, that *materia vitæ diffusa* is a great chemist, architect, or organ-builder, capable of forming and keeping in existence, in spite of ordinary chemical laws, both animals and vegetables; not, however, without the aid of generation in some form: which generative power, by the by, we contend is sufficient for the purpose contemplated, both in vegetables and animals, without any superadded principle. Mr. Abernethy says, the mental principle is something different, and independent even of this last vital principle. He admits, however, that organization is necessary to the action of even the mental principle.

See philological lectures, delivered before the Royal College of Surgeons in London, in the year 1814, and in 1817.

In case we adopt the plan of Mr. John Abernethy, or what he, perhaps incorrectly, says is Mr. John Hunter's plan respecting the *materia vitæ diffusa*, then we shall be driven into the following dilemma: If such a principle be not derived from animal and vegetable organization, or the *nisus formativus* of Professor Blumenbach, but be superadded to it, it must be a wonder-working, universal, and almost omnipotently great chemist, or animal and vegetable maker, or great architect—continuing to use Mr. Abernethy's figurative expressions—capable of making an infinity of organization, both animal and vegetable; and afterwards acting upon such organization; and likewise keeping it in existence for ever, by the aid of generative propensities occasioned by the same principle or imaginary being.

Now, to be grave and serious, and not wishing to give offence, we ourselves cannot contemplate such a stupendous power existing in a single principle, in any other light than as a material God, if we may be permitted to use such an Holy expression, unnecessarily brought into existence by the great ingenuity and influence of Mr. John Hunter. We

have the example of Mr. Abernethy for using, in such a case, figurative expressions.

If either Dr. Darwin's or our own views respecting vitality be correct, there is no necessity or use for such a stupendous superadded vital principle as Mr. John Abernethy contends for, either *with a view to morals*, or for any other purpose; unless ignorance and error respecting vitality among men of science, can be proved to be more conducive to good morals than correct knowledge.

Mr. Abernethy, although highly respectable as a surgeon, must have less influence as a physiologist than almost any one which has been mentioned, and for the following reasons:

1. He has acknowledged—probably inadvertently—that were it not for certain consequences, which he dislikes, or rather, the opinion of others, he should be a Darwinian. The following are his words: “In forming my opinion on the subject of sensation, (lecture VI.) I admit that a choice of difficulties is presented to us; and I prefer that which is the least. If I judge, as I own is *natural*, of other things by myself, (i. e. as I judge of things in general,) I shall be led into a dilemma that a man of great intellectual powers and acquirements has been, and whom I have already praised for the important additions *he* (meaning the honest Dr. Darwin) has made to our knowledge of the functions of the nervous system. As we perform certain actions in consequence of reasoning, *he* (still meaning Dr. Darwin) was induced to believe that *brutes* act in a similar manner from a similar cause,” &c. &c. &c.

The limits we have assigned to ourselves do not allow us to say more, only to ask Mr. Abernethy why, in adopting grave philosophical truth, he ought to fear either men or consequences, provided he did so with discretion. But such fears have been, or rather self-interest or party-interest, the greatest bane to philosophical truth in every age.

2. Mr. Abernethy evidently prefers to be led rather than to be a leader, so far as physiological discussions are concerned; and in this respect he may be wise; for it is much

easier to follow than to lead, as every one knows. But why he should select Mr. John Hunter in preference to Dr. Darwin is now the inquiry. He tells us, to be sure, that he was afraid of being led into a dilemma by the physiology of Dr. Darwin ; but it is beyond our comprehension or powers of reasoning to discover any reason, why the physiology of Dr. Darwin should lead a *real philosopher* into a dilemma any more than that of Mr. John Hunter.

The *materia vitæ diffusa* of Mr. Hunter, according to Mr. Abernethy, and the *spirit of animation* of Dr. Darwin, differ to be sure in this respect ; namely, the latter originates, or is occasioned by, the animal's or vegetable's own organization, as the case may be ; and the former is derived from no one knows what. But it is admitted by Mr. Abernethy, that material organization is necessary to the *vital action of both*. Mr. Abernethy also believes, that the *materia vitæ diffusa* of Mr. Hunter, and likewise animal organization, are both necessary to the *vital action* of that, which he believes to be the unknown or incomprehensible mental substance.

As respects morals and a *future state*, we cannot discover even a shade of difference in the tendency of either of those doctrines ; Mr. Abernethy's declamations or insinuations to the contrary notwithstanding.

Almost all our public belief and faith respecting a *future state* is derived from the Bible. This the reverend clergy allow to be so, as is evident from their conduct and general manner of teaching.

"I know of no arguments to prove the immortality of the soul," says that good man, Dr. Rush, "but such as are derived from the Christian revelation." PAUL likewise says, "Immortality is brought to light through the gospel." 2. Tim. 1. 10. Some persons, especially among the reverend clergy, who, by the by, ought to be the best judges on such subjects, think that the cause of christianity is injured, instead of being being benefitted, by the very zealous attempts of some well-meaning writers to enlist physiology in its favour. The cause of physiological science is undoubtedly injured by these attempts.

3. Mr. Abernethy seems to act upon the principle, that physiological truth, or inquiries after such truth, can, on the one hand, be supported, or at least partly so, by the influence of so great a name as that of Mr. John Hunter ; and, on the other hand, that honest inquiries, if done by those abroad or even at home, made with the same object in view, can be put down by the hacknied cry of scepticism or mysticism. But it should be recollected, that disinterested inquirers after truth act upon the principle, that truth, when once discovered, must necessarily be very agreeable, and more or less beneficial, according to the nature of the truth or discovery, at least among wise philosophers, if not among the ignorant, over-selfish, and prejudiced.

4. Honest and free inquiry is a right which no one can relinquish. The results are to be met by argument alone, not by authority, or ridicule. It is not therefore all important what Mr. Abernethy, however respectable—and as a surgeon, no one doubts his respectability—or what Mr. Lawrence, or any one else, may think respecting a single curious point in physiology. It is as unwise to contend *passionately*, before the general public, about a physiological truth, as about a mathematical one, although they are equally certain, and also very beneficial ; but the mass of mankind cannot be adepts in either case. Such a view of the subject as has just been taken, is of so humiliating a nature that it ought to have kept Mr. Abernethy and Mr. Lawrence, and every other physiologist, at least in good humour with each other.

5. Tyroes in the study of physiology should be informed, that Mr. Abernethy, as a teacher in physiology, does not feel bound by moral obligation to acquire every kind of physiological knowledge for the purpose of teaching, for he has told us so in the following words : “ When I first heard Dr. Spurzheim’s lectures, I candidly told him, that though I admitted his opinions might be true, yet I would never inquire whether they were so or not ; because I believed the proposed mode of judging of one another to be unjust, and likely to be productive of erroneous and injurious conclusions.”

6. There are strong religious and political prejudices in England, against the study of physiology and free philosophical discussions, which does not, in the opinion of some, redound to the honour of that great nation; as Mr. Alexander Pope, Dr. Priestly, the Rev. Mr. Gilbert Wakefield, and lately, Mr. Lawrence, can testify, which do not exist elsewhere to the same degree. The manner, however, of Mr. Lawrence, and some of the others, for ought we know, might have been offensive, for we have not yet seen his book. In this country, at least in some parts of it, we profess to enjoy more *liberty in discussions of every kind with a view to truth*,—and it is hoped and believed that it is so.

As evidence of the correctness of the last position, the subsequent clauses from the political constitution of Connecticut, deliberately formed and afterwards deliberately adopted, are introduced: Clause 5. "Every citizen may freely speak, write, and publish his sentiments on all subjects, being responsible for the abuse of that liberty." Clause 6. "No law shall ever be passed to curtail or restrain the liberty of speech or of the press." From these clauses we think it no more than reasonable to conclude, that a majority of the people of this state *wish all subjects* to be fairly and rationally discussed, with a view to *truth*. There, however, may be a minority opposed to such liberty; for unfortunately contending interests, passions, and prejudices exist even here, and likewise, too much public scandal, for the peace of society and for the honour of our country. If the sentient spirit of our own brain, speaking agreeably to our own theory, should fail to make a durable and useful impression upon that of our readers, our book, like that of many others, will have been written in vain. We wish to remove certain prejudices respecting the science of life, respecting exhumation, &c. &c. from the brains of men of science. Some of those prejudices are very ancient, *deep rooted*, and very injurious; at any rate, injurious to all who may be sick. Hence we write in the cause of suffering humanity in general, not in favour of any particular party; and hope for the aid of others in effecting our object. And we believe

that the present enlightened age and country in which we live, are favourable to so great an undertaking.

7. Dr. Darwin was fully aware that his *Zoonomia* was an unfinished and imperfect work; but he expected others to make improvements upon his plan of philosophizing respecting vitality.

Notwithstanding the powerful influence of wrong associations of ideas, and Dr. Darwin's failure respecting his main vital principle, or spirit of animation, with too many respectable physiologists, we hope to aid in bringing into fashion again, after a lapse of thirty years, among a few disinterested physiologists, Darwinian sentiments, or those which prevailed in Old Testament times, respecting a material vital spirit, both vegetable and animal; or a halitus, or vital steam, or its elements, which is the produce of vital organization, and which, in its turn, reacts, or occasions configuration, upon, or in said organization. Such a halitus, or its elements and organization, may, however, sometimes be dormant or torpid, as is the case in vegetable seeds, and sometimes in *dried and shrivelled* insects and worms, and even dried fish, and require warmth and moisture, if not other aid, to occasion their most conspicuous active forms. What a plebeian philosopher has said in relation to heat is equally applicable, or nearly so, to *vital steam*, viz. "that it animates, invigorates, and beautifies all nature. Its influence is absolutely necessary to enable plants to grow, put forth their flowers, and perfect their fruit. It is closely connected with the powers of life, since animated beings lose their (active) vitality when heat (or vital steam) is withdrawn."

Common sense philosophy is the easiest, and makes the best practical physician.

8. To shew that we are not alone in the high opinion that has been given in favour of the first volume of Dr. Darwin's *Zoonomia*, the following excellent lines of poetry are presented to the reader; and they cannot, we think, fail to afford the highest pleasure, if he be fond of good poetry. It may be proper to remind the reader, that the *Zoonomia* was published subsequent to the publication of the Doctor's celebrated poem, *The Botanic Garden*.

To ERASMUS DARWIN, on his work entitled ZOOLOGIA ; by
DEWHURST BILSBORROW.

" HAIL TO THE BARD ! who sung, from Chaos hurl'd
How suns and planets formed the whirling world ;
How, sphere on sphere, Earth's hidden strata bend,
And caves of rock her central fires defend ;
Where gems new-born their twinkling eyes unfold, 5
And young ores shoot in aborescent gold.

How the fair flower, by Zephyr woo'd, unfurls
Its panting leaves, and waves its azure curls ;
Or spreads, in gay undress, its lucid form,
To meet the sun, and shuts it to the storm ; 10
While in green veins impassioned eddies move,
And beauty kindles into life and love.

How the first embryo-fibre, sphere or cube,
Lives in new forms,—a line—a ring—a tube ;
Clos'd in the womb, with limbs unfinished laves. 15
Sips with rude mouth the salutary waves ;
Seeks round its cell the sanguine streams that pass,
And drinks, with crimson gills, the vital gas ;
Weaves with soft threads the blue meand'ring vein,
The heart's red concave, and the silver brain ; 20
Leads the long nerve, expands the impatient sense,
And clothes in silken skin the nascent Ens.

Erewhile emerging from its liquid bed ;
It lifts in gelid air its nodding head ;
The light's first dawn with trembling eyelid hails, 25
With lungs untaught arrests the balmy gales ;
Tries its new tongue in tones unknown, and hears
The strange vibrations with unpractised ears ;
Seeks with spread hands the bosom's velvet orbs,
With closing lips the milky fount absorbs ; 30
And as, compressed, the dulcet streams distil,
Drinks warmth and fragrance from the living rill ;
Eyes with mute rapture every waving line,
Prints with adoring kiss the Paphian shrine,
And learns ere long, the perfect form confess'd, 35
Ideal beauty from its mother's breast.

Now in strong lines, with bolder tints designed,
You sketch ideas, and pourtray the mind ;
Teach how fine atoms of impinging light
To ceaseless change the visual sense excite ; 40
While the bright lens collects the rays that swerve,
And bends their focus on the moving nerve ;

How thoughts to thoughts are linked with viewless chains,
 Tribes leading tribes, and trains pursuing trains ;
 With shadowy trident how volition guides, 45
 Surge after surge, his intellectual tides ;
 Or, Queen of Sleep, imagination roves
 With frantic sorrows, or delirious loves.
 Go on, O FRIEND ! explore with eagle-eye,
 Where rapt in night retiring senses lie : 50
 Trace their slight bands, their secret haunts betray.
 And give new wonders to the beam of day ;
 Till, link by link, with step aspiring trod,
 You climb from NATURE to the throne of GOD.
 — So saw the Patriarch with admiring eyes 55
 From earth to heaven a golden ladder rise ;
 Involved in clouds the mystic scale ascends,
 And brutes and angels crowd the distant ends.

Trin. Col. Cambridge, (England), Jan. 1, 1794.

SECTION II.

I. Thomas Brown, Esq. who published a large book, in Edinburgh, in 1798, against the *main doctrine* of Dr. Darwin's Zoonomia, admits that there is a *sentient principle*. Mr. Brown, in his book, does not profess himself to be an immaterialist, because he allows that term to be a negative one, and therefore that it means nothing. He professes to be a *Mentalist*—to use his own phrase—or one who believes in mind and in matter. It can hardly be needful to say, that in this belief all mankind agree with him. Mr. Brown denies, however, that we know what that sentient principle is which aids the brain in causing the phenomena of mind. He contends also, that his friend, Dr. Darwin, has failed to prove the sentient principle to be *gaseous or spiritous*. Dr. Darwin himself unfortunately supposed we had no means to prove that principle to be spiritous, but from the evidence of its effects ; but then, he contended, that in such a way its spiritous nature could be abundantly proved ; or, more strictly speaking, he took the fact, now alluded to, for granted. And such has been, at least since he wrote, the opinion among a very respectable portion of medical characters. But there are some

in the profession, like Mr. Brown, who still require or demand, on this subject, more convincing evidence—It is one object of the writer to satisfy such a demand. We have accordingly contended, that there is the evidence of our senses, which no one can resist, in addition to that which has heretofore been given in favour of the doctrine of the spiritous nature, both of the *main* vital, and sentient principle; for the latter is only one modification of the former: and we have also maintained, that said principle is the *halitus* or spiritous part of the blood, and its organic modifications; aided, to be sure, by the red or coarse blood and other agents. We have likewise contended, that said spiritous portion of the blood, or *vital steam*, is, in a greater or less degree, at all times supplied during life by means of a surplusage of blood, constantly kept up for such a purpose; and that too in a state of circulation. We have likewise said that one principal use of the food and drink *taken in are to replenish such waste of the vital principle or powers as is daily occasioned*. We think it also very probable, that *atmospheric pressure*, as recently contended for by Dr. Barry, and by Dr. Carson, may be one principal cause of the sanguiferous circulation, so well known to be, at least in the more perfect animals, the *sine qua non* of animal life.

2. The learned metaphysician, Mr. Thomas Brown, the same person, as we suppose, that was afterwards made Doctor of Medicine, and Professor and Public Lecturer, on Moral Philosophy, at Edinburgh, seems to have believed that he could disprove the very existence of the *spirit of animation*, by exposing the errors and mistakes which had been made in *Zoonomia*; and for such a purpose his book seems to have been written. Such an object, however, could not be effected by such means, however numerous such errors, mistakes, and even blunders, in the detail might have been. Now, had Mr. Brown attended, without an improper bias on his own mind, to the great book of nature as much as he did to that of Dr. Darwin, he might have found evidence sufficient to convince himself of the reality of such a spiritous principle; for, even the unlettered or common part of mankind believe, as

much as did the great Hippocrates and Galen, or even the meek MOSES, that the difference which they daily witness between a dead and a living animal is owing to a vital, or *sentient spirit*. This last position is evident from the very structure of language, and it is perfectly natural that they should thus believe; because the senses of mankind teach them, that the difference which they notice must be owing to a principle too fine to be easily perceived; and to that fine negative principle—negative to them, because the thing itself is not easily perceived—the name of spirit of life, or breath of life, or animal spirit, or some such name, is very properly given.(g) With regard to its *peculiar nature*, many such characters are too wise to trouble themselves, but, very properly, leave such intricate investigations to those who have more leisure and learning; or, as they might say, less wisdom. The learned, however, at least a part of them, are not so easily satisfied; for they demand, with regard to the nature and existence of such a spiritous substance, not only negative but positive proof, derived from the evidence of their senses. This demand it has been one object to comply with. We may be asked, is it possible to prove that the soul or mental substance of an idiot, aside from organization, is the same in kind as that of a Newton or Darwin? To this we admit a negative answer may be given; but then we contend, it cannot be proved what any kind of matter or substance is *in the abstract*.

3. It has been contended by Professor Brown, in his public lectures now published, and also by many others, that the *mind is a substance distinct from the bodily organs,* &c. If the phenomena of the brain be occasioned by such a distinct and independent substance, which is not derived from the brain, as is contended for, that compound organ, or those

(g) An ignorant female, who was gratifying her curiosity by viewing the movements of the heart of a fish which she had just dressed for the gridiron, was asked what was the cause of those movements which she saw? Her prompt answer was, "that they were occasioned by the soul of the fish." The answer, although not quite accurate, was nigher the blunt truth than that which many a philosopher would have given.

organs, if they should be so called, must be governed by a very different law or laws from that of any other organ; and besides, the brain of brutes must be allowed to be governed in the same way. *Such reasoning no one would allow to be correct, if applied to any other animal organ of less importance than that of the human brain.* But Professor Brøwn has evidently had recourse to such a scheme or plan—for by no less harsh name can it be called—because he *falsely imagined* that it would be easier to prove the immortality of such a *distinct mental substance, as he contends for*, than of one more obvious; but it must be evident to every one else, that the immortality of *neither of those substances*, now under consideration, can be proved, at least *in their active state*, upon principles of inductive philosophy—the only kind of philosophy allowed to a physician—and that a different species of evidence may therefore be needed for such a purpose. This last position is allowed to be correct by rational and pious Christians; there is a strong desire in the human mind to continue its own existence. Hence evidence less convincing than that of inductive philosophy is, or may often be, sufficient to occasion the useful and comfortable belief of a *future state*. It can hardly be needful to say, that one must look into the Bible, more especially the New Testament, for such evidence as we are now alluding to.

CHAP. III.

The Outlines of Physiology, or of the Science of Life ; with Notes.

PART I.

In pride, in reasoning pride our error lies,
All quit their sphere and rush into the skies ;

.

Say of the first cause, or God above, or animals(h) below.
What can we reason, but from what we know ?
Of animals, what see we but their station here,
From which to reason, or to which refer ?

POPE.

SECTION I.

1. THE sum of our knowledge respecting animal nature seems to be, that an animal body, including the intellectual as well as the more gross parts, is a compages or family of organs and parts. Dr. Prichard says, "The whole universe displays the most striking proofs of the existence and operation of intellect or mind, in a state separate from organization, and under conditions which preclude all reference to organization." Agreed, as viewed by the human mind. And this makes a characteristical difference between God and man.

(h) The word *animal* has been used instead of *man* in the original.

We hope to shew the difference between man and brutes likewise. Said organs and parts consist principally, although not entirely, of living animal solid matter, and also of vital fluids; and that such matter is, the most of it, less compact and more capable of motion, or configuration, than many other kinds of matter; and possesses, as long as it lives, two principles of peculiar importance, one of which may be called the animal spirit, or vivifying principle, or halitus of the blood; the other animal propensity, or a disposition, including power, in a vital animal organ, or part, to move, operate, or change in a particular manner.

2. Properties in unorganized, or in dead matter, are generally considered as comparatively permanent ones. But in living matter, they are rapidly changeable, and some of such properties appear intelligent; and these mental changes may be infinite, or nearly so. This view of the case makes an important difference between dead and vital matter; or between that which is organized and that which is not so: and these two sorts of matter are governed by very different laws. Living matter may be divided into two sorts, viz. that which is *sensitive* and that which is *irritable*.⁽ⁱ⁾ Irritable matter is found in plants; and both irritable and sensitive matter exist in animals. Sensitive matter consists of a *nervous substance*, in the most perfect animals, and its own sentient or organic spirit and other coarser fluids. Unorganized matter may be changed into that which is irritable, and this last into that which is sensitive; and these two last sorts may change again and become dead. Such variations occur perpetually.

(i) The word contractility is recently used by Dr. Bostock, in his physiology, instead of irritability or excitability. There is no advantage to be derived from this innovation. When a muscle is pricked or stimulated, it contracts to be sure; that its halitus, caloric, &c. does the same is not proved. A more general term, expressive of such a fact, is therefore better. The term irritability applies to plants and every thing that is alive, or capable of being put into organic motion, by external agents, or those which are foreign to the part or organ excited. Excitability expresses the idea of a more lively organic action than irritability. Hence we have the irritability of plants, and the excitability, or irritability, of the muscles, as the case may be.

3. Animal solid, or semi-solid structure, and animal spirit, or its elements, including other fluids and caloric, is the immediate compound cause of animal propensity or vitality; generation is the remote one. This propensity, or *nisus formativus*, is a principle of a higher or more powerful grade than chemical affinity, as has been said in our introduction; for it controuls or governs chemical laws. Vegetable propensity likewise does the same thing. It is curious to contemplate the immense effects occasioned by vitality, or the vital powers, as they control the chemical and likewise the mechanical laws which are noticed in living organization. But when we consider that the infinity of phenomena which occur in the mental world, on this globe, depend on the same compound cause to which we allude, viz. vitality, the mind is nearly lost in amazement. Yet all this is consistent with the known simplicity of the laws of nature.

4. Why animal matter, when alive, whether more or less fluid, or whether solid or semi-solid, should have a disposition or inclination and power or ability to move, act, or change in one way or manner rather than in another, the idea of which is expressed by the term animal propensity, or *nisus formativus*, or active property, is beyond the reach of finite knowledge, and must forever remain so, because such changes are infinite. The reader is reminded that, for want of being aware of such a fact, much useless speculation has been occasioned. This powerful principle is however known to descend from parents to their offspring. We are likewise ignorant respecting the hidden nature of chemical affinity, and vegetable propensity. *It is the laws only of said principles with which we are acquainted.*

5. The animal spirit, or its elements, or halitus of the blood, is to be regarded as a general term for the main vital principle as it is diffused throughout the animal, and as originating from the circulating blood, and as giving, when in connection with solid or semi-solid organic structure and other fluids, and caloric, a general propensity to motion. The animal spirit, when a distinct meaning is wished to be given to a distinct portion of it, may sometimes be called or-

ganic spirit, and the name of the organ or part may be mentioned. Animal halitus, or its elements, when alive, is probably, as well as animal propensity, greatly diversified in the solid organs and flabby parts of which the more perfect animals consist. Animal propensity may be regarded as a general term, including many specific or organic propensities.

6. Animal spirit, or a principle without which animal vitality cannot exist, has its seat in, or originates from, a *particular condition of the blood*, namely, that of its circulation. This position is thus proved: 1. Withdraw all the blood from an animal, or 2. stop its circulation, and all the phenomena of the compound vital principle very soon cease.

7. The existence of the animal halitus is known to *common observers* principally from its effects. The animal halitus may, however, be perceptible to the sense of smell, nothing to the contrary being known, if not to the taste and touch. The smell of different animals is different; so is also the odour of a living and a recently dead animal. The taste of living flesh is different, independent of its warmth, from that of dead flesh; at least it is apprehended that those animals who prefer to eat living flesh would tell us so, if they had both the power and disposition. The touch of living flesh differs from dead, aside from the variations of temperature. Dr. Good states that a certain monk acquired the faculty of distinguishing by the smell the perceptible difference of the spiritous odour of the two sexes among mankind; and likewise the different ages of different persons, i. e. whether they were young or old. Others, doubtless, might do so likewise, if they were to cultivate such a propensity. It is immaterial whether the animal halitus be separately tasted, felt, and smelt, or whether it only occasions the difference just considered; in either case the existence of that vapour is proved. There are phenomena visible which likewise shew the existence of said spirit, and that it possesses more power over the solid or semi-solid organs of the same animal at different times. It has likewise a nocturnal accumulation and diurnal expenditure, at least so far

as respects its power. It is evident that the excitability of all the animal organs and parts depend on their organic spirit, in combination with their solid structure and other fluids, and caloric; for there is no excitability in a solid or semi-solid organ, or soft part, when dead. The facility, ease, and astonishing rapidity with which animal motions are performed, depend on this very important principle. That there is a hidden and invisible spiritous principle, that aids in moving the solid and semi-solid animal organs and soft parts, and that likewise gives them sensibility and excitability, it is apprehended *should never have been disputed or called in question.* Although, from a principle of respect towards our opponents, we have just called the main vital principle a hidden and an invisible one, yet we think that it is shewn to be a perceptible one, to at least some of our senses. The very ancient name of animal spirit, when a general term is wanted, unless the name of halitus or steam should be adopted, is thought to be a suitable one for this very interesting principle. When a specific name is wanted for a part of it, it may be called either organic spirit, or sentient spirit, as the case may be. Other names have been given to the *same principle*, the *anima* of Stahl, for instance; but to some of these there are objections, which will be pointed out in the second section of this essay. The peculiar animal odour which is very near the person of a maniac, especially when first awaking in the morning in an ill-ventilated bedroom, is so strong as to enable a skilful person to distinguish with considerable certainty a feigned case of mania from one that is real. See Mr. Hill, as quoted in Beck's Medical Jurisprudence. The configuration of the coarse and fine matter of the brain, and likewise other parts of the system, in the two cases alluded to, must of course be very different. Cannot insanity be thus accounted for, without supposing so much organic derangement of the semi-solid or pulposus part of the brain, as to render the cause always visible to the anatomist in case death happens to the patient? Coarse minds, and those who choose to deal in mysticism, may regard the above as visionary.

8. It is highly probable that materials for the animal spirit, or steam, or its organizable elements, are supplied by the blood most plentifully to certain moveable parts which are at a distance from the heart. Hence the brain, organs of sense, including the skin, and also the organs of generation, possess more sensibility and excitability than the more central parts. A surplusage of such matter also probably occasions the growth of those solid vegetables or semi-vegetables, which are called hair, wool, feathers, scales, teeth, horns, &c., which grow on animals. This conclusion is rendered probable from the circumstance, that such half-vegetables are found most plentifully, and likewise grow to a greater size, on and near to parts which are the most sensible. Teeth and hair sometimes exist in the ovaria of females; this curious fact shows a strong tendency in animal organizable matter to form such substances. There is a curious contrast between the torpid irritability of those partly vegetable beings, which grow on animals, and the vivid excitability and very acute sensibility of the parts from which they proceed.

9. A few words on the animal, or rather organic active properties or propensities, using the word propensity in our enlarged sense of it, for they are innumerable, must suffice. The semi-fluid organ, the eye, aided by its organic spirit, caloric, light, and other fluids, has a propensity for seeing, almost, if not quite, independent of the voluntary power of the brain. Indeed, it is doubtful whether the voluntary power at first in a new-born infant, when awake, has strength sufficient to prevent the eye from seeing. The above sentiment, by the by, might have been expressed by simply saying, that it is natural for the *living* eye to see; but we have reasons for doing differently, not now to be mentioned. It is not proposed to treat of the *modus operandi* of the vital solids, fluids, and organic spirit, or halitus of the eye, or of any other organ or part, because such mode is incapable of explanation; neither does it come within our plan to treat fully of light, and many other agents, that operate upon animals.

The ear has a similar propensity to that of the eye, only the organ is made for hearing. The other organs of sense

have their peculiar propensities, or what has been called *via propia* by Prof. Blumenbach. The compound, tremulous, and warm living brain, when aided by its sentient spirit, caloric, and likewise by other fluids, has a propensity for sensation, for reflection, in its most perfect state; for volition, for knowledge, for associating ideas together, for hope; and it is assisted in gratifying its propensities or wishes by the organs of sense. The brain cancels its obligations to the organs of sense, by being useful to them in its turn; for each are needed by the other. Some of the intellectual propensities have been called instinct. The vital pulpous brain has a propensity to control or govern the voluntary muscles; and those muscles readily submit to such government, unless too severe. (*j*) It is natural for even the voluntary muscles to be in motion, for they are often excited into action by the uneasiness of quietude, especially in childhood; and this is sometimes done almost independent of the brain, for it takes place in sleep. The muscles require rest also, when fatigued, especially in old age; and they will often have it too, in spite of the brain, because a renewal of their organic spirit is necessary to their exertions.

10. The hollow stomach, when aided by its own healthy organic halitus and very important gastric juice, &c., has a propensity for stimulative food, called appetite, and that, too, independent of the brain. This appetite is so strong as to force the brain to take measures to supply the wants of the stomach, during the whole period of the compound animal's existence. The stomach, like a wife, has more power at home than any other organ in the whole family of organs

(*j*) The submission of the muscles to the power of the brain is sometimes astonishingly great. The voluntary power of the brain can be extended to muscles which are not usually subject to such influence. This is the case with a Dr. Roget of London; he can contract and dilate the pupil of his own eyes at his pleasure. See Travers on the Eye. Others have possessed, as we are told elsewhere, the faculty of controlling as they choose, even the motions of their own heart. Some persons, like horses, can move their ears; rope-dancers, and those artists who perform feats and novel exhibitions for the public amusement, also acquire unnatural, and sometimes astonishing powers over their own muscular systems.

and parts ; and it should be so, for the whole animal mass is very dependent on this very important part. (k) The hu-

(k) From a highly interesting manuscript, a part of which has been published, loaned by my venerable friend, Dr. Swift, the subsequent very important account is taken. Dr. William Baumont, of the U. S. army, had a large athletic youth, 18 years old, for a patient, who had a fistulous perforation between two of his ribs, leading directly into his stomach. This hole was the sequel or consequence of a most horrid gun-shot wound. The food constantly passed out at this hole, unless a suitable plug was made use of; but a plug, if made of raw beef, was digested, transversely off in five hours by the gastric juice.—Two years after the young man was perfectly cured of his very dangerous wound, with the exception of the fistulous opening, to which we now allude. His ingenious surgeon, in the first place, introduced the bulb and glass part of a thermometer into the young man's stomach, which he could do with harmless facility; for the doctor says, that he could easily see directly into the cavity of the stomach, when the defensive dressings and plug were removed; and thus it was ascertained, *probably for the very first time in the annals of medicine, that the healthy temperature of the human gastric juice is 100 degrees of Fahrenheit's thermometer.* The temperature of the human vital blood is 98 degrees of the same thermometer.

The Doctor, in the second place, procured, by means of a gum-elastic syphon, about one ounce of the youth's pure warm gastric liquor, which was then carefully kept equally warm—if not equally alive—in a vial, by means of a sand-bath, between ten and eleven hours. In the third place, two bits of beef, which were alike, were subjected to the very important process of animal digestion; one of them was put into the vial alluded to, the other into the patient's stomach, which was fasting or hungry at the time. This was done by putting the meat through the stomach's fistulous hole by the aid of a string, so that the beef might be withdrawn at pleasure for inspection. Both of the bits of meat became well digested, i. e. so well as that important process could be done by the gastric juice, or the stomach alone, within about ten hours, and that in the stomach considerably sooner, namely, in about two hours. In other respects the phenomena, which were carefully noticed, were very similar in the two experiments.

These well devised experiments prove the gastric juice to be not only alive, or to possess vital properties, but that such a fluid can be kept alive, or those properties preserved, at least a certain time, by artificial management.

The gastric juice obtained by Dr. Baumont was clear, and almost as transparent as water; but it let fall a fine sediment in a few minutes, when at rest, of the colour of the meat that was put into it.

Other experiments were made by Dr. Baumont on his patient, all of which

man stomach, like the human brain, is capable of greater alterations, from education or habit, than that of other animals. In this respect mankind have a great advantage over the brute creation. In illustration of this fact it may be observed, that the stomach of a Dutchman, of a Frenchman, of an

tend to confirm the very important and well known doctrine, respecting animal digestion, as taught by Dr. Stevens, the Abbe Spallanzani, and likewise Mr. John Hunter.

Dr. B. says he could feed his patient through the morbid perforation conveniently with a spoon, and likewise give him drink with a funnel; and could easily extract those articles again with a syphon if he chose. He could see the process of digestion going on. He once gave his patient, when a little unwell, medicinal pills through this opening into his stomach, and with benefit.

The surgical and first part of the Doctor's case, although highly instructive, we have omitted, because that part of the history has not a direct bearing upon our subject.

Mr. John Hunter first ascertained that the human gastric juice, sometimes, outlived its own stomach, and then eat or digested holes through it, probably for want of better meat, after death.

There is a mutual connection, and likewise a mutual dependence, between the stomach and its gastric juice; and each perpetually helps to create or form the other. Both must be in health, otherwise the whole animal microcosm, or congeries of mutually dependant beings or parts, cannot long remain so. Hence dyspepsia should be treated with great attention. In case too much of the compound animal spirit and other fluids be expended or exhausted by voluntary efforts, whether those efforts or actions be mental, bodily, or sexual ones, or all combined, the digestive powers are injured, and the whole animal mass gradually becomes diseased, or prematurely worn out.

The human gastric juice accumulates, so as to want food once in three or four hours, and during childhood oftener; for the latter require liquid food, i. e. water, very frequently. In illustration of the sentiment respecting the accumulation of vital fluids for use, it may be observed, that the semen in adults, during their greatest vigour, wants to be naturally employed, when it can be consistently with good morals. The sentient spirit accumulates in eight or nine hours by sleep, so as to be useful fifteen or sixteen hours afterwards, or even longer as the case may be. The semen, as well as the gastric juice, can be kept alive out of the body for a limited time. And why may not all the animal fluids possess vital properties, as contended for by us?

Englishman, and of an aboriginal savage, are educated or managed very differently, as well as their brains ; and dyspepsia and other complaints may require different treatment in consequence thereof.

11. The other internal viscera have their peculiar propensities ; for instance, the liver has one for secreting bile. This propensity, too, is independent of the brain or mind. The colon and rectum have the active property of changing the nature of their contents, and giving them the well known fetor which they possess, and afterwards expelling them as useless. The bladder has a variety of propensities, among which one is to expel useless matter. The brain aids, however, in this case. The female gravid uterus gradually acquires the active property, and when it is needed, of expelling a full grown foetus, or infant child. The mind or brain can, however, aid in this very important process ; and no good reason, as a general rule, aside from that of fashion, can be given, why a full-grown infant should be separated from its placenta previous to the expulsion or extraction of the latter. Such an operation can be more conveniently done subsequently ; and it might then often be done by the mother of the infant, or any other suitable friend. Civilized women are not, however, in general, athletic enough prudently to help themselves and offspring in this manner ; a savage one might do so. This opportunity is embraced because another may not occur, to say, that we are satisfied that ergot not only occasions *a sort of intoxication* of the womb, but likewise affects the foetus in the same way, through the intervention of the organic vital powers. This intoxication, if such a term may be used, may be so powerful as to kill the infant *in a direct manner*, unless it is very soon born. Hence great caution is needed in relation to this drug. We are aware that this is not a fashionable mode of accounting for the action of ergot. Why may not ergot intoxicate the womb and its foetus, and to such a degree as to occasion the death of the latter, as well as rum or opium the brain ?

The plastic sanguiferous system has a powerful and active disposition, or appetency, for chyle to make blood. The sensitive nervous system absorbs, or takes up, or selects, by a sort of appetency or pith-like power, an abundance of the elements of, or materials for, the animal spirit, which is changed or modified into organic spirit ; which spirit is likewise more or less sensitive as the case may be.^(l)

The materials for the animal spirit to which we allude are proved to be the finer parts of the blood, or its halitus, by the experiments to which we have alluded in 6th paragraph, and likewise in our Introduction ; at any rate, those experiments prove that the phenomena of the nervous system, including mind, cannot exist without the active aid of the *circulating blood*. For other arguments in favour of our doctrine respecting the animal spirit and its materials, see our Introduction and other parts of this work.

12. Distinct animals have different propensities, so also have the different senses of the same species of animals, strongly marked at times. The active or vital properties of the same animal vary at different periods of its existence. Two animal propensities existing in the sexual organs of two different beings—as a general rule—and two voluntary powers found in the same beings, all acting at once, produce a new being, having the mixed propensities of the parents. Animals of a different species have, very fortunately, a sexual antipathy towards each other ; and likewise a mental one. Hence we see no mules among animals in a state of nature. The ingenuity or selfishness, however, of mankind has contrived ways and means to overcome both those antipathies, to which we allude ; this is one source of the power which mankind have obtained over the brute creation.

(l) The nervous system, including the brain, is, however, limited in its power of changing the animal and its organic spirit. Such spirit, when made from new whiskey, is much more fiery in regard to its perceivable operation, than when made from bland bread and milk, or rice.

The chief or first cause of life on this globe is the generative power. To this cause all living propensities can be traced, whether such propensities be bodily or mental ones; or those of plants. Hence the naturalist, who is fond of every thing that lives, pays great veneration to this immense cause, although it is not the omnipotent one. (*m*)

(*m*) That which, in a desultory view of the case, may be contemplated as a double sexual organ, equal parts of which are attached to different animals, is capable of occasioning very great and likewise very durable effects. It is wise that this organ is put under the prudential direction of two beings of different propensities; the social disposition and other good effects are increased thereby. For wise purposes it is ordered, that the relative proportion of the two sexes, to be born, should not depend on the caprice of parents. Probably, for equally wise purposes it is designed, that the future being to be produced should possess, during life, a mixture of the propensities of the parents; and that, too, in spite of cultivation. The truth of the last proposition is known to every one, especially to those who breed domestic animals. Such truth is well exemplified by the attempts which have been made to civilize the natives of this country, for they are prone, sooner or later, to fall back into the nature of their parents. The same principle operates among different sorts of people, in common society. The tendency to resemble parents gives the latter great power over their offspring; and were it carefully attended to, the human species, as well as domestic animals, might be greatly improved. Such a cause in some countries occasions a natural aristocracy. In confirmation of the opinion respecting the inherent and almost unalterable power of the organic propensities in general, the reader is reminded, that even castration does not entirely deprive animals of the sexual inclination; this position is made evident by observing the occasional movements of the common ox.

Although the continued existence or succession of animals depend, in general, upon two beings of different sexes, yet there are exceptions. The successive existence of the domestic bee, or honey fly, is accomplished by the aid of three beings, all having different parts to act, viz.; the queen bee, the drones, and the common working bee. The astonishing propensities, commonly called instinct, of bees, have excited great attention from the curious in every age; and even man himself, at least when half or partially educated, ought to bow with profound deference to the superior industry, economy, minute sagacity, political harmony, and nice general management, existing and observable in a community of bees. Mankind, like bees, have a sexual peculiarity; namely, each sex might assist the other in the business of lactation; provided they were educated to do so.

Although the mental propensities of bees, and likewise ants or pismires, operate, on the one hand, upon a vastly more limited scale than is the case with man; yet, on the other hand, they operate with far greater nicety.

13. The phenomena of the most perfect animals show that the stimulative matter, taken in for their nutrition and excitation, is subjected to, or undergoes constant transmutations, until a part of it is incorporated with the solid, or semi-solid animal, for its growth and repair. Another part remains in a fluid state; and some of it is changed into animal spirit, and into that which is sensitive, to give volition, activity, and motion, in some measure, to the whole animal mass. The remaining part is thrown out of the body, some to nourish those vegetable beings which live on animals, and some as useless. Nutritious matter taken in by animals is prepared for such changes, as have just been considered, by having been previously organized.

Although it is a law of nature, that animals prey upon organized vegetables as well as upon each other, yet there are exceptions even to so general a rule; for some few plants prey upon animals, and their well-being requires that it should be so. Such is the case with the living fly-trap (*Muscipula*). Flies are decoyed within its grasp by a peculiar apparatus of its flower, and are killed or die for the benefit of such flower. Such a propensity in a plant has some resemblance to that faculty, or propensity, in an animal, called fascination.

The food of bees, and some other small insects, consisting of the most delicate and highly organized matter, may, in part, occasion the active and wonderful nice mental capacity which such insects possess. Such capacity is owing to the peculiar delicacy of their sentient spirit and organization. By the by, a somewhat similar nicety of the sentient spirit and organization, although upon a vastly more extensive plan, may be needed to support the highest order of talents in human beings.

The sexual organs, as well as the mental ones, rank higher in the scale of creation, or are more frequently used, in human beings than in brutes. The sympathy between the mental and sexual organs is likewise probably greater or more frequently active in mankind than in most other animals. Secrecy in the sexual intercourse is believed to be peculiar to mankind, or nearly so. The seed of animals, like those of plants, can be kept alive out of the body, at least so says Spallanzani, a limited time. The vital gastric juice is necessary to the very existence of the animal, and the living semen to the existence of the species.

14. Most of the animal organs perform double functions, and each one is subservient to some other; and, like the male and female screw in mechanics, each is needed by the other. A circle, chain, or family of organs and parts, is thus constituted; at the head of which in power, is the brain, and nervous system, or *the stomach*. The stomach and digestive apparatus has the most perpetual and needful power, as respects the whole compound animal; but the human brain, like an husband, has immense power over other animals and things, as well as at home.

15. The thinking brain, according to Drs. Gall and Spurzheim, is an assemblage of organs, or a compound one.⁽ⁿ⁾ The

(n) The reader is reminded that there are 33 or 35 organs, or diverging prominent parts of the human brain, so far as they are now ascertained by Dr. Gall. These parts act somewhat like the wheels of a watch, or other immensely more perfect engine, in the process of thinking, with greater or less vigour, so long as they are supplied with a sufficient quantity of vital fluids, and other vital powers, viz.; the sentient spirit, caloric, oxygen, &c.

The pulpy organs, or soft mass of the brain, grow from the medulla oblongata towards that hard animal shield, commonly called the bony cranium; then their further growth is limited, and likewise protected, by such a provision of nature. The thinking extremities of those pulpy organs form their covering. It is not, however, known for certain, that the circumference of the brain is more active in thinking than the other parts of the same compound organ; analogy, however, would occasion the belief that it is so, except in very old age, when the circumference of the whole body becomes partly callous.

An individual is not conscious of even the existence of such a number of thinking organs or parts, for he cannot see them, while alive, either in himself or in others. Hence the necessity of the study of anatomy, fully to comprehend the science of metaphysics; and that of education, as well as that of medicine. The natural dread of dissecting the human brain has kept mankind in ignorance on these subjects for ages.

The thinking apparatus is gradually developed, and acts very differently, during the various periods of life. This apparatus, like other animal organs, can likewise act when even organically diseased, or partially worn out, or nearly destroyed; besides, we have two brains as well as two eyes. The mental apparatus being double, is a wholesome provision of nature against disease or accident. The sentient spirit produced by such a compound organ, must likewise be more abundant than otherwise would be the case, and

well-being of all the other organs and parts, and likewise its own well-being, depend through life upon the correct, wholesome, controlling, and providing power of the brain. The intelligent brain, being endowed with the social principle, has great power, as has just been said, over every other sort of matter, whether it be thinking matter or not. This function of the brain is of a very plastic and yielding nature, owing probably to its organic spirit, and other fluids and solid structure, being more highly animalized than the more gross organs.

16. There are phenomena to show that the animal, or organic spirit, may be increased in power, in a particular organ, by the management of an individual. Long continued exertions of the thinking brain increase its energy, but at the same time diminish the force of the muscular system, and impair the digestive functions; so, on the other hand, muscular power is increased by manual labour, and mental energy or activity diminished. Long life and the health of an individual require that there should be maintained a proper equilibrium of the vital or organic principle. For want of the information now imparted, or the prudence which it dictates, many ingenious young men become premature tenants of the grave. Middle aged and old persons may likewise suffer in the same manner. The inferior animals are not so liable to suffer, in

must operate as a connecting medium, through the whole medullary mass, and occasion a present consciousness of unity in relation thereto. One sometimes sees the sentient spirit so powerful, in an old animal, as to occasion other parts to act as a substitute for a brain that has become ossified, or partly so. Such animal exists in an imperfect state, for a short time.

The cranium grows into various shapes in different animals, and among mankind. When one sees the dried skull of a man, a sheep, and a horse, he at once is reminded that those bony boxes or caskets once contained a thinking mass of very different mental capacity. This constitutes a coarse kind of the study of Craniology.

We have now given an outline of the persecuted science of Phrenology, with some additions of our own, so far as we understand that science. Justice, however, compels us to say, that we have not attended to it so minutely as many persons have done.

this way. The close thinking brain needs much sleep. The intemperate use of the animal spirit, considered as a unit, occasions a more destructive havoc *insidiously* among mankind than is produced by the more *obvious abuse* of spiritous liquors. No justification for the abuse of the latter is, however, to be taken from us. Medical societies seem to have forgotten, that they should warn mankind against the former evil as well as the latter; indeed, it is more necessary, because there is less known on the subject.

17. The social principle of an individual, especially when young, owing to a propensity to imitation and other causes, is very much under the control or government of the body politic of the species to which the animal belongs; and that principle is capable of being moulded by education into such a shape, as the body politic, or society, for its own good, or through habit and fashion, may direct or require. Hence arise (the animal propensities having their proper influence) all the modes of government, languages, human religions, systems of morals, fashions, customs, &c., found on this globe; the more powerful govern the weaker, and the many the few. Among mankind, the men pretend, in private life, to govern the women and the children; but both the latter often rule the former, and often to the injury of society.

But in our physiological peep from another planet, it is not proposed to say much respecting any particular form of government or religion which we may find on this globe, lest we might give offence to some party or to some individual.

18. We hope the reader will have patience with us until we have shown what an important difference there is between animal and vegetable vitality. The brain, including the *spinal cord*, the organs of sense, and the nerves, may be viewed as an appendage, or one large compound organ, or an assemblage of organs, which have been added to an animal body to help to continue the existence of an animal a given time; and likewise for the very important purpose of constituting the intellectual world on this globe. How it may be in other places, does not come within our province of inductive philosophy; but faith,

or belief, kindly helps us in such a difficult case. The sexual organ is wanted to continue the existence of the species. Such an appendage as a brain and nervous system, and highly sensitive organs and parts, are not needed by vegetable beings. A plant has its food, or means of support in its own immediate vicinity. Locomotive faculty is not, therefore, in general, wanted by such vital beings; but with animals the case is different. There are, however, exceptions. To give animals the power or propensity to move from place to place in pursuit of food and pleasure, and likewise to avoid pain, both sensibility and locomotive ability are added. Such powers or faculties originate from the nerves and brain, or, in the very lowest grade of animals, from other sensitive matter (the Zoophytes, for instance,) aided, to be sure, by the muscles and limbs, and organs of perception. Animals, however, during the first stage of their existence, have no brain, because such an organ is then not needed; at least, this is said by high authority to be the case with the human fœtus, during the very first month of its existence. The curious reader may see an account, recently republished in the *American Medical Review and Journal of Philadelphia*, vol. m. page 26., of Prof. Tiedemann's Researches respecting the Fœtal Brain.

The sentient apparatus in human beings, and likewise in other animals, is much sooner developed, and, fortunately, continues in useful existence during a much longer time, than is the case with the sexual one; for a female, in a healthy or temperate climate, may live eighty-four or more years, and yet not have the sexual organ so perfect, as to be capable of bearing children more than about twenty-seven years, during that long time. With men, facts of a similar description are not so accurately ascertained.

It is now pretty well ascertained by the curious French physiologists, that the trunk, or the parts within the trunk, such as the digestive organs, the heart and large blood-vessels, including what should be called the spinal brain, are the parts which grow first, or are first made visible, in the human fœtus; that the head or superior brain, eyes, and other organs

of sense are next developed, or made perceivable ; then the limbs or the extremities ; and, last of all, the genital parts. These last are not developed in full perfection in man, until several years after birth, neither are the internal mental organs ; for there is an intimate connection between these two sets of organs or parts.

It is likewise ascertained that the nerves, or nervous twigs do not first begin to grow from the spinal medulla and brain, as has heretofore been supposed ; but that they grow towards and finally terminate in those parts, being progressively enlarged, and likewise united, as they arrive at their place of final destination. It is also noticed that local enlargements of the spinal, and the other, or superior brain, are developed at a time when such enlargements are wanted for the convenient insertion of nerves. Hence the nerves may be regarded as intermediate parts, possessing, on the one hand, properties useful to the superior or cranial brain, and also to the inferior or spinal brain, and perhaps to the ganglions ; and, on the other hand, properties useful to the organs of sense and other sensitive parts.

If, when this science becomes more perfect, the brain and spinal medulla should be hereafter regarded as one compound organ, or a community of organs, then the nerves might be regarded as so many *distinct organs*, or double organs, each having its own function to perform.

There may be two or more sorts of nervous matter, viz. one for sensation, one for motion, and one for respiration, &c., as first proved by Mr. Charles Bell, if not others. See the Edinburgh Review for 1828 ; also Bell's Works. In confirmation of such a doctrine the subsequent history is added. We have ourselves known a patient who suddenly lost the power of motion, both in his right arm and in his right leg ; and by the same fall and concussion of the spine, he as suddenly lost the power or faculty of feeling in his left leg. This patient partially, although not entirely, recovered those two faculties after the lapse of a number of months.

The subsequent definition is from the great Dr. Johnson.

“ There is a threefold division of a *palsy* : a privation of motion, *sensation remaining* ; a privation of sensation, *motion remaining* ; and a privation of both together.” See his Dictionary. From this it is evident that Dr. Johnson, although not a medical man, was aware, as well as the celebrated Mr. Charles Bell, that the parts for sensation and motion were distinct ones, and that each might be deranged in their functions. Van Swieten says, that “ Senac had a patient who lost all power of motion in one arm, whilst the most exquisite sensibility remained in it ; *and was at the same time deprived of all sensation in the other arm, whilst the power of moving it was unimpaired.*” Dr. Cullen considered a loss of motion as more common, than a loss or injury of sensibility in cases of palsy. The preceding remarks are not given to lessen the merit of Mr. Bell’s curious anatomical investigations respecting the nerves, but to illustrate the subject, and in confirmation of his accuracy.

Useful inductions may be made from the anatomical, or physiological fact now under consideration.

A person, on the one hand, whose sensitive and perceptive organization is naturally better, than that which is useful to him for motion, is the fittest person found among others for mental employment ; while, on the other hand, one whose organs for motion are the most perfect, is a suitable person for bodily labour. A due proportion of such organs, or parts, in each individual as is now alluded to, is the most common, and, upon the whole, the most desirable ; and they can be modified by education and habit. We are aware that such remarks may be regarded as visionary by some of our readers. We maintain, however, that there is a foundation in nature for them ; and that such sentiments can be made useful in the business of education, if not in physic. It may be mentioned, if it can be done without exciting the risibility of the reader, that we cannot with propriety employ Mr. Charles Bell, to ascertain by his nice anatomical knowledge, the relative proportion of the nervous matter of perception, and that of motion, which may exist in our living children.

We can, however, observe their natural propensities, and thus form an opinion whether they be made most suitable for sensation and thought, or whether they be most proper for action, or manual labour, and then decide what employment is best for their usefulness ; and not leave so important a decision to be made by chance, or caprice, as is too often the case.

If the CEPHALO-SPINAL fluid, which is supposed by Mr. Magendie to be one of the natural humours of the brain and spinal cord, is warm enough, while alive, to occasion a halitus, or to be the whole of it in that state, then such spirit might be supposed to fill all the cavities of the brain and medulla spinalis. This would prevent such a *flux* and *reflux* of that fluid, as is supposed by Mr. Magendie to take place. See Philadelphia Medical Journal for 1827. Dr. Bostock says that Soemmering finally fixed, although improperly, upon the halitus or fluid in the ventricles of the brain as the primary seat of sensibility.

We recollect having had shown to us, in the fore part of the year 1795, by the then venerable Dr. William Shippen, one of the principal founders of the first American Medical School in Philadelphia, in his hasty dissection of the human brain, a little thing called the pineal gland. We have likewise recently seen a representation of that gritty thing,—the use of which is unknown—in a very good wax figure of the human brain. These facts are mentioned, because this gland has been supposed by grave philosophers to be the seat of the human soul. This ridiculous opinion shows into what wild vagaries even the minds of grave men may fall, when they suffer their imaginations to rove at random, as was once too much the case. Great improvements have been made in the anatomy and physiology of the brain, since we attended Dr. Shippen's lectures.

Those who are well acquainted with Dr. Dumas' doctrine of the two lives (as taught by Bichat) and with other French physiologists, will find no difficulty in comprehending what is contained in this long and tedious paragraph. Durable

fame has been obtained by Bichat, by teaching the important difference between animal and vegetable vitality.

The nervous system, or the matter in animals of that sort, *grows*, by the aid of its roots, twigs, or otherwise, from, or in close connection with, the sanguiferous system, as vegetables do, by their roots or twigs, or otherwise, from the earth or other substances. Vegetables draw from the earth, or other substances, by a sort of sponge-like, or pith-like power, materials for the solid, fluid, and spiritous parts which are found in their composition. The nervous system, in like manner, and probably by a similar sponge-like, or pith-like power, or selective appetency, *draws* materials for its semi-solid, fluid, and spiritous matter, from the circulating blood, in the sanguiferous system.^(o) Thus the former system is dependent upon the latter for its very existence and perpetual support; but highly active mind, which results from the nervous system, is needed to supply food for the support of the blood, as well as for many other social, self-protecting, pleasurable, useful, and generative purposes.

Instead of saying, as Dumas and Bichat did, that an animal has two lives, we should say an animal had three important parts, one rising above another in point of *social* importance: viz. 1. The digestive apparatus, including the urinary one; 2. The sanguiferous system, including the respiratory apparatus, as an appendage to that system; 3. The nervous system, including the brain in its largest sense. To

(o) In illustration of the sentiment meant to be conveyed to the reader by the expression pith-like, or sponge-like power, the subsequent explanation is given. Pithy, spongy, or pulposus vegetables grow, or absorb their nutriment, by the configuration of suitable matter. The configuration in plants, and likewise in animals, may be occasioned by chemical affinity, vital action, and mechanical laws, such as atmospheric pressure. The *modus operandi* of these powers are infinite; of course, an explanation of them cannot be expected by the reader. There is a sort of *appetency*, *perceptibility*, and *voluntarity* existing, as vital active properties, in plants and in animals. These active qualities exist in low degrees in plants, and in all degrees in animals.

these may be added certain useful appendages, as, 1. The sexual organ ; 2. The muscles and limbs, or other apparatus with which the animal may move about, and for other purposes ; 3. The organs of sense, and likewise the organs of speech or signs, as very useful assistants to the mind or brain, for social, pleasurable, and other useful purposes. Many other parts are made as assistants, and for protection to the more important parts now alluded to.

Although Dumas and Bichat's distinction between vegetable and animal vitality is an obvious and useful one, considering animals as having sensation and mind, and plants as not having those qualities, yet another view may be taken of the subject by the curious : Vegetables have heads and fruit, like grass and grain, and nice pulpy and spiritous matter in them, like, or somewhat similar to, that found in the heads of animals ; the seed, however, is located in these heads, or fruit of plants ; it is not so with animals, their seed being placed differently. Vegetable beings, like the vine, which is a creeper, although not a crawler, have a latent power like a hidden voluntary one. There is a latent disposition, or propensity in plants to exist, and likewise to grow in a particular manner, and to leave a progeny for the continuance of the species, analogous to what occurs in animals. Such insidious qualities in plants become, in animals, very conspicuous ones. Vegetable beings, like animals, are sometimes intemperate, i. e. they will receive either too much, or not enough of food, or the supports of life, for their best possible well-being, according to the circumstances in which they may be placed. Is there no faint resemblance to a voluntary propensity in this view of the case?—which active property, the reader knows, is one quality of mind. The curious reader need not laugh, or smile, at the comparison which has just been made between the intemperance of animals and that of plants ; for, as a philosophical farmer, on the one hand, and as a practical physician, on the other hand, we know, that the comparison alluded to, is a correct one. Every thing that is alive appears to the *curious observer of what is around him* to be a congeries of vital matter, more or

less mental. See Dr. Darwin's Works. Such characters as are now alluded to, are, by the by, in imminent danger of being regarded as visionary by coarser minds. One, in taking a peep from another planet at this earth, sees another class of curious men, called metaphysicians, sitting at their ease, in elbow-chairs, for want of something better to do, contemplating and arranging the movements of their own brains *only*, into systems of mental philosophy, without interrogating nature abroad, as much as they should do. Hence much jargon or error has been produced.

Such nice views of vegetable nature ought not, perhaps, with a view to usefulness, to be encouraged, except by those who direct the affairs of men. There is, however, one benefit, which occurs to us, just at this moment, to be drawn from such views, namely, it may show that public laws, protecting vitality from the infliction of pain, may as well be limited to human beings, as is now the case, as to be extended downwards in relation to domestic animals, as is contended for by some. There must be a stoppage somewhere; and the coarse common sense of mankind is often more useful, than that which is finer, in deciding many things to be done. If it would be *right* to punish a man for abusing his horse, as a *great* criminal, as is contended for by some persons, would it not be equally proper to chastize him in a less degree for abusing a vegetable being? A ridiculous idea will often convince one of an error better than an argument.

Such remarks as have been made may tend also to lessen that unpleasant state of doubtfulness and mysticism, too prevalent, in relation to animal or human vitality; for it is allowed that vegetable vitality is the result of the organization of matter which is both coarse and fine.

To render familiar to the tyro reader our sentiments respecting vitality, the following remarks are borrowed from the American Medical Recorder:

“Metamorphosis of vegetables into animals, by M. Gailon.—It has been ascertained by several naturalists that a great number of the *confervae* are disorganized during summer, and that the greenish globules become animalculae,

which swim for a certain period in water, are susceptible of irritation on being touched, &c. &c., and at the end, reunite themselves to form new *confervae*.

M. Gaillon, in his new Memoir, presented to the Institute of France, has made observations which fully confirm those previously made on this singular order of beings, which seem to destroy all traces of distinction so feebly marked between the animal and vegetable creation. The species to which he has applied his researches, is the genus *ceramion* of Decondolle. Dillyn has described them under the name of *confervae comoides*. They cover the mud on the sea coast at Dieppe. The corpuscles, which are of a greenish colour, M. Gaillon has observed, leave the filaments of the *confervae comoides* at frequent intervals, and, assuming the form sometimes of an oval, sometimes of a parallelogram, move about slowly or rapidly, and change their direction like *cy-clades* and other animals of that class. He has even forced these corpuscles from their filaments before their time, and observed the same phenomena. M. Mertens, a celebrated botanist in Germany, has made the same observations. Last year he exhibited to several *savans* the *confervae mutabilis*:—on the 3d of August, in the form of a plant; on the 5th, disorganization, in the form of molecules, possessing the power of loco-motion; reunited on the 6th, in the form of a simple articulation; and, on the 11th, constituted again in the primitive form."

Dr. Ehrenberg discovered that the red colour of the Red Sea is owing to small animalcules, that hold a rank midway between plants and animals. See *North American Review*.

In the harbour of Mahon, in the Mediterranean, according to Mr. Jones, there are coraline animals, called *water pinks*; "and the bottom of the harbour is covered with tufts of grass, some green, some dark coloured, some in plain tufts, and others with a star in the middle; this grass too, is all animal, and if you touch it, will disappear in the ground."

The idea of men and other animals possessing two or more sorts of matter; namely, one that is irritable, like plants, and one that is sensitive like animation. occasioning mind, is not

particularly marvellous. That amphibious animal, the beaver, is equally curious in its bodily structure: the flesh of the superior part of its body resembles, in its nature, that of land animals or quadrupeds; and, on the other hand, the flesh of the inferior part of its body is like that of fish. In evidence of this fact, the subsequent account is taken from those who have attended to the subject. "During the greater part of the day the beavers sit on end, with their head and anterior parts of the body elevated, and their posterior parts sunk in the water."

"The continual habit of keeping their tail and posterior parts of their body in the water, appears to have changed the nature of their flesh; for that of the anterior parts, as far as the reins, has the taste and consistence of the flesh of land animals; but that of the tail and posterior parts has the odour and all the other qualities of fish."

"The tail, which is a foot long, an inch thick, and five or six inches broad, is a genuine portion of fish, attached to the body of a quadruped: it is wholly covered with scales, and below the scales with a skin perfectly similar to that of large fishes." See Daniel Adams and Smellie; likewise beaver skins.

19. It is the business of the physician not only to make himself acquainted with the laws of organized life in their healthy or natural state, whether they be more or less mental ones, but likewise to become well acquainted with any derangement of those laws constituting disease; and of all disorders, whether those disorders be of the body, or of the more important part, the mind. The moral means employed for the diseases of the mind are, to be sure, a different species of agents from those used for bodily complaints, at least some of them. No good reason can be given why medical men may not be as competent to manage diseases of the moral world as others, in case they were to attend to that branch of business.

A physician, when called to a patient, should investigate what organ or number of organs, or parts, are deranged, either in structure or function; for the function of an organ or

part may often be deranged by an improper action of the fluids, caloric, and spiritous principle of such organ or part, without, at first, much injury to solid structure. Such structure resists the causes of disease much longer than is the case with more fluid matter. There is very little injury to solid structure, for a long time, in some cases of mania, epilepsy, spasms, general fever, &c. Those who admire M. Broussais' doctrine of fever, may be startled at what we now say respecting fever; but we think we are right in this case. The physician may often obtain important information from the main mental organ of the patient, or from his friends. The physician's power, however, is often very limited, for all of the unintelligent, or less mental organs of the body are so much under the prudential care of the main propensity of the brain, which is commonly called the will, that, without the important aid of that propensity he can do very little. The doctor, however, when satisfied that the patient will try to help himself, and that he will follow his prescriptions, should consider what remedies the experience of ages may have ascertained to have a salutary effect upon the organ or part diseased; or if an assemblage of organs and parts, and likewise the animal spirit, and other fluids, are deranged in their action, a complication of remedies are often indicated.

The physician, and likewise the patient, if they should both be intelligent persons, have the consolation of knowing, that there is a strong propensity in the organ, or part disordered, including their organic fluids, to right their own injuries, or to help themselves. This propensity is called the *vis medicatrix naturæ* by physicians; and is often sufficient to cure light maladies, without aid, or with very little, unless in very old persons, or in old animals, or in those who have been prematurely worn out by intemperance of some sort. Each patient has a disposition and power to a certain extent, to protect himself from injury; so likewise has each of his organs, even if they should be non-mental ones.

It should never be forgotten that the chylopoietic or digestive viscera, and the respiratory apparatus, support and keep in action the sanguiferous system; and that this last sustains

and nourishes the nervous system, including the brain, and likewise furnishes materials for its organic, or sentient spirit ; and yet, in their functions, each of these systems, like the different parts of a watch, are needed by the other.

The respiratory organ is a highly important one, as well as the others, because it is necessary to the circulation of the vital fluid ; but whether respiration oxygenizes, or decarbonizes the blood, or both, is not fully agreed on by physiologists. It is thought by ourselves, that a plenty of oxygen is needed to make the blood and its halitus, or finer parts, in some way more vivifying ; and likewise to decarbonize them ; and that *atmospheric pressure* is not only wanted, but that it is the first and great mechanical power, which keeps in perpetual configuration every thing that lives upon this globe. Oxygen, caloric, and perhaps light and electricity, and aliment, are the main chemical agents of vitality ; and generation, in some form, the first vital one which perpetually operates.

By way of addition or episode to this paragraph, we wish to say, that those practitioners of medicine, who believe that the contents of the sanguiferous system are often very important in supporting such changes or configurations, as may restore health, in other parts of the body or mind, especially in lingering and in asthenic cases ; and likewise in some of those cases, which are expected soon to be of the last description, are careful to avoid, in the practice of their art, too much depletion ; because in such cases the *vis medicatrix naturæ*, should receive either specific or supporting aid, if any aid is needed. There are exceptions, however, to general rules, and the most discriminating judgment is sometimes needed to make these exceptions.

The effects which the human sentient spirit has upon the solid bodily organs, require from the physician a much greater share of attention in prescribing for those in a highly civilized, or artificial state of society, than is needed in opposite circumstances. Hence the greater difficulty in the business of the physician in some places than in others ; witness that of a large and luxurious city,

20. Such very important parts as have been alluded to in

the last paragraph, should be kept sound as long as may be, or until the animal is worn out, because they sustain—partly for their own benefit, however,—all the other parts or organs of an animal ; and, fortunately for the inferior animals, (and man in his most natural state,) their own experience, aided by the powerful and almost irresistible propensity, on the one hand, of procuring pleasure, nutritious and stimulating matters for food, &c., and, on the other hand, avoiding or obtaining relief from uneasiness and pain, is sufficient, in general, to teach the knowledge needed for such a purpose ; and that, too, however humiliating it may be to the medical profession, without the aid of physicians.(p)

(p) This note is added to prevent tyroes in the medical profession from making false inferences from what is said in the text. In a rich, luxurious, and highly cultivated state of society, an almost innumerable set of diseases, complaints, and evils of various sorts, spring into existence. A suitable number of learned, humane, and skilful medical men can do much positive good, as well as that which is negative, and likewise afford much consolation and much very useful instruction ; and such a society can well afford to have such a luxury. Medical men are too numerous. *Practical knowledge*, as well as erudition, is superlatively needful in the medical profession. The knowledge alluded to cannot easily be had. The most harmless plan to remedy the evil would be, to afford patronage only to the best part of the profession, and thereby compel the remainder to pursue some other employment. For various reasons, this thing has not hitherto been done. Medical fees, and likewise relief from common labour and care, and also a reward for the relinquishment of fashionable amusements, should be such as to induce physicians to bestow much disagreeable attendance on the sick. Responsible attendance is the most instructive : without such a process, it is impossible to have good physicians. Much mischief from human impatience is too often done by thwarting the salutary laws of nature by medicine, especially by some chemical ones ; for these, unless immediately thrown out of the system after their exhibition, are capable of occasioning effects upon vital organization, which may last during a long life. Not so with vegetable substances, whether used as food, or as medicine. Great care and likewise much skill is needed in the use of some very fashionable medicines.

The animal spirit, or vital steam, has a strong hold upon the animal organs ; of course, a patient is not easily killed by ordinary medicines in usual doses. This last is a fortunate circumstance,—considering how liable human beings are to err in the practice of a difficult art,—fortunate for both physicians and patients. Although the existence of the *vis medicatrix natu-*

The double propensity of procuring pleasure, or obtaining relief from pain and uneasiness, is the cause of all animal exertions. This should be remembered as an important fact in moral philosophy. Hence unhappiness, to a certain degree, should not be complained of. The propensity now alluded to pervades almost all the sensitive organs, as well as the compound mental one, in some degree. All of the animal propensities, on the one hand, should be moderately indulged, when they can be without injury to others who have equal rights; and, on the other hand, they should be kept under suitable controul by the governing active property of the brain, or, what in common speech is called the will.

From the view now taken, it is evident that the blessing of sound mind, as well as a healthy body, depends very much upon one's self and friends, and one's education.

21. Education should embrace a suitable discipline of the body as well as the mind. The ambition of parents, especially among the rich, often occasions an injurious excitation of the mental faculties of their offspring, and also a premature developement of the mental organs. Such evils predominate most in large cities. The body can be altered, and sometimes be improved, by physical power, as well as the mind, by education, or by moral causes. When an infant's club-foot is made by the surgeon to grow naturally, or to assume a proper shape, every one will agree that an improvement is made; so, when the human beard is shaved

is of immense benefit to human beings and other animals, yet it often occasions great difficulty in ascertaining when medication does good and when harm. This cause occasions much false testimony respecting the virtues of medicines. Mankind may be annoyed with too much medication, as well as with too much litigation, or with too much false religion, or with too much useless war, or useless commerce, or with too many useless mechanical engines. The practice of surgery has been simplified and greatly improved within a few years; but the same, we fear, cannot be said in favour of the practice of medicine, having reference to an enlarged view of the case. Our book will tend to simplify the latter practice.

off, many think a person improved, or made to look better in the eyes of others. The human head can be made in infancy to grow square or long, according to the fashion which prevails in some places. A woman's foot can be made to be small, as it is done in China; and the body of a lady, can be made to resemble, in shape, that unpleasant insect, the wasp, as is now very unfortunately the unwholesome fashion, even in this highly civilized country. We hope to be excused by the ladies, for we mean them no harm. Eunuchs, oxen, gelding horses, and likewise other geldings, are made such by artificial means; and those means alter the mental spirit as well as the sexual organ, and make it more useful to mankind. Unless such mental spirit was occasioned by bodily organization, why should the mind of an animal, or person be made more manageable by emasculation?

Men, and likewise domestic animals, are said to grow to a larger size in New South Wales, than in England; and we believe, from personal observation made in our own country, that both men and domestic animals grow to a larger size in some parts of the interior of this country, than they do in some places on the sea-coast; and we likewise believe that men have more bodily and mental energy in some places than in others, aside from moral causes. Women are likewise more prolific in some situations than in others.

Fruit, and such like productions, can be improved very much by cultivation and climate. Here we see a sort of education: trees and other vegetables, when young, can, like mankind and other animals, be modified in a variety of ways.

Education should be varied in different countries, and ethical codes ought to be modified according to the different physical condition of the people in different climates. It would be wrong in society to require of an individual the same quantity of labour in a given time, in a very warm climate, as would be proper in a cold or temperate one. The very warm and cold portions of our own country should have customs and laws each adapted to their own condition;

and this is so needful, that the people will have it so. The practice of physic is, and should be, varied in different parts, even of our own country.

The intelligent should teach the less informed the education that is expedient for the society, in which the youth are to act in future life. The learned, however, in some of our public colleges teach, so far as regards the study of nature, too much at a wrong point in the circle of study. Hence erroneous opinions are very prevalent, and very extensively promulgated, *even among men of science*. The book of nature, or rather the God of nature, presents vital, chemical, and mechanical laws for contemplation in a circle; and those laws should be minutely investigated in that order by the learned, or by those who have leisure granted them for such and other useful scientific purposes. The study of the science of vitality, although of the utmost practical importance, is much neglected in some of our colleges. We should be much gratified could we make our book useful in those public institutions; but wrong associations exist at present too strongly rooted to expect such an event, except in their medical departments. We hope no offence will be taken by such free remarks, because none is intended. The college at Lexington, in Kentucky, if our information is correct, is in advance of any other in the United States, in regard to mental philosophy. This remark reminds us of our own fears in relation to the present work: it may be too far in advance, as respects the associations of many readers, to be well received.

The acquisition of knowledge of any kind, even if it be in some respects erroneous, is useful, because it disciplines the mind; but truth is the better commodity. In the business of education more depends on the individual's own will, and on his own genius, or aptness to accomplish his object, than on his teachers. The sentient spirit can be made, by much practice, to act upon the human hands so as to enable them to accomplish an almost infinity of nice mechanical movements to effect mechanical purposes; so, like-

wise, the same spirit operates in an infinity of ways in the acquisition of ideas and knowledge.

It may please some to say, that an immense number of plans for education, and likewise institutions for civil, political, religious, and other moral, or mental purposes, have been patronized by the wisdom, or restlessness of mankind, during the progress of ages; although most of such institutions have been useful to human beings, yet many of them, like houses, cities, and other human monuments, imperfectly built, have had their infancy, acme, decay, alterations, and final end. The brute creation are almost infinitely inferior to mankind, in the formation of such plans and schemes as are now alluded to. The mental organs develop themselves slowly, and are fitted only for appropriate instruction. Of course, about one hundred dollars per annum is enough to educate young boys. Reference is had to board and instruction. Seminaries are better when on elevated ground in the country. Two or three hundred dollars in a year cannot be profitably expended upon boys under the age of discretion, i. e. fourteen years. The opinion recently promulgated, that three hundred dollars can be usefully employed, in one year, in the education of children, is nearly as Utopian as the one, that a Merino buck was worth sixteen hundred dollars.

Those whose business it may be to form new plans, or institutions, for the benefit of their fellow-beings, should study well the mental propensities of such beings. The social propensity, in any given society, which may have been centuries in forming, cannot be altered suddenly, any more than the language of a people can be, without exciting a tempestuous condition of that principle. Hence great and sudden innovations in politics and religion should be avoided, as long as they can be with any propriety, or until such a state occurs as to make different measures absolutely necessary; otherwise war is the result. But it is time to finish this paragraph, otherwise we ourselves are in danger of interesting ourselves too much in the moral affairs of this globe, for one who is supposed to reside on another planet.

22. An acquaintance with chemistry, anatomy, physiology.

and with the writings of Dr. John Brown, Dr. Darwin, Mr. John Hunter, Bichat, and many others, is needed fully to comprehend the preceding outlines of what is known respecting vitality. This kind of erudition is possessed by medical men, and such views as have been taken are very conscientiously believed to be useful to the practical physician; and, as to others, their effects will probably be of little or no moment. To remove prejudice, respecting men and things, errors, false doctrines, wrong associations, false views of religion, or government, or medicine, or free-masonry, or whatever else may injure society, is a Herculean task. Such objects cannot be effected, but in a partial and gradual manner: it must be done, as far as practicable, by the expansion of the human intellect, by the diffusion of information, and by the gradual improvements which may be made in a social state. Mr. Godwin, and other political writers, who contended for the perfectability of human nature, were too sanguine in their expectations; for every kind of frail, vital being must be imperfect in its movements, even when those movements are confined to its own peculiar sphere of action. Natural productions are all imperfect, as viewed by the human mind, as well as those produced by the art of mankind and other inferior animals.

23. The laws of organized life, both animal and vegetable, are better explained by Dr. Darwin—having reference to the first volume of his *Zoonomia*, and to his *Phytologia*, aside from his fundamental error respecting the seat of his spirit of animation, and in his very unfortunate arrangement—than by any single writer. Dr. Darwin supposed the spirit of animation had four different modes of operation, and from this mistaken, or fanciful idea, originated his unfortunate quadruplication of animal, or sensorial faculties, and of diseases. The present writer believes the animal spirit, or halitus operates in as many ways, as their organs, or parts to an animal. Dr. Darwin, like many other writers, often attempted to explain that which must for ever remain incapable of explanation. This fault gave Mr. Thomas Brown great power over the Doctor, when he wrote against the *Zoonomia*. There are too many who seem not to know where inductive science ends,

and that of opinion begins. Some learned physicians say, that they cannot understand what Dr. Darwin has written on vitality. Whether we shall succeed any better, we cannot say: the subject of vitality, in some of its parts, is intricate; and requires that the brain of the reader be properly prepared, or instructed. In illustration, it may be observed, that there are two modes of ascending stairs: one is to pass from one step to the next, until the highest one is attained; the other is to overleap intermediate steps, and thus arrive sooner to the highest one. So in logic, the mind may, on account of its own ease, ascend at once to the truth without the trouble of an intermediate process. We may sometimes be obscure in writing, from the latter cause, especially to mechanical minds; it is impossible to suit all minds, unless their ideas were all associated alike.

We are also much indebted to Mr. John Hunter, Dr. Hartley, and others, and even to the eccentric Dr. John Brown, for new views on the subject of vitality. Dr. Brown is entitled to the very high, and durable honour, of first teaching the important doctrine, that life is a *forced state*. Dr. Rush says, in his lectures on animal life, that it was Dr. Cullen who first originated the idea that life was a forced state; but then he says the Doctor afterwards abandoned that opinion, although he himself did not. Dr. Brown, however, merits the immortal honour of first teaching extensively that doctrine;—a doctrine so important, that without it, vitality cannot be developed. But in many other respects the Doctor's book was a very defective one, and has done much harm as well as good. The Doctor was so unfortunate as not to understand that the excitabilities of the various organs and parts were different, and that these excitabilities have no existence independent of another equally important principle, namely, the spirit of the blood, or that warm, living, organized, all-powerful animal steam, or its elements, which has been called animal spirit. He regarded the blood merely as other unorganized stimulants, acting upon a general and uniform excitability of the whole system. This was a very unfortunate view of the case; for the plastic sanguiferous

system has providently blood enough in store, at all times, in healthy animals to furnish materials for the animal spirit, or the main principle of animal mobility, for a number of days, and, in some animals, even for months, if the animal uses it economically, which can be done, if food is not to be had. The reader is requested not to forget the above position, for we believe it to be an important one, and that the idea first originated in our own brain.

A human being will live without food, either solid, or fluid, for about fourteen days. The blood then loses its faculty, or power of supplying halitus sufficient to vivify the injured organs. There should be a store, or magazine somewhere within an animal for supplying the main vital principle, for an animal cannot be perpetually eating.(*q*)

Dr. Brown considered the excitability of an animal body as a single and indivisible principle, the excitement of which was either above, or below, or at par, or in a perpetually fluctuating state, according to the quantity of stimulants used, &c. The want of the knowledge of the animal spirit, and its numerous modifications, and his error respecting excitability, nearly spoiled his whole system; notwithstanding which his book, and also the physiological works of Dr. Darwin, have been particularly recommended to students of the science of vitality, in our Preface.

(*q*) It may be useful to say, that the adhesion of the vital spirit, or its elements, to its appropriate organs, or parts, whether those parts be animal or vegetable, is not so great, but that such a principle may be instantly dissipated or spoiled, and the death of the animal, or plant be the result. Such an effect may be occasioned by lightning, or by other great causes of concussion, such as falls or blows. A vigorous tree may be thus killed in a moment. An irregular supply of caloric to the human system may likewise occasion an irregular action of a vital steam, commonly called a cold or catarrh. Many feeble old people thus die, without much injury to solid parts.

SECTION II.

1. The terms *sensorial power* and *spirit of animation*, used by the ingenious Dr. Darwin, and adopted by the learned, judicious, and systematic Dr. Good, and assented to by those distinguished medical characters in London—as we have a right to presume—who reviewed his work previous to its publication, are very objectionable, as they imply that the main vital principle originates from the brain.

2. Indeed Dr. Darwin's whole system is founded upon such an opinion. If the animal spirit, or its elements, be supplied by the circulating blood, in a direct manner, to *all* the organs, and then modified so as to be adapted to the wants of each organ, as is maintained in the preceding section of this essay, then it is evident that the term, *sensorial power*, should have a specific meaning, and be applied only to the organic sensitive spirit of the brain.

3. The seat of the main principle of life, instead of being in the brain, as was supposed by Dr. Darwin and his venerable followers, or in the spinal marrow, as supposed by Dr. Le Gallois; or, instead of its having two seats, one in the brain and one in the heart, as maintained by the much lamented Bichat, is, in my apprehension, in the circulating blood. It is believed that this has been in every age the general opinion among the unlettered part of society. Hence the blood has been called the *VITAL FLUID*. It is very easy to perceive how such an opinion should have originated; for most persons occasionally see animals bleed until the vital principle forsakes the body, then they naturally infer that the blood is that principle, or that it is the seat of said principle.

4. Some respect should be paid to so common an opinion by those whose minds, in consequence of much learning, are peculiarly liable to be under the influence of the hallucinations of false science.

5. In confirmation of my opinion, I think proper to furnish the reader with the history of the following case, asking his patience for the length of the story: Several years since, I delivered a woman, of a full grown infant; this was done by the feet, these being the presenting parts. When I had hold of the feet, I had conclusive evidence that the infant was alive, and it was brought into the world without the least difficulty; but it neither cried or breathed, nor made the least effort to do either, and died immediately. The child, however, was deformed in the head; and it was soon afterwards ascertained, by a careful dissection made for that purpose, that not only the brain, but the medulla oblongata, and the whole of the spinal marrow, were wanting. The vertebral canal contained a little aqueous fluid only. The organs and features of the face from, or below the eyebrows were natural; but there was no forehead nor cavity to contain a brain. The posterior part of the head appeared as if it had been compressed upon the posterior part of the bones of the face, and as if they had been afterwards formed into a thick *ossified* mass, of a bloody colour, and without hair. There was no other defect, for the whole child was dissected with a view to my own improvement, and that of some pupils, who were studying anatomy.

6. I must once more beg the reader's patience, until he is put in possession of my conclusions from the facts now given him.

This fœtus lived and grew, so long as the deficiency, occasioned by the loss of the brain and spinal marrow, was supplied by the mother. This child had blood, and the animal spirit, or vivifying steam. This animal spirit *could not have originated from the brain, or spinal marrow*, for these were wanting. My conclusion then was, that the animal spirit originated from the circulating blood; and now is, that such spirit is the halitus of said blood, or that the halitus constitutes the elements of such spirit. Had there been a brain and spinal marrow, these parts would also have been supplied with blood, and animal spirit, or more properly organic spirit.

7. It is not apprehended that it will seriously be contend-

ed, that the function of the brain of a fœtus is directly sustained by the mother without the aid of the fœtus's own organs; or that, because the brain is necessary to life after birth, that therefore the brain must be the seat of that life; for the brain is known to be dependent upon the sanguiferous system, for materials for its own life and growth. The reader will now perceive, why the use of the fashionable terms sensorial power and spirit of animation have been avoided in our first section. There would be no reasonable objection to the use of the latter term or expression, if there was any way to get rid of the impression made by Dr. Darwin's definition of it.

SECTION III.

1. THE food an animal eats is converted into blood. The air breathed, and atmospheric pressure, are necessary to the circulation of the blood. The circulating blood nourishes and repairs the solid organs, and sustains the animal fluids and spirit. Each organ has its peculiar propensity, or nature and function. The animal spirit, or vital steam, and other fluids and matters, are perpetual stimulants, vivifying all the animal organs and parts. Heat and electricity are also constantly operating. For pleasurable purposes, other existing powers are frequently used; these last are not absolutely essential to life. Hence it is evident, that life is a forced state, and that it is sustained by the air breathed, aliment, caloric, &c., received. It is equally evident that the phenomena of life are the results of organization; and, with regard to the inferior or meaner animals, it is apprehended that this position will be generally admitted.

2. The life of an animal organ consists in the union of animal, or, more strictly speaking, organic spirit and coarser fluids and solid organic structure, imparting a specific propensity, or peculiar nature. In some organs or parts, as horn,

hoof, and hair, this propensity resembles, in some respects, that of vegetables. In many of the organs the resemblance is like that of the lower grade of animals, considered as a whole, if we have reference to the excitability, wants and propensities, rather than to their form and locomotive powers. The life of a complicated, or more perfect animal, consists in the union of many such various kinds of organs and parts as are now alluded to, each, like the two sexes, needed and dependent on the other, all operating to produce two effects, namely, to continue their own existence an allotted time, and also to perpetuate the species ad infinitum, or an unknown time.

3. It is a fact that there are solids, semi-solids, fluids, spirit, oxygen, caloric, electricity, if not light and magnetism, in every thing, as well as animals, that is alive. Such principles may, however, be more or less active; or, in other words, may be dormant, torpid, or asleep. It is likewise evident that there is no need of having recourse to a mysterious principle to account for mental phenomena, as noticed on this globe. In favour of the plain common-sense of mankind, it may be mentioned, that there is no evidence that a majority of the immense host of human beings which have existed, have believed in the mental doctrine now alluded to. It has been taught by comparatively a few people.

SECTION IV.

1. If atmospheric pressure upon the veins during inspiration, be the mechanical cause of the very important sanguiferous circulation, as is recently supposed, if not proved, by Dr. Carson and by Dr. Barry, an English physiologist resident in Paris; and if the absorbent system be an assistant to the plastic sanguiferous one, and likewise to the glands and other parts; and if it be demonstrated by M. Bogros of

Paris, that the nerves be tubes rather than spongy matter or of a pith-like structure, which absorbs materials for organic or sentient spirit ; then it would seem that the outlines in detail of the whole nature of animal bodies, and also a multitude of the animal propensities, were, at length, almost entirely developed : and that, too, without supposing galvanism or magnetism to be the main vital principle, having reference in this expression to Dr. Philip. The Doctor's experiments prove, that the organic spirit of the *par vagum*, or nerves, can be made to pass a short distance between the divided extremities of a cut nerve by the agency of galvanism. There is an approximation, likewise, to the truth, respecting many of the mechanical and chemical laws operating in animal bodies, as modified by those that are vital. The mode of the operation of these combined laws is, however, infinite ; of course finite minds can never fully comprehend them.

2. Far be it from us to undervalue the great discovery made by Dr. Barry and by Dr. Carson respecting respiration ; yet it may be useful, even to them, to say, that Asclepiades, who flourished in Rome in the time of Pompey, is said to have thought that atmospheric pressure was one cause of respiration ; and every one knows that to breathe is necessary to the circulation of the blood.

Mr. Hunter has caused to be recorded in the LXVI. vol. of the *Phil. Trans.* (Eng.) the following experiment on a dog, which was made in 1755.—See Dr. Gregory's *Dictionary of Arts and Sciences*.—"A pair of double bellows were provided, which were so constructed that by one action air was thrown into the lungs, and by the other air was sucked out which had been thrown in by the former, without being mixed together ; the muzzle of these bellows was fixed into the trachea of a dog, and by working them he was kept perfectly alive ; while this artificial breathing was going on, the sternum was taken off, so that the heart and lungs were exposed to view ; the heart then continued to act as before, only the frequency of its action was greatly increased. Mr. Hunter then stopped the motion of the bellows, and observ-

ed that the contraction of the heart became gradually weaker and less frequent, till it left off moving altogether ; but by renewing the operation, the motion of the heart also revived, and soon became as strong and frequent as before. This process was repeated on the dog ten times, sometimes stopping for five or ten minutes. Mr. Hunter observed that every time that he left off working the bellows, the heart became extremely turgid with blood, and the blood in the right side became as dark as that in the left, which was not the case when the bellows was working.”—N. B. We have placed the words right and left different from their location in the original, presuming that Dr. Gregory has made a mistake in their location.

Mr. Hunter's experiments on his very unfortunate dog, when taken in connection with other known things, prove that there are three, if not more, powers which differ in kind, which are needed to keep the heart in motion in such a case as that of his dog ; namely, 1. The vital configuration of the animal ; 2. The chemical power of oxygen ; 3. The mechanical power of atmospheric pressure. The last power, at any rate, could be applied at pleasure, in a greater or less degree, by the aid of the bellows ; and the action of the heart was in proportion to the power that was so applied. This is evident from the experiments, or repeated trials, which were made. In this case the voluntary power of the dog was dispensed with, or rendered not necessary to the action of his own heart, through the medium of respiration, by the substitution of the will of another more powerful animal, viz. ; that of the experimenter. We think the above experiment, made so long ago as 1755, will help to support the recent doctrine of Drs. Carson and Barry respecting atmospheric pressure ; but it is probable, that Mr. Hunter never took the same view of his own experiment, that is now taken of it, if any one else ever did. If atmospheric pressure gives the power of working both a single and double bellows, why may it not occasion the action of a double respiratory apparatus, when such apparatus, like the bellows, is under the influence of a voluntary power ? In illustration of this opinion it may be noticed,

that if a suitable aperture is artificially or accidentally made into both cavities of the thorax, respiration ceases; and the circulation of the blood stops, and death is soon the result. So likewise, may a common bellows be spoiled by an artificial, or accidental hole somewhat similar. (*r*)

(*r*) Dr. Bostock, in his physiology, says, those ancient writers, Vesalius and Hooke, reproduced the motion of the heart by inflating the lungs after it ceased to beat. He likewise says that Hales inserted a tube into the crural artery of a horse, and observed that the blood was raised to a greater height in the tube when the animal made a deep inspiration. Dr. B. likewise gives us his testimony in favour of the accuracy of Dr. Barry's experiments, to prove the effects of atmospheric pressure in respiration; he having seen them performed in London. There is another fact to be mentioned, having a bearing upon the question under consideration, viz.; an eminent surgeon, in performing an operation upon the neck, suddenly and neatly cut a vein; the patient died instantly. Now, the probability is, that this vein was transversely cut at the instant of the inspiration of the surgeon's patient, and air consequently sucked into its open mouth; and thus the motion of the heart stopped.

When a portion of the cranium is removed, an alternate elevation and depression of the dura mater of the brain is sometimes visible, corresponding with inspiration and expiration. If atmospheric pressure through the intervention of the double animal bellows, or lungs, does not occasion the phenomena alluded to, one may well inquire, what cause must be assigned? There is much blood in the head to be moved, because much is wanted to supply a plenty of the sentient spirit. In ordinary circumstances, the brain is well protected, by its bony box, from external pressure.

Pains have been taken to show, that atmospheric pressure is one cause of respiration. Without such a fact, and likewise the one, that vital organization occasions a spiritous principle, or fine matter, which acts with such organization, the whole outlines of the animal machine could not be shown.

With a view to show the importance of atmospheric pressure, we add, that Dr. Bostock says, that Dr. Barry contends, that the function of absorption, in animals, depends wholly on mechanical atmospheric pressure, independent of vital action. We contend that mechanical, chemical, and vital actions are necessary to every living function.

As respects vegetables, M. Dutrochet supposes he has proved an organic vital action to exist in all vegetables, by which action finer fluids pass more easily than denser ones, through the *lymphatic tubes* of plants, to the leaves. Would not atmospheric pressure force upwards in a very small tube a fine fluid easier than a coarse one, and thereby displace the latter independent of, or with very little vital action. The friction and weight of a coarse fluid is somewhat greater than that of a fine one. This idea, if true, should not be regarded as ludicrous. Light, caloric, electricity, vital and chemical action, probably aid atmospheric pressure in the ascension of sap in plants.

3. Human beings differ *very greatly in exaltation* from other animals; for the great pleasure mankind derive from sensorial motions, configurations, or thoughts, is such, that they extend into ideal, conjectural, and fanciful regions; thus creating worlds of their own, far beyond the boundaries of that which is present. There is no evidence that the brute creation—for they cannot speak—possess such inventive faculties. Such a resource occasions more and greater enjoyments than the brutes possess; and such enjoyments should not be too much interfered with, in physiological discussions, because almost all agree in their importance. *Experience and history, however, have proved that the danger of doing mischief from such a kind of interference, as that of physiology, is much less than most people imagine.* Hence physicians need not be deterred from the improvement of their art, provided they manage discreetly. A few bigotted persons are, however, liable to be alarmed from free physiological discussions more than they need be.

4. Systems of morals, systems of education, systems of religion, varieties of language, systems of laws, varieties of government, banking and other commercial institutions, medical societies, literary institutions, Bible societies, Sunday School societies, masonic societies, chivalry, Eye Infirmaries, &c., like houses, steam-boats, and other mechanical engines, originate in a measure from human agency, as well as from God, or the Great First Cause.

5. In the spring of 1817 an Eye Infirmary was opened or instituted in New London, (Con.) by the present author, without any adventitious aid. About two or three years afterwards one was established in New-York, upon a large plan; since which time such institutions have become common in the United States, and much good has been done by them; and they may be conducted by one, or by more persons than one, as may be expedient.

We had attended to eye patients before that time; but it occurred to us then, that we might multiply our number of cases of that description, and thereby increase our knowledge, by advertising the public in regard to an Eye Institu-

tion. This was done ; and we succeeded, although not to our wishes, in a pecuniary view of the case. Our success, or exertions, probably hastened, in this country, the establishment of larger and better eye infirmaries, i. e. better for large cities.

6. It may gratify human feelings to remind our readers that the principal circumstances which give mankind their vast power over other animals, and every thing else, are the following, viz.

1. The high, perpendicular, and noble forehead, including their very great variety of capacious mental organs and talents, together with their great susceptibility of improvement by suitable artificial means. 2. The magisterial erect position. 3. The industrious well-formed hands. 4. The ability of inhabiting all climates. 5. The use of fire, cookery, clothing ; written, printed, vocal, musical, and hieroglyphical language. 6. Almost all the mechanic arts. 7. An host of moral or mental institutions, such as those alluded to in the last paragraph. These institutions, although extremely liable to be very imperfectly formed and injudiciously managed, often give one party in society great power over another ; and consequently, the very best good of a whole community requires, that such parties should be kept under suitable subjection by some supreme power. This supreme power, whatever the form of government may be, is in the great mass of the people ; and it consists in public sentiment. But such unwieldy, multiform, or very compounded sensitive power, and one likewise that is very liable to tempestuous delusions, as well as to indolent calms, is often very injudiciously, and sometimes very unjustly used ; and thereby much mischief is occasioned or permitted ; and such must always be the case so long as mankind are imperfect. And we are not one of those who believe in the perfectibility of human nature.

CHAP. IV.

*Outline of Physiology, or of the Science of Life ; with
Notes.*

PART II.

Proemial Remarks.

1. THE medical profession are prone to think more in relation to the sexual apparatus, including that of women, than of the mental one. Although we are fond enough of the former apparatus, yet we do not hold that it ought to rank as high as the latter. We therefore hope to be excused for publishing a book partly on mental philosophy, rather than one that is wholly written on that which is sexual. It is presumed, that the above remark will not be taken in a ludicrous sense by *physicians*. We wish not to give offence to our critics ; because we are aware that those nice and wise characters may be the only ones who will ever read our book.

Some metaphysicians, like Bishop Berkely and Mr. Hume, get bewildered in a labyrinth ; because they cannot comprehend the nature of matter in the abstract, or aside from its perceivable properties ; and, to extricate themselves from such a difficulty, deny its very existence. There is no need of such a plan ; for the question under consideration is of no consequence, so long as the human mind is *forced* into the

belief of such material existence. We have, accordingly, been *plebeian* enough not to enter into such a maze, but shall be content to believe, as the least informed citizens do, respecting the obvious properties of matter, whether living, dead, or spiritous. The most important and perspicuous of those properties, or propensities, is the changeableness of matter, especially when it is alive. *It is as easy to prove mathematically the infinite changeability of matter, as it is, its infinite divisibility.* This is, in mental philosophy, an important fact; for many of those vastly diversified changes may, without doubt, at least in appearance, become intelligent or mental. There is nothing contrary, opposed to, or beyond the comprehension of the meanest capacity in such a position; and, as nothing more is *certainly* known respecting either mind or matter, than what their appearance indicates, cannot a reconciliation in sentiment respecting mind be effected, and a dispute, which may have arisen from badly defined words and misapprehension, be avoided? This peace-making plan is one of our grand objects in writing our book; but when it was unknown what the whole of the vital powers were, especially in human beings, including the material sentient spirit or halitus, or its elements, there might have been some excuse, or even expediency, in the opinion of many—having reference to public prejudice—in saying, as Dr. Good, Mr. John Abernethy, and many other good men have done, that the phenomena of mind in man was occasioned by an unknown principle, designated by the common name of soul. But if we have succeeded in pointing out all the powers which occasion vitality, such an excuse as we allude to no longer exists, at least among philosophers.

2. Life, including the sentient spirit, must be admitted, unless we have been greatly deceived, and for more than thirty years, and in company with Epicurus, Lucretius, and many other ancient and modern philosophers, such as Drs. Brown, Darwin, Priestly, Rush, Bichat, Magendie, Lawrence, and Emmet, to be nothing more, *so far as can be proved philosophically*, than a form, or assemblage of forms, of changeable matter, some of which we believe to be spiritous. Hence

we have claimed a right to be regarded as a spiritualist, in contradistinction to some of the eminent characters above named. Such is vitality on this globe. Our conduct in this case is governed by the principle, that a correct view of things is much better than a state of doubt, and contributes to the well-being of the most intelligent part of mankind. A public writer, and likewise every one else, should show some respect or indulgence to human error and imperfection, as evidence of his candour, and likewise of his benevolence. Such writer should not be too much disturbed, if he be sometimes treated with cant words and cant phrases, originating from mental indolence. Evil, however, often originates from such a source ; but then, such evil should be submitted to with proper patience, because it cannot always be avoided.

SECTION I.

On the social principle of Animation or Vitality, embracing more particularly that of mankind.

1. A part of this subject has been considered in the first part of the work, but there are other ideas to be suggested. We may be guilty of the fault of a repetition of ideas, if such conduct should be a fault ; but readers will differ in opinion on questions of expediency. Our object is to make a durable and a perfectly intelligible impression upon the brains of attentive tyroes in the study of vitality.

2. The animal and sentient spirit, or main vital principle of one animal—besides its other domestic powers—has a twofold operation upon that of other animals. One of these is an attractive, the other is a repulsive power. The former power is the cause of the social, congregating, herding or friendly propensity ; the latter occasions that which is un-social, unherding, or hostile. The former propensity operates much more frequently than the latter, probably because the

greatest good requires this to be so ; besides, these powers are not at all times active. The double propensity of the sentient spirit now alluded to, occasions various effects upon the almost infinity of animals, and also upon the same animal, at different times and at different periods of its existence. These effects among mankind are the best known, and are also the most interesting ; hence they need the most attention. Such effects are produced by the agency or help of the animal solid organs and parts. There are two worlds on this planet : one that is spiritual, and one that is a world of solid or semi-solid vital organs and parts. The organic world occasions the spiritual one, and this last operates perpetually upon the other. This reaction constitutes vitality.

The spiritual part of vitality is not in vigorous operation so perpetually, as is the case with its organic part ; for the sentient spirit of the former part, at least in mankind, is asleep or torpid a large portion of the time. Rest is needed for the invigoration of so important and active a part of vitality, as that of its sentient spirit. The two-fold social principle may be varied by education or management, in a great variety of ways.

3. In illustration of our subject, it may be mentioned, that vegetable halitus or spirit has also an attractive and repulsive tendency in some small degree. Ingrafting trees and the hurtful influence of the barberry bush upon growing wheat, and other facts, prove such a position. The garden squash is said to injure the cucumber, by growing in the same vicinity ; but plants have not, like animals, those very highly perceivable pleasurable sensations, and very active, and likewise very obvious feeding and providing qualities, which result from sensation, volition, and locomotion. This vegetable defect often occasions the growing position of one plant to interfere too much with that of another. This fact is often a source of sorrow to farmers ; for it occasions great labour to extirpate or remove, to a wholesome growing distance, plants of the most worthless character from those which are highly valuable. Extirpation, the labour being less, is the most frequent resource in such a case.

Plants, like mankind, may be much improved by art. Vegetable spirit has sometimes, either a pleasant, or a poisonous effect upon animals. Vegetable and animal vitality are known to be alike in many respects, and each is useful to the other.

4. The attractive or sympathetic propensity operating among animals is, in general, the most efficient among those whose organization, education, religion, moral and political habits are most alike. Hence, in part, the common proverb, "birds of a like feather flock together." Hence also those physicians, lawyers, and others, whose minds are very highly cultivated, are seldom very popular among the common citizens. Hence, also, larger fees are needed to support such characters than otherwise would be wanted. But any individual mind feels a lively interest in all other minds. Hence mind often parts with mind with sorrowful reluctance. Such is not the case respecting vegetable vitality, nor with matter that is dead. To the doctrine of sympathy taught in this paragraph, the opposition of sex may be regarded partly as an exception; but it should be considered, that the animal spirit and other parts operate in a different mode in performing sexual movements, and that, too, at times powerfully.

5. Multiplicity and proximity of minds increase sympathetic movements in a manifold proportion; this, at any rate, is the case among mankind. Sexual movements may also be increased by similar causes; but such means, as are now alluded to, are not tolerated in society with regard to sexual movements. It is not, however, so with regard to mental excitation: each individual experiences the intellectual excitation of the sentient spirit, which is only a modification of the animal spirit—(which spirit is what has been rendered from the Hebrew word into English, by the well known word, soul,)—in a high and pleasant degree, whenever he mixes in any large concourse of people. Such is the case, when he is in a large and highly devotional and highly exciting religious assembly; or when he is in a bloody military battle; or when he is witnessing a Juggernaut exhibition. Similar effects were formerly produced by witness-

ing the Olympic games. Like effects also result from a military parade, from a warlike dance, from a savage or other criminal execution, from an interesting funeral, from a political celebration, or political insurrection, or mob of any kind ; from a theatre or dancing assembly.

6. Oratory occasions, in a large audience, a vast sum total of the movements of the sentient spirit, and also much enjoyment. Music also is a powerful cause of exciting animal pleasurable emotions, or the animal spirit. Novels, poetry, and other reading, occasion similar results. Many persons abuse the luxury of reading ; such persons will say they are gaining knowledge ; but there is false, as well as useful knowledge or erudition. The hum, noise, and bustle of cities likewise cause agreeable sensations. Rocking, swinging, and curved lines and waving motions, by the gentle agitations of the animal spirit, in connection with organic motions, produce much enjoyment ; so likewise do the various modifications of light and colour. Close and visionary thinking, animated conversation, and gaming of every kind, excite, and, in an agreeable manner, too, the sensorial powers. Certain substances taken into the stomach, as wine, alcohol, and opium, likewise cause similar, although more detrimental, movements to those which are more purely mental. The exercise of the passions, especially the amorous one, occasions much sensorial and sexual pleasure. It can hardly be needful to say, or repeat, that this pleasure is occasioned by the combined operation of organic spirit and other fluids and solid organic structure. The abuse of the amorous propensity is a fruitful cause of nervous diseases, consumptions, dyspepsia, pimpled face, lumbagoes, and injuries of the brain, or more commonly the organs of sense and the genital organs.

7. The mental excitement and probable exhaustion of the animal or organic spirit, occasioned by some of the above sources of enjoyment, which have been alluded to, may be abused, as viewed medically, or carried so far as to occasion an actual falling down of some individuals, and a comatose, but unpainful, if not pleasurable state. Such a state is often

noticed in Methodist camp-meetings, and sometimes in other devotional assemblies.^(s) It may be produced by an unreasonable dalliance between the sexes. It has been noticed also in military battles, and in dancing assemblies; and is often, as is well known, caused by rotatory motions, by skating, and other violent commotions of the animal body, by wine, and by ardent spirits. Death has been known to result from such sources. In general, this comatose state is gradually removed by an accumulation, at least as respects its power, of the animal spirit. This spirit probably becomes, in such cases, more equally diffused through the system, during the gradual recovery of the person. A curious history of a case of coma is now going the round of our medical Journals from Vienna. In this case a military quarter-master, from a sudden mental cause, became completely comatose, and he remained so fifteen months. His intellectual, sensitive, and locomotive nervous matter had not the power to absorb, or receive a sufficient quantity of the sensitive

(s) A curious religious sect, or, what most people would call a party of fanatics, appeared in this country about forty years since, well known by the name of Shaking Quakers. Their leader and founder was Ann Lee, niece of General Lee, of the American revolutionary army. She and some of her deluded or enchanted followers came from England. She was called by them Mother Ann, and received a revelation from heaven, as was pretended.

This sect spent whole nights in their fanciful, enchanting, or pleasurable gesticulations; and both sexes, being partly stripped, fall to dancing in extravagant postures, and frequently whirl themselves round on one leg with inconceivable rapidity, till they fall comatose on the floor. A spectator asserts "that the fantastical contortions of body in which their pretended religious exercises consist, bear the *semblance* of a supernatural impulse, and that no imagination can form an adequate idea of the extravagant conduct of these infatuated people." This eye-witness should have used milder or more candid language, and should have said these highly and piously hallucinated people. This party hold their property in common, and live in families, without matrimony or sexual intercourse; and are remarkable for their industry and ingenuity, both in agriculture and in the mechanic arts. Of course, they are useful citizens, aside from their foolish violation of one of the first laws of nature, or God, viz. that of matrimony; for even animals find it useful to marry. See Dr. Thatcher's Military Journal.

spirit from the blood, to render that sort of nervous matter highly active, to which we allude. He appeared *to have no mind or sensation*. The animal spirit and organization was, however, sufficient to prevent self-putrefaction, and the means of living were supplied by other minds. He finally regained his mind. Such a case as that of the quarter-master renders it highly probable, on the one hand, that the whole blood is not the sentient principle; and, on the other hand, that there is, in health, a halitus or fine principle selected, or absorbed, from the blood by the nervous apparatus, for so important a purpose as that of sensation and perception.

8. It may be useful to say, that political and popular delusion of every kind, occasioned by the too great agitation of the social propensity, often operates too strongly to be controlled by cool philosophy or right reason; and those individuals, who may be imprudent or independent enough to attempt it, however correct their motives, are often sacrificed to the bigotted fury of the multitude. Besides, other great and monstrous effects often result from such a delusion, in every social state. Such was the case in New-England, during the prevalence of the Salem witchcraft mania; and likewise in New-York, upon the injudicious suspicion respecting the Negro Plot, in 1741. Such also has always been the case at frequent periods in every part of the world. Great delusions are, in general, the most tempestuous during great political and religious struggles: such was recently the case in France; and too many restless spirits at all times have, or think they have, an interest in disturbing the calm social propensity of society: at any rate, they take a pleasure in so doing, and it can often be easily accomplished. Upon the whole, the social propensity is of so fluctuating and yielding a nature, and so liable to delusion, that calms and occasional storms, as in the natural world, must always be expected, in spite of the efforts of philosophy, calm religion, or cool reason. It is, however, the duty of those in power, and every one else, to moderate and remedy, so far as may be prudently practicable, the evils arising from such causes as have been contemplated. There is no evidence that the

social propensity, among the brute creation, is liable to so great a defect as that of great delusion. In society, many good, and some bad things may be done under the influence of popular delusion ; such things, however, cannot reasonably be expected to be done in the best manner. Hence true philosophy does not expect too much wisdom in the common management of human affairs.

9. The reader is requested to bear in mind perpetually, that the important, public, social, or friendly propensity, among mankind, is dependent on the sentient spirit that belongs to a multitude of rational beings, which sentient spirit is now known or taught to be occasioned by an immensity of human organs and vital parts. The hostile propensity is the reverse of the social one in its action. Thus, each one has perpetually in view the true connection that exists between what has been called the natural and the moral world, so far as human creatures are concerned in this life. This connection has not hitherto been perceived by the metaphysicians. There is a natural and a moral world peculiar to every race of sentient animals, or a spiritual and organic part, and a frequent hostile collision takes place, between the spiritual part of the immense host of the different races of animals which exist on this planet ; or, to speak in more familiar language, there is a perpetual and deadly war between the different races of animals existing here, and their very existence requires that it should be so.

SECTION II.

It is now proposed to treat of certain artificial states or conditions of the human brain. The practical physician should be well acquainted with every unnatural or artificial condition of any organ or part belonging to a human being, as well as with their most natural condition, otherwise he can never know how to act ; or whether moral means or medi-

cation may be wanted, or neither. There is reason to fear that the knowledge needed for the moral treatment of human creatures has been too much neglected by physicians.

1. A great many individuals, in every civilized society, may be found, whose brains have been operated upon by moral and literary causes, or other means, among which means or causes, is the very perplexing or painful one of doubtfulness, so as to occasion a peculiar, unnatural, artificial, or semi-artificial condition of said brains or minds. An exact, precise, and well-defined name, for such a state as is now alluded to, is a desideratum in common speech. Insanity, even if qualified by the word mild or partial, is much too harsh a name for such a state. Insanity is, however, sometimes occasioned by similar causes. The word hallucination has sometimes been used to designate such a state of the brain, as the one now alluded to; and, as a general term, it may be as good as any one which we possess, especially if sometimes qualified by such words as semi, partial, or mild.

Such a condition as that of the hallucination of the brain or mind, is not, at all times, easily perceptible to every beholder; but its different modifications *are known to exist*, and are distinguished, in common language, by such words and phrases as the following; namely, self-delusion, or self-enthusiasm; being bigotted; being visionary; being under the too great influence of the imagination, or fancifulness; want of sound judgment; being awakened in a religious sense of that word, or having a change as respects devotional feelings; sentimental love; too nice, or an artificial sense of honour, often showing itself among military officers; being too sanguine or unreasonably zealous in any laudable or other pursuit. Hallucinated, or semi-hallucinated characters, are often very interesting, and frequently make bad men better, and often acquire great influence, at least for a time, in society. Cool sound heads are seldom very popular, although in the long run very useful; but an excited brain, like that of Columbus, when properly directed, may be more beneficial than the others alluded to. An impassioned brain may, however, be different from an hallucinated one; because the former

may be sometimes correct in its judgments. Besides a brain may be both impassioned and hallucinated, and vice versa.

Such an artificial hallucination of mind operates in almost an infinity of ways. We have no evidence, or next to none, that hallucination occurs among the brute creation; but in human beings, owing to their capacious ingenuity, it so often occurs, as to make it one of the characteristics of the race. It is most frequently occasioned by religious devotion, or religious causes; and it often does good in such cases, by softening the asperities of human nature, as well as in other ways; and in many such cases it may not be expedient for an individual to resist such a change, at its threshold or commencement, although he has a natural inclination to do so.

We think men may be good, at least comparatively so, without being hallucinated. A clerical convention has recently decided, by an unanimous vote, "That revivals of true religion are the work of God's spirit," and that "*human instrumentality* is needed to occasion such a work." Now, this is probably accomplished in the subsequent manner: The human sentient spirit is God's spirit in one sense, because every thing, without doubt, belongs to him. Now, this sentient human spirit is undoubtedly operated upon by human agency, so as to occasion those revivals alluded to. In illustration of the above sentiment, the subsequent remarks are added. The works of the whole animal race, and the productions of nature or God, are known to be very different. The former works are, however, occasioned by God, through the agency of his creatures. Hence the Almighty may be said to give rise remotely to governments, languages, cities, as well as to hallucination, or other unusual affections of the human brain. It is very probable that those learned, respectable, and pious men who composed that Convention, were unacquainted with the nature of the human sentient spirit, as now taught by true physiology. An honest difference of opinion ought not to be a cause of offence; for Christian ministers differ in opinion, as well as others, respecting regeneration, or what philosophers call hallucination.

2. Hallucinated characters, when they over-zealously profess to be much better, or even much wiser, than other people, often excite a violent opposition, and even hatred, among those in different circumstances. This difficulty arises from the pride of opinion, and other propensities in human nature. Such causes often greatly disturb the peace of large communities, and likewise the harmony of private families, and should be constantly had in consideration by those who officiate in the very difficult business of managing the minds, passions, and propensities of mankind, with a view to human pleasure, virtue, and happiness. Oratory, or public speaking, is a powerful remedy for the prevention of vice—to use a medical phrase ; but, like powerful remedies in the hands of quacks, it is capable of doing great mischief as well as good, unless discreetly and judiciously used. We do not advance the above as a novel doctrine, for every one knows that the management of religion is attended with evils, as well as with benefits ; and, by the by, it is highly probable that the very best general good of society requires that it should be so ; otherwise a very respectable profession might acquire too great an influence, for the benefit of the whole community. Party, in some degree, is needed in every society, and leaders are likewise wanted. The profession to which we allude, have always been, in this country, the decided friends of correct medical science. This is much to their credit, at least among physicians. Of course, the two professions ought to be in harmony, even if they should be so unfortunate as to differ in some points respecting mental philosophy.

Such a difference does little harm among the common people. An exact philosopher should never forget, that his nice speculations are not so well adapted to the capacity of the commonalty, as opinions of a coarser nature. They have not leisure to attend to nice points in literature. Such characters are more usefully employed in the common concerns of life. Hence many opinions, in religious and in moral affairs, if they be not strictly true in a philosophical view of the case, do more good in common society than correct

philosophy would do. The whole history of mankind shows such to be the case. Every true philosopher, whether physician or not, must venerate the clerical character as given by Dr. Goldsmith, in his *Deserted Village*, and which is here introduced as an illustration.

THE VILLAGE PREACHER.

* * * * *

The village preacher's modest mansion rose.
 A man he was, to all the country dear,
 And passing rich with forty pounds a year ;
 Remote from towns he ran his godly race,
 Nor e'er had chang'd, nor wish'd to change his place :
 Unskilful he to fawn, or seek for power,
 By doctrines fashion'd to the varying hour ;
 Far other aims his heart had learn'd to prize,
 More bent to raise the wretched than to rise,
 His house was known to all the vagrant train,
 He chid their wand'rings, but relieved their pain ;
 The long-remember'd beggar was his guest,
 Whose beard descending swept his aged breast ;
 The ruin'd spendthrift, now no longer proud,
 Claim'd kindred there, and had his claims allow'd :
 The broken soldier, kindly bade to stay,
 Sat by the fire, and talk'd the night away ;
 Wept o'er his wounds, or, tales of sorrow done,
 Shoulder'd his crutch, and show'd how fields were won.

PLEAS'D with his guests, the good man learnt to glow,
 And quite forgot their vices in their woe ;
 Careless their merits or their faults to scan,
 His pity gave ere charity began.

THUS to relieve the wretched was his pride,
 And ev'n his failings lean'd to Virtue's side ;
 But in his duty prompt at ev'ry call,
 He watch'd and wept, he pray'd, and felt for all :
 And as a bird each fond endearment tries,
 To tempt its new-fledg'd offspring to the skies ;
 He try'd each art, reprov'd each dull delay,
 Allur'd to brighter worlds, and led the way.

BESIDE the bed where parting life was laid,
 And sorrow, guilt, and pain, by turns dismay'd,

The reverend champion stood. At his controul,
Despair and anguish fled the struggling soul ;
Comfort came down the trembling wretch to raise,
And his last falt'ring accents whisper'd praise.

At church, with meek and unaffected grace,
His looks adorn'd the venerable place ;
Truth from his lips prevail'd with double sway,
And fools, who came to scoff, remained to pray.
The service past, around the pious man,
With ready zeal each honest rustic ran ;
Ev'n children follow'd with endearing wile,
And pluck'd his gown, to share the good man's smile.
His ready smile a parent's warmth exprest,
Their welfare pleas'd him, and their cares distrest ;
To them his heart, his love, his griefs were given,
But all his serious thoughts had rest in heav'n :
As some tall cliff that lifts its awful form,
Swells from the vale, and midway leaves the storm,
Tho' round its breast the rolling clouds are spread,
Eternal sunshine settles on its head.

3. Political causes sometimes occasion hallucination, and, in such cases, it may be useful to a party or country to effect a particular object. Commercial operations often occasion it. Philosophers, politicians, physicians, judges of courts, and cool scientific men, should not, however, be too much under such influence. But the history of many such characters, and their writings, in every age, show that they, as well as others, are liable to be thus affected ; at least so far as respects some things, and during certain parts of their lives. Hallucination in science, as well as in religion, often comes on suddenly. In illustration of this opinion it may be mentioned that the troubled mind of the late amiable Dr. Rush, became instantly hallucinated, while he was reading an old manuscript of Dr. Mitchell's on the yellow fever. See Dr. Rush's work on Yellow Fever. The influence of an hallucinated mind, in the exact sciences, sometimes occasions much mischief, however good the intentions may be.

It may promote benevolence to say, that hallucinated persons should not, *in general*, be treated by their friends with ridicule or severity, as has been too often the case, but with

great delicacy, discretion, skill, and humanity ; for such characters have often more decision than other people. The very celebrated John Foster, when he wrote his powerful *Essay on Decision of Character*, was not probably aware of the frequent operation of hallucination in the formation of such a character. His own mind was not in a proper condition to make such a discovery. Ridicule, however, sometimes prevents hallucination. Harsh remedies, or even mild or powerful arguments, seldom cure ; time and self-reflection is a much better remedy. By the by, many such characters often gain a decided pecuniary advantage over others. They, of course, cannot desire to be cured of so profitable an infirmity, or very slight defect, or, what many respectable persons honestly believe to be an improved or better condition ; especially as such a condition is usually an agreeable one. The religiously hallucinated part of society are prone to think, that they are honestly entitled to a larger share of the common stock, as respects both property and fame, than others. This cause often occasions an excitement or reaction in a community. They demand more than others.

4. Another reason for treating hallucinated persons gently, grows out of the circumstance, that those persons who make discoveries, and likewise those who are employed in making nice and intricate investigations, are sometimes thought by others to be in such a condition when they are not so. We may be a little selfish in making the last remark, because it is very probable that we, as an author, may be thought by many less informed people to be, ourselves, hallucinated. We have, however, this evidence, that such is not the case : no sudden alteration in our own mind upon the subject upon which we write, has occurred. Hallucination generally occurs suddenly, or within a few months. The painful state of doubt, as well as sympathy, often gives occasion to it. Our mind has not been in such troubled circumstances. These things are mentioned in anticipation of cavilling readers.

By the by, it is very probable, that there may be a few hallucinated persons, even in our own profession,—and who

may be very respectable as members of society,—who may slightly dislike some parts of the present book. It is, however, contended that there is a just right for the publication of a book in vindication of the most numerous class.

5. The following well written account of a very active and odd species of hallucination, called the *Jirks*, is republished here, because we think that it cannot fail to be highly instructive to our medical readers.

(FROM THE GOSPEL LUMINARY.)

Account of the Strange Exercises called the Jirks.

The *Jirks* have been commented upon by several writers, whom I have examined, but none of them are satisfactory to me. Neither do I think the case has been satisfactorily explained to the public. Nor am I, from my small acquaintance and experience with the subject, capable of doing it justice; however, I will state a few simple facts which I saw and heard; and I am sure, I was candid and deliberate in my judgment, and correct in my notes which were taken at the time.

In my first visit to Ohio, and Kentucky, in 1825, I saw some specimens of what was called the *Jirks*, and heard many accounts from different persons, of what they had seen, in the time of the great revival in the west, of those uncommon exercises; and also conversed with several persons who had experienced them, but my inquiry was not satisfactory. It merely served to envelope the subject in greater mystery, and excited in me a strong desire to witness and examine a case of the kind for myself. During my second visit, in November, 1826, I was favoured with an opportunity of witnessing those singular exercises, of exercising my judgment, and of testing my spirit of discernment. I called at a little village which I had visited the year before. There was, at this time, a gracious revival of religion progressing under the labours of Elder —, converts were multiplied, meetings were held day and night; and indeed little else was done, for several days, in the place.

My appointment had been given out a month or more, before my arrival. When I reached the hotel where I was to preach in the evening, I saw the multitude flocking together, with anxiety beaming in their countenances. My aged and venerable host tore me from my horse, exclaiming, "God in his mighty power is among us;" while his lady, standing in the door, exclaimed with uplifted hands and eyes, "glory to God in the highest." How changed was my condition; but one hour before I was crossing the lonely plain, and penetrating the deep wilderness, with a soul wrapped in solitude; now I was ushered into a comfortable parlour, and thronged and pressed with zealous believers in the Son of God. When it was time to commence meeting, all parts of the house upon the lower floors were filled to overflowing, together with about eight preachers beside myself. My discourse was long, but the hearers sat with great patience, sometimes expressing their approbation by their amens, and, at others, by their smiles and tears.

Soon after the meeting commenced, I saw several young ladies, well dressed, and of good appearance, who began to be uncommonly exercised; which exercises they endeavoured to suppress. It appeared to mortify and embarrass them very much, when they had 'the power,' as it was called. During the sermon, their shoulders would be seized with violent and sudden convulsions, the neck, also, would be affected with spasms, which threw back the head in a frightful manner. It would sometimes seize one hand or arm, but the neck or shoulders were the first subjects of its operations. When I had concluded my sermon, the congregation commenced an animating song of praise, which greatly increased those extraordinary exercises. The whole system of several young ladies became so convulsed, that they were incapable of sitting upon their seats. The songs of praise were now heard from all parts of the assembly. I shall here leave several cases of a similar kind, and confine myself to one individual case, which is a fair sample of several others.

The young lady of which I shall now speak, was of fair countenance, good health, excellent moral character, and of

tolerable understanding. She appeared to be about twenty years of age, and had lately become a subject of hopeful conversion. She was among the first who was attacked with these singular exercises. At first, as I have already observed, she had only occasional spasms during the sermon; but during the time of singing and prayer, for the space of half an hour, her whole frame was in the most violent agitation and distress. While in this state of apparent distress, every heart appeared to be moved with fear or pity; for it seemed that she could not live, without finding relief, for one hour. But after thirty or forty minutes her exercise became organized, and the agony or convulsion settled into one regular motion. She now stood erect upon her feet, a female holding each hand, standing at a proper distance on either side, both facing her. Her motion was now that of bowing down, forward and backward, in a quiet succession, which baffled all skill to imitate. Her head came regularly within about four inches of the floor before and behind. At every motion her long flowing hair would lash the floor, both before and behind, with as much violence as I could have struck with my hands. This exercise lasted about one hour, towards the close of which it became a little more mild, and her countenance assumed an agreeable appearance. She appeared happy, and attempted to speak, but could not be understood. The velocity of this motion was almost incredible. Her hair struck the floor in that regular exercise for the space of about an hour, as often as seventy-five times a minute. This statement, no doubt, will appear greatly exaggerated to persons unacquainted with such exercises. How her body could endure the fatigue, her blood pursue its regular motion, and her brains retain the proper order, are questions too mighty for me to answer.

When she had become calm, though she could not yet speak, she was taken into another room. I suppose she was absent about half an hour; while I was engaged in observing the exercises of others, she returned, and took her seat near me, and commenced singing. She appeared quite cheerful and happy, and her countenance was so much altered that I did not know her. In the course of conversation, I enquired

for the person who had been so much exercised, and had felt the room; when, to my great astonishment, I was informed that she was the person herself. Her countenance was serene and natural, only a little more pale than usual. I then conversed with her freely, with relation to her views, feelings, and exercises. She observed that she did not feel the least inconvenience in consequence of her exercise—that she had them frequently—that she never felt sore the next day, nor in any case her natural strength debilitated.

I then put to her the following questions, and received the following answers: *Ques.* Are those exercises desirable? *Ans.* They are not, nothing is more degrading to my natural feelings. *Ques.* What produces these operations; do you feel them in private devotion? *Ans.* They are produced by *preaching, praying, and singing, or any thing which produces an unusual exercise in religion, whether in public or private; and when I am the most spiritual I am the most subject to them, though I have never had them to the same degree in private.* *Ques.* Then you think they greatly depend on a *good, lively meeting?* *Ans.* They do; and so do all religious excitements.

The spirit of these exercises was all through the neighbourhood, and it was considered impious to question their divinity. Some young females had something of them for two or three weeks together. Some females, who were quite small, not more than eight or ten years of age, where their older sisters had them, and whose parents were also believers in them, had something of the *Jirks*, (as I was informed) for a month together. One young lady, who was in the business of school-teaching, informed me, that when she conversed or prayed with her scholars, read her Bible, or engaged in secret devotion, she never failed to be affected with spasms in the neck and shoulders, all the preceding summer; and that, in consequence of this, she neglected those duties for weeks together.

Our meeting, from the time my discourse ended, which was about 9 o'clock in the evening, was a confused place. All the assembly were in motion, some praying, some singing.

some weeping, some rejoicing, and others engaged in private conversation. Usually a male, or female would arise and give a pathetic exhortation. Wherever we turned our eyes we could see the effect of spasms. About two o'clock in the morning I retired for repose, and left many to continue the meeting. Soon after retiring to rest, in consequence of long fatigue, I soon sunk into sleep.

Those people have but little order as a Church. I believe they are a very pious people. The great separating day, which is at hand, will blow away the chaff, and gather all the true wheat into the garner of God.

Yours respectfully,

J. BADGER.

Boston, Mass. July 10th. 1828.

7. Devotional pleasure, both private and public, can be had at much less expense of thought and treasure, than that of inductive philosophy : hence, the former pleasure is better calculated for the edification, or use of the common people, including women and children, than the latter. A great mistake was committed respecting this important truth in France, during the period of its bloody revolution, which occasioned an immensity of mischief. A suitable part of the spare funds and labour of society should, however, be applied to the cultivation of philosophy, as well as religion. Both, like the impassioned and the unimpassioned human thinking apparatus, are useful in society to counteract each other when in error, and for other purposes. There is, just at this time, on the one hand, too much intemperate zeal in warm religion, and, on the other hand, not enough in philosophy.

It is believed, that the United States' government has power granted it by the people, to patronize inductive philosophy, although such power has been perhaps wisely withheld in relation to every kind of religion. Religion can support itself, without any other aid than that of protection, from such a go-

vernment as ours. Such may not be the case in relation to more difficult philosophy.

8. There is a derangement of the very complex thinking apparatus, unfortunately produced in a few persons, while they are on board a steam-boat, if not in other vessels or ships. This delusion, or mild insanity, occasions such persons to leap or to fall overboard. In illustration of such a curious fact, the reader is reminded, that the late illustrious President Adams, and a few other persons, have each lost one relative at least, in such a manner. Individuals should be educated, so as to resist this dangerous *artificial or morbid propensity* at the threshold, or before it is completely formed. Tranquil solitude, or rest of the mental or sentient organs, keeping the head cool, &c. may be resorted to, when expedient. It may be mentioned in illustration, that fortunately the ancient, or long known sea-sickness, is attended with much less danger than the new, or too much neglected complaint now alluded to.

9. Too zealous, and too often repeated devotional exercises occasion a durable solemn countenance and gait in human beings. Unless the soul acted strongly and repeatedly in one way, upon the mental apparatus, such permanent effects would not be produced. Such causes often occasion nervous complaints, including insanity. Discreet physicians may sometimes do good, in such delicate and sympathetic cases, among their confiding friends, by contrived influence, and in other ways. Clergymen and others should know, that such intemperance, as is now alluded to, shorten human life, notwithstanding the pleasure it occasions. Temperate societies might do good in such cases, as well as in regard to ardent spirit.

Physicians, lawyers, merchants, soldiers, sailors, and other characters, likewise acquire, from habit, through the continued action of the sentient spirit, an appearance, each peculiar to the class to which he belongs; and different self management and medical treatment are needed by each. The expediency of using such powerful means as occasion the Jirks, depends on the decision of others, not on that of the mere physiologist. On

questions of expediency people differ much in opinion ; but the practical physician ought to be well acquainted with the Jirks, and likewise with every other kind of hallucination, in order to know how to treat such cases when called on. The Jirks occasion pleasure, like opium and wine : but physicians know, if other people do not, that too much pleasure, even if it be mental, often injures the health. We have no doubt but that egregious blunders are often committed, even by physicians of high reputation, for want of such knowledge. Indeed, we now recollect one error of the kind, which was committed by one of the very first medical characters in this country ; for, very unfortunately for his patient, the Doctor did not understand the nature of the Jirks.

10. We fear that we are in danger of becoming too serious to suit a part of our readers ; we therefore will vary our subject. No respect should be paid to a general rule respecting hallucination in such a case as that of W—— S—— of Philadelphia. Said S—— has very foolishly and virtually dubbed himself high chief among quacks, in an offensive publication against the Philadelphia Medical Society, and in opposition to an immense host of other honest men ; he therefore should not be treated by cool reason, or by any other mild means, but by poetical satire or ridicule, if he does not require a strait jacket.

Not that quacks, and S——, as self-elected high chief and leader among the rest of that contemptible host, may not sometimes, on the one hand, by mere chance do good ; but then, on the other hand, they are known to do, from their contemptible ignorance, gross dishonesty, and offensive effrontery, an immensity of mischief in every age and country ; and such mischief, including a very hurtful excitement perpetually kept up in society by them, much more than counterbalance any good which such ignorant men can do. The understanding of rational people is more highly insulted or annoyed by ostentatious lies perpetually told in quack advertisements, than by any other species of falsehood. The printers and paper makers, however, gain an advantage thereby ; and habit and custom lessen the evil ; and it must

be submitted to, because some people prefer to deal in very lucrative falsehood, rather than in more honest truth.

Some physicians think medicine is a rational science, and they are willing, for a suitable reward, to teach others, so far as they are susceptible of being taught, how to manage in sickness and in health; but, very unfortunately for many people, even in a highly artificial state of society, this needful knowledge cannot be easily communicated, for it requires a long and correct discipline of the brain. Hence mankind judge very badly respecting both physic and physicians. There is another class of physicians who admit the above position to be true; but then, they say, at least by their conduct, that mankind are ignorant; and that consequently they will patronize quacks and quack management, so far as their own interest and pleasure are concerned. The quack is almost too ignorant to know whether physic is rational or not; but then, he knows that many of his fellow-creatures are cowards when sick, and that they, in such highly distressing circumstances, are easily duped. Of course, he exercises all his ingenuity to sell his medicines, and likewise his pretended skill, to them. Each of these classes of persons who deal in medicine, have, however, their reward: the first class are the most esteemed; the second, less so; and the last are despised by all rational people. There can be no harmony between the first and the last class; and yet, the former characters may, under peculiar circumstances, use the medicines of the latter.

It is in vain, and even ridiculous, for W—— S—— to appeal, as he does in his book, to his *own great integrity and well-spent life*; for if he possessed even the very lowest grade of benevolence, and if his mind were not under the influence of the very worst, but most rare, species of hallucination, viz. that which essentially injures the *moral faculty*, he would publish his recipe, provided his medicine was capable of doing even the tenth part of the good which he pretends it can do. Every one knows that patent laws, by protecting property, tend to encourage the publication of medicinal, as well as other knowledge. Vile covetousness

ought not to be tolerated where human health is directly concerned. Every sound mind likewise knows that one essential error in morals occasions a host of like errors, if much opposition is to be encountered. But cool reason is not the weapon to be used to reclaim dishonest quacks, or their followers, especially if they have suffered their avaricious or other vile passions to render themselves half insane. We therefore introduce, for the edification of W—— S—— and his misguided party, and for the pleasure of others, the Cancer Quack. This curious piece of poetry was written and published several years ago by our much esteemed friend and preceptor, the late Dr. Lemuel Hopkins, of Hartford, (Con.) Its publication had then the very excellent effect of driving a noted cancer quack from that city; for mankind were so unfortunate, in those days, i. e. forty years ago, as to be annoyed by quacks, as well as at the present time, although not, perhaps, to the same degree. The rare talents of the quondam Hartford wits may be more wanted now than they then were. Ridicule, when properly directed, occasions much folly to shrink from public notice.

THE CANCER QUACK.

HERE lies a fool, flat on his back,
 The victim of a Cancer Quack,
 Who lost his money and his life,
 By plaster, caustic, and the knife.
 The case was this: a pimple rose
 South-east a little of his nose,
 Which daily redden'd and grew bigger,
 As too much drinking gave it vigour.
 A score of gossips soon ensure
 Full three-score different modes of cure;
 But yet the full-fed pimple still
 Defied all petticoated skill,
 When fortune led him to peruse
 A hand-bill in the weekly news,
 Sign'd by six fools of different sorts,
 All cur'd of cancers, made of warts!
 Who recommended with due submission
 This cancer-monger as magician.
 Fear wing'd his flight to find the quack,
 And prove his cancer-curing knack.

But on his way he found another,
 A second advertising brother ;
 But as much like him as an owl
 Is unlike ev'ry handsome fowl ;
 Whose fame had rais'd so great a fog,
 And, of the two, the greatest hog ;
 Who us'd a still more magic plaster,
 That sweats, forsooth, and cures the faster.
 This doctor view'd, with moony eyes
 And scowl'd up face, the pimple's size ;
 Then christen'd it, in solemn answer,
 And says, " This pimple's name is cancer,
 But courage, friend ! I see you're pale ;
 My sweating plasters never fail ;
 I've sweated hundreds out with ease.
 With roots as long as maple-trees,
 And never fail'd, in all my trials ;
 Behold these samples here in phials,
 Preserv'd to show my wond'rous merits,
 Just as my liver is in spirits.
 For twenty joes the cure is done."
 The bargain struck, the plaster on,
 Which gnaw'd the cancer at its leisure,
 And pains his face above all measure.
 But still the pimple spread the faster,
 And swell'd, like toad that meets disaster.
 Thus foil'd, the doctor gravely swore
 It was a right rose-cancer sore ;
 Then stuck his probe beneath the beard,
 And show'd them where the leaves appear'd,
 And rais'd the patient's drooping spirits,
 By praising up the plaster's merits :
 Quoth he, " the roots now scarcely stick ;
 I'll fetch her out like crab or tick,
 And make it rendezvous, next trial,
 With six more plagues in my old phial."
 Then purg'd him pale with jalap drastic,
 And next applies th' infernal caustic ;
 But yet, this semblance bright of hell
 Serv'd but to make the patient yell ;
 And, gnawing on with fiery pace,
 Devour'd one broadside of his face !
 " Courage ! 'tis done !" the doctor cries,
 And quick th' incision-knife applies,
 That with three cuts made such a hole,
 Out flew the patient's tortur'd soul !
 Go, readers, gentle eke and simple,
 If you have wart, or corn, or pimple ;

To Quack infallibly apply,
 There's room enough for you to lie ;
 His skill triumphant still prevails,
 For death's a cure that never fails.

8. Hallucination is not the only permanent change, which can be wrought upon the brain and its sentient spirit : for the will, or the principle on which that faculty depends, both in animals,—the horse and ox for instance,—can be artificially *changed, altered, or subdued*, so as to make the individual, on whom the change is wrought, more manageable and submissive. Without the process or discipline by which this change is effected, the horse would be nearly useless. It does not come within our plan to detail the process ; and those stubborn children, who from false tenderness, ignorance, or neglect, have never had their wills sufficiently broken when young,—to use a vulgar phrase, for we know of no other to designate the alteration alluded to,—often make turbulent and troublesome citizens during life. He who contemplates the sympathetic faults of many parents and guardians, will at once perceive the great importance of suitable school teachers, considered merely as political characters. Much discretion and judgment, as well as erudition, are needed by such teachers or disciplinarians ; for they have the difficult task of managing the parents as well as the children. We recollect that we once broke the will of a young man, eighteen years old, and probably for the first time, by venesection. He was thought by all who saw him to be insane ; but he was suddenly cured by having his will broken, as it was afterwards thought.

9. The human brain is altered from its most natural state, in an infinity of ways, or nearly so, to fit it for the multifarious employments which are needed, or at least required, in a highly artificial state of society. In this respect, mankind differ greatly in exaltation from all other animals ; but the means used to effect such important objects are often highly injurious to human health. Other animals are not equally liable to such evils. The present is too extensive a subject for us to dwell upon.

SECTION III.

THERE are certain natural, or nearly natural, conditions of the sentient and animal spirit, or of the brain, in its largest sense, which are not every day noticed, but which conditions the physician should understand ; among these are,

I. The fascinating power, or faculty, of animals, such as serpents exercise over birds ; and likewise that *faculty* in human beings, which enables some persons to occasion enchantment, fascination, bewitchment, animal magnetism, a trance, or any power of charming irresistibly, either for a good or for a bad purpose. These are *faculties* or *propensities*, by which the animal or mental spirit of one being operates upon that of another, by the aid of the animal organs. Of course, there is nothing supernatural in the art of the exorcist or modern enchanter, better known of late by the name of animal magnetizer. Experiments with animal magnetism ought not to be patronized to gratify human curiosity, because they tend to excite libidinous feelings, which sometimes puts one sex too much into the power of the other ; a very melancholy instance of which recently occurred in Berlin, in Prussia. See Russell's Tour in Germany. As mental causes may occasion general delusion, party or individual hallucination, private insanity, melancholia, and likewise fascination, the weaker mind should be protected by law, or by public sentiment, against the stronger one, if such power is too much misapplied or abused. Such a resource may be more needed in a large and compact community.

In the island of Ceylon, that huge, but very sagacious animal, the elephant, seems to possess a fascinating influence ; and a considerable number of the poor or feeble natives are every year destroyed by those animals in consequence of that faculty ; or, at any rate, such victims are made to fall

as if they were shot, previous to their enemy's touching and destroying them ; and this is done by the superior or greater influence of the animal spirit of the elephant over that of the victim. See Mr. Hume's recent communication respecting those animals, in the *Missionary Herald* for August, (1827) published in Boston. The transpiration of the animal spirit from the common cat has a very unpleasant effect upon some persons, even when the animal is not perceived to be present by the usual senses. Dr. Good says he has personal knowledge of such facts. Cats are known to have a fascinating influence over rats and mice. In fact, the transpiration from human beings, when too many are too long huddled together, is injurious and oppressive. The effluvia of living plants are sometimes noxious, even in the open air. Contagion is also propagated in a similar way.

2. The animal or mental spirit of the mother occasions powerful, and sometimes unnatural, effects upon her unborn offspring ; this, however, like many other obvious truths, evident when attended to, is denied by some.

3. Those imaginary vapours, as seeing an imaginary ghost, which are frequently experienced by persons in sickness, and from other accidental causes, even by those in good health, are probably occasioned by some unusual operation of the sentient spirit. Such cases often give rise to many marvellous stories, which sometimes produce durable effects upon society. In cases of optical illusions, the high probability is that the organic spirit of the retina, optic nerve, and likewise that of the brain, as combined with their more solid matter, caloric, light, and oxygen, if not electricity, are preternaturally excited, somewhat similar to what they have been accustomed to be, by their natural or usual stimuli, such as light. Opium, by the by, sometimes occasions such effects. Dreams, which are known to occur oftenest between the intermediate state of waking and sleeping, have been for many years noticed in our own person to resemble optical illusions, or odd combinations of ideas ; and they have a relation to such preceding thoughts and impressions as have recently occurred to one while awake. In elderly persons, however, these

thoughts and optical impressions may have been remote ones, and they may have been forgotten ones. Owing to an irregular or imperfect configuration of the sentient spirit and brain, those thoughts and impressions alluded to, are very defective, and are always either pleasurable or painful, and often ludicrous. Such, likewise, is the case in insanity, with this difference, viz. ; in insanity, and likewise in durable febrile delirium, the wrong associations of ideas, or the irregular or tumultuous action of the brain and its sentient halitus, is more permanent, vivid, or muttering, and likewise more obviously ludicrous and even mischievous in its effects, at least to bystanders ; and the patient is often highly pleased with his own mischievous and antick tricks. Others, with a view to the patient's benefit, should always show a decisive and unrisible disapprobation of such bad conduct.

Powerful sane minds, and agreeable and placid solitude in aid of the powerful *vis medicatrix naturae*, are very useful in curing insanity ; and manual employment may sometimes be so. In persons dying from disease, unless the brain or its halitus is disordered, the mind is often clear and vivid.

4. Animal spirit, even if confined to two separate parts, or different beings, has an affinity or propensity to unite. This causes an organized part, when completely separated from an animal, as a finger, or one's nose, to grow again to the animal by the healing process. Such a propensity also keeps together, by the aid of the animal organs, a flock of sheep, and likewise a flock of birds and a shoal of fishes. Plants being fixed to one spot, do not show this propensity so obviously.

5. Appearances lead to the conclusion, that the animal soul, in the calm production of trains and tribes of ideas, occasions configuration in connection with the upper part of the brain. But when the passions occur, the sentient spirit, if not a part of the less sentient animal spirit, probably operates upon or in the whole of the medulla spinalis and nerves, as well as upon the upper part of the brain. Hence, in such cases, the eyes weep—the lungs sigh—the heart palpitates—the bowels

yearn—the skin becomes either red or pale, as the case may be—the hair and feathers, which may grow on the highly nervous skin may become erect. The vocal organs are known to acquire from passion a propensity to low, or moan, or to laugh, as the case may be—the teeth to bite—the hands or claws to strike or scratch. The arms, lips and genital organs, when tenderly affected by amorous passion, likewise suddenly acquire a propensity to fondle. This last propensity is supposed, if not proved, by Dr. Gall and others, to have its principal seat in the cerebellum, or in its vermiform part. Many, if not most, of the nerves, and the whole of the brain, including the medulla spinalis, are probably agitated by the animal and sentient spirit, in such cases. This opinion originates from a view of the relative situation of all the parts affected. Although an individual's consciousness, which arises from sensation, reminiscence and ratiocination, might teach him that the human soul, when produced, is a unit, or single principle somewhat compounded, it could never teach him the nature of the very complicated machinery upon which it acts. Anatomy, and such men as the late Dr. Gall, must teach him such very needful knowledge. The mere metaphysician should bear this in mind; otherwise he is liable to commit an host of errors.

6. There is an important condition of the sentient spirit and brain in dying persons, which has been often noticed by clergymen, which has been too much neglected by physicians. This condition is better described by the poet in the subsequent lines, than can be done by us.

“ Vital spark of heav'nly flame !
 Quit, O quit this mortal frame !
 Trembling, hoping, ling'ring, flying ;
 Oh ! the pain, the bliss of dying !
 Cease, fond nature ! cease thy strife,
 And let me languish into life.

Hark ! they whisper, angels say,
 Sister spirit, come away.
 What is this absorbs me quite,
 Steals my senses, shuts my sight,

Drowns my spirit, draws my breath?
Tell me, my soul! can this be death?

The world recedes, it disappears!
Heav'n opens on my eyes! my ears
With sounds seraphic ring:
Lend, lend your wings! I mount! I fly!
O Grave! where is thy victory?
O Death! where is thy sting?

In dying persons, the sentient spirit and its organization operate very variously in different cases. The patient is sometimes alternately in a sleep or awake, in a morbid manner, however, attended with laborious respiration, constantly increasing for many hours, together with absence of pulse, coldness, and many more morbid configurations of vitality. *Often there is a vivid and sometimes a very rational excitement of the brain and its assistant organs, just before the patient breathes his last. And if the person is pious, his associations of that description show themselves in full force in audible speech, in a manner somewhat like what has been so beautifully described by the poet, much to the comfort of pious friends.*

Human beings easily satisfy themselves, that they have had a beginning. They are, however, very unwilling to believe that they themselves shall have an end. This propensity is a source of great comfort and utility in society; and it may have been implanted by God in us, as part of our nature, partly at least, on account of the comfort it occasions, and partly as evidence that we shall not be disappointed.

7. The sentient spirit, in its operation, may be divided into that which is good, and into that which is bad, as viewed by us. Hence it is very natural that spirits in another world should be so divided likewise.

SECTION IV.

I. IN great cities too many causes, which excite animal motions, exist for the physical good of the inhabitants. The fact, that human beings are liable to deteriorate, physically considered, in large cities, is admitted among physicians: but the cause most generally thought of, is bad air, and want of suitable exercise. But, when we consider that domestic animals, as sheep, in too large flocks, deteriorate and become sickly, and that men do so likewise in large armies, other causes, as well as bad air, may be supposed to operate. Many of the human race in cities become nervous, dyspeptical, consumptive, enfeebled, and short-lived; and the evil does not stop here; for they propagate, and leave behind them a feeble race like themselves. Besides, in large cities it is almost impossible to avoid many of the exciting, pleasurable, but hurtful causes existing in such places; and, by the by, it is believed that literary and intellectual persons are more easily hurt by such causes than others, they being predisposed thereto by their necessary avocations. Thus it is evident, that the vital or organic spirit, or steam, as it is too often directed in its operation in the pursuit of various kinds of pleasure, is made to operate too vehemently upon the brain, nerves, and genital organs, for the physical good of a human being. Society, however, may sometimes be benefited by causes which lead to the sufferings, and even destruction of individuals.

Excessive muscular movements have their evils also, as well as those that are mental and sexual; but, fortunately, as the greatest proportion of mankind must live by the sweat of the brow, it is so ordered, that the former movements, by being less agreeable, are not so liable to be excessive as the latter. As evidence designed to convince every one of the correctness of what has just been said, the following facts

are mentioned. In the country parts of the State of Connecticut, one fourth part of the inhabitants, nearly, if not quite, live to the great age of seventy years and upwards; whereas, in the city of New-York, only one among twenty-four of the citizens ever arrive to so great an age.

The reader is not to regard the above opinion respecting longevity in Connecticut, as founded on exact data. Bills of mortality have, however, been kept in a parish of the township of Groton, which prove such a fact, as is now alluded to, so far as regards such parish; but from our knowledge of Groton and many other places, we do think, that the parish alluded to favours longevity more than many other hilly parts of the state.

It is ascertained that, in London, one in twenty died annually, but lately, only one in forty; while in the most healthy open country (England,) one in sixty is the proportion of annual deaths. Besides, the sum total of healthy and comfortable existence, among the whole mass of the people, is much in favour of the country. But in the more airy, and recent city of Philadelphia, it is said, that the proportion of deaths annually does not exceed one in fifty-one, *among the white population*; and in New-York, the proportion of deaths annually is one to forty, as is supposed by good authority. This calculation is supposed to include the coloured population; thus the proportion of mortality in these two cities may be nearly equal.

2. The remedies for such evils, as have been pointed out, consist in avoiding or moderating their causes. Hence, a residence in the solitude and pure air of the country, or in a village, or in the less compact part of a small town, and moderate muscular exercise, and moderation, in what is taken into the stomach, and temperate mental and sexual pleasure, is so eminently calculated to impart health, vigour, and long life to human beings, and likewise to ensure a vigorous progeny. Distinction and fame, however, if that be the principal object of one possessing energy and talents, is not so soon, so certainly, nor so easily obtained, in such a retired situation, as in that of a large city, or in an army, or at a court.

3. From what has been said respecting cities, we wish not

to be thought so Utopean, as not to acknowledge their great political importance. Our main object is to teach, with due humility, our readers and patrons, how to avoid some of their evils.

It must be admitted, that the productions of art, which abound most in cities, are more pleasing to adult human beings, than those of nature in general; but then their use in those places is very liable to be injudicious. Besides, many of the evils arising from art, and the great restlessness of mankind in cities, cannot be avoided. Living in the country is like being buried alive, in respect to daily agreeable excitation, when compared with residing among a large and select society; but then solitude is the easiest and the most wholesome.

If our ideas respecting a city and country residence be correct, our readers may be helped in deciding how far they will prefer short-lived pleasure, to more durable profit. For those, in the first place, who regard a long and healthy existence, and a plenty of subsistence, and early matrimony, and less exhausting thought, as the *summum bonum* or greatest good, will prefer the country or village for a residence. In the second place, those who may choose a shorter, but merrier and more feverish life, will reside in a city. And in the third place, those who possess the means may prefer a union of the two modes of residence, to which we now allude. A land abode is better than one upon the water; and one upon a hill is more wholesome than one in a vale. The land air in the open country, although less pure, is more invigorating than that of the ocean. The facts above considered may help in deciding where seminaries for education, and some other public institutions, should be located, especially in new countries.

SECTION V.

WHENEVER the human brain, or mind *notices* any peculiar fitness between natural causes and their effects, it has an *irresistible propensity* to ascribe *intelligence* to the Cause of that fitness; which Cause philosophers distinguish by the name of the *Great First Cause*. The rest of mankind express nearly the same idea by the name of God, Deity, or some word of similar import. Human brains, or human creatures, have a natural inclination, or propensity to ascribe various peculiar attributes—similar to those which themselves possess—to said Cause of causes; or, in other words, to God. These attributes they, however, suppose to be of a very exalted nature. From this view of the case, it is evident that the very structure of the human brain is such, that whatever else mankind may be, whether Christians, Pagans, or Mahometans, they *unavoidably or necessarily* agree, whatever some may say to the contrary, in being *Theists*; for the word atheist is a negative term, and means nothing.

Mankind also, especially in their most civilized state, in consequence of observing the phenomena of nature, necessarily agree in another very important respect, namely, in that of ascribing great power and goodness to the omnipresent Cause, or to God. They likewise agree, that similar qualities in human nature are the most desirable. Hence we have the consolation of knowing that great efforts will always be made, although such efforts may not always be judicious ones, to maintain, in a considerable degree, among mankind such very useful qualities.

“ Know, then, thyself; presume not God to scan;
The proper study of mankind is man.”

POPE.

The above lines may be good poetry, but their philosophy is too confined to be agreeable to the taste of a very respectable portion of mankind. The human mind, in such per-

sons, chooses—*whether proper or not*—to rove through all creation, and soar into futurity ; and likewise to scan the **VERY ATTRIBUTES OF GOD HIMSELF**, or the Great First Cause. How far such speculations may be agreeable and profitable, is left for others to decide.

It is extremely natural, in civilized life, that frail beings should feel an accountability to such an august being as God, whose very essence is beyond the reach of their comprehension ; and it is judged proper by most people that so very useful a propensity should be cultivated.

Physiological or Metaphysical Mementos.

THERE is a sentient spirit, and a sexual one, in all animals, originating constantly from a general halitus, or from the circulating blood ; the former is perceived to act constantly when an animal is awake, the latter only occasionally, and during a limited period of life. The former, aided by organization, occasions tranquil pleasure ; the latter, that which is tumultuous. Among mankind, the former pleasure is enjoyed in public, the latter in private. Both kinds of pleasure and spirit are more liable to abuse or injury by human beings than by any other animals ; and each spirit can likewise be modified and improved in action by education or habit. The mental one, however, especially among mankind, admits of a much greater variety of alteration or improvement, than that which is sexual. The former spirit is likewise changed in some measure by an alteration of the latter, owing to a sympathetic connection that exists between them. This alteration may be occasioned by education or habit, by disease or accident, by age, or even by emasculation.

The first external agents of life are oxygen and atmospheric pressure. Painful sensation, at birth, occasions inspiration and expiration. In this manner the breathing apparatus, like a mechanical bellows, is first put in operation, and afterwards continues to act, until death.

CHAP. V.

A Devotional and Mechanical View of the Human Body.

(FROM THE CHRISTIAN PHILOSOPHER.)

I. "THE economy of the human frame, when seriously contemplated, and with a view to the useful and very pleasing gratification of one's devotional feelings, has a tendency to excite admiration and astonishment! What an immense multiplicity of machinery must be in action to enable us to breathe, to feel, and to walk! Hundreds of bones of diversified forms, connected together by various modes of articulation; hundreds of muscles to produce motion, each acting in a variety of different capacities; numerous tendons and ligaments to connect the bones and muscles; hundreds of arteries to convey the blood to the remotest part of the system; still more numerous veins to bring it back to the heart; thousands of glands secreting humours of various kinds from the blood; a vast number of lacteals and lymphatic tubes, absorbing and conveying nutriment to the circulating blood; millions of pores through which the perspiration is continually issuing; an infinity of ramifications of nerves or sensitive matter, diffusing sensation through all parts of this exquisite machine; and the heart, at every pul-

sation, exerting an astonishing force in order to preserve all this complicated machinery in constant operation! The whole of this vast system of mechanism must be in action before we can walk across our apartments! We admire the operations of a steam engine, and the force it exerts; but though it is constructed of the hardest materials which the mines can supply, in a few months some of its most essential parts are worn and deranged, even although its action should be frequently discontinued. But the animal machine, though constructed, for the most part, of the softest and most flabby substances, can go on without intermission in all its diversified movements, by night and by day, for the space of eighty or an hundred years.

2. "The study of the animal economy has a powerful tendency to excite emotions of gratitude."

"The science which unfolds to us the economy of our bodies, shows us on what an infinity of springs, and motions, and adaptations our life and comfort depend; and when we consider, that all these movements are performed without the least care or laborious effort on our part, if we be not altogether brutish and insensible of our dependence, we must be filled with emotions of gratitude towards Him, "whose hands have made and fashioned us, and who giveth us life and breath, and all things." Some of the motions to which I advert, depend upon our will; and with what celerity do they obey its commands? Before we can rise from our chair, and walk across the room, numerous muscles must be set in motion, every one of which must be relaxed or constricted, just to a certain degree, and no more; and all must act harmoniously at the same instant, and at the command of the will. When I wish to lift my hand to my head, every part of the body, requisite to produce the effect, is put in motion: the nerves are braced, the muscles are stretched or relaxed, the bones play in their sockets, and the whole machine concurs in the action, as if every nerve and muscle had heard a sovereign and resistless call. When I wish the next moment to extend my hand and foot, all these muscles are thrown into a

different state, and a new set are brought into action : and thus we may vary, every moment, the movements of the muscular system, by a change of our volition. Were we not daily accustomed to such varied and voluntary movements, we would be lost in wonder and astonishment !

“ There is one peculiarity in the constitution of our animal system, which we are apt to overlook, and for which we are never sufficiently grateful ; and that is, *the power it possesses of self-restoration*. A wound heals up of itself ; a broken bone is made firm again by a callus ; and a dead part is separated and thrown off. If all the wounds we have ever received were still open and bleeding afresh, to what a miserable condition should we be reduced ? By a system of complicated powers, such dismal effects are effectually prevented ; in short, when we consider that good health depends upon such a numerous assemblage of moving organs and parts, and that a single important spring out of action might derange the machine, and put a stop to all its complicated movements, can we refrain from joining with the Psalmist, in his pious exclamation, and grateful resolution, “ How precious are thy wonderful contrivances, O God ! I will praise thee, for I am fearfully and wonderfully made ! ”

N. B. We can discover, in part, the mechanism of our own bodies, so ingeniously contemplated by Mr. Thomas Dick, by the analysis of others, resembling ourselves, when dead. But the true physiologist, whether physician or metaphysician, should constantly bear in mind, that the *vital* properties of the atoms, or corpuscles of which we are composed, are infinite in their configurations, or changes, whether such atoms belong to the spiritous or more solid parts of us. Of course, a limited brain can never do more than to approximate towards the truth, in such a case.

CHAP. VI.

SECTION I.

On the Trepine.

A SUITABLE instrument for making a circular perforation in the cranium is, in certain cases, even now, a desideratum in surgery. Two instruments have been in use for such a purpose, namely, the trephine and the trepan. There is needed a circular saw, and *likewise the power of conveniently moving such a saw in one circular direction.* The motion now alluded to enables the teeth of the instrument to keep free of any entanglement from the saw dust which is made, and likewise enables said teeth to operate constantly and steadily on the hard bone to be cut; but in case the saw is moved alternately in half circles, the teeth operate one half of the time upon the saw dust already made. No advantage is gained thereby, but there is time and labour lost, and more pain rendered. Besides that difficulty or inconvenience, the hand of the operator necessarily gives the instrument a wriggling, jerking, and unsteady motion, when moving the instrument in half circles. These inconveniences are so great when the common trephine is used, that many of the ancient surgeons, and some of the moderns, pre-

ferred the use of the trepan, notwithstanding the inconvenient and unsteady distance at which that instrument placed the hands of the operator from the site of his operation.

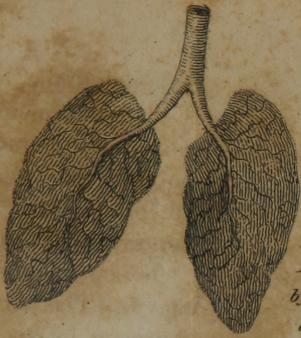
The inconveniences attendant upon both the trepan and the common trephine may be obviated, or, in other words, the benefits of both of those instruments may be united in one instrument, by simply adding a circular handle to the common trephine. See the plate, fig. 1. This simple alteration of the trephine enables the surgeon, by the aid of one hand, and the fore finger and thumb of the other, to make the circular motion wanted, with small, but unimportant interruptions. His hands are likewise near the site of his operation, where, to ensure their greater steadiness, they ought to be. In order to save room in a case of instruments, the side or end of such box or case may be cut away, so as to leave the handle of the trephine on the outside of the case. This obviates the only objection which has been made to the improvement now recommended.

SECTION II.

On the Trocar and Speculum Oculi.

THE more simple an instrument is, the better, provided it completely answers the purpose for which it is intended.

A steel tube with holes in it, a sharp point, and a suitable handle, is the only instrument needed for drawing off water in a case of hydrocele or other dropsy. The danger to be apprehended from the point of such tube, when permitted to rest in loose contact with the *tough animal membranes*, is merely ideal. The present author has used such a



The Lungs acted on by atmospheric pressure and oxygen,

are

essential to

the formation

and circulation

the nutritious

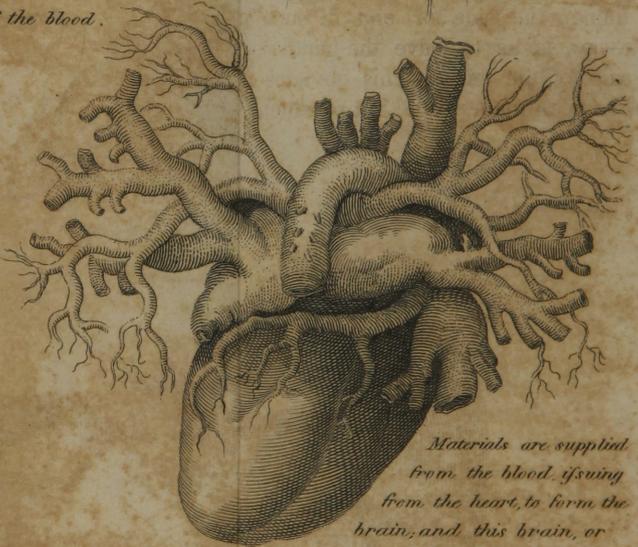
of the blood.

parts of the

food, beginning

to become alive.

Chylepoietic Viscera are essential to furnish materials for the blood, which is done by the lacteals absorbing



Materials are supplied from the blood, issuing from the heart, to form the brain, and this brain, or sensitive matter, forms the sentient spirit.



The Heart by means of the blood vessels supports and provides with blood all parts of the system, and from this blood the solid and fluid parts, and animal spirit are made, among which parts is the Semen, which by means of the sexual organs continues the species.

Fig. 3. p. 131.

Fig. 2. p. 131.

Fig. 1. p. 130.

tube for a number of years, a representation of which is given in the plate, fig. 2.

In consequence of showing to a friend my improved trocar, as I then supposed it to be, I had an old Latin book put into my hands. Said book was published in the year 1672, by one PAUL BARBETTE, M. D., a celebrated surgeon of Amsterdam. There was in that book a representation or figure of a similar tube to that of my own. The account DR. BARBETTE gives of his instrument is the following: He informs his readers that one JACOB BLOCK, a celebrated surgeon, brought from Italy a *silver* sharp-pointed tube, which was used for the operation of tapping. DR. BARBETTE thought such a tube of so much importance, that he gave a figure of it in a plate. It occurred to DR. BARBETTE that it would be an improvement upon DR. BLOCK's instrument, to cause a similar one to be made of *steel* instead of silver.

It appears from DR. HEISTER's system of surgery, that he knew there was such an instrument as "a hollow sort of lancet" to use the Doctor's expression; but then, DR. HEISTER supposed that instrument was made of silver, and that it was the invention of DR. BARBETTE. It is evident DR. HEISTER never saw the instrument, or the book of DR. BARBETTE; for in case he had, such a misstatement would not have been made. DR. HEISTER concludes by recommending the common trocar which is now in use. Thus it would seem that a useful discovery may be lost, and superseded by one less beneficial.

For several years past the Speculum, now represented in the plate,^(t) has been used by us, and we find that it conveniently aids the fingers in effecting the object for which it was designed. The ring is put in suitable contact with the eye, and by resting or placing the fore and middle fingers upon the wings of the instrument, one is enabled to steady both the eye and the eyelids. The pressure on the eye, when an instrument is made to touch its membranes, should be a little increased, and so kept until its muscles

(t) See plate, fig. 3.

become somewhat fatigued, when such pressure may be diminished. The ring touching so many points, makes very little force needed;—not enough to occasion permanent irritation. A great mechanical advantage is gained, when every movement necessary to delicate operations can be directed by one, instead of two, hands. The fingers should also be nigh the site of such operations. For this last reason, and likewise to insure steadiness and precision, eye-scissors should have a spring, *properly placed*, of suitable elasticity to open their blades.

CHAP. VII.

THE RIGHTS OF ANATOMISTS

VINDICATED;

Or, a series of Essays, to show the great mischief insidiously done to the whole community by public law, more particularly the one recently made in Connecticut, in relation to the exhumation of the human body; which law converts the slight offence of trespass, into the heinous one of felony; thus violating a fundamental principle of natural religion; by VESALIUS.

JUSTIFICATION.

From the Political Constitution of the State of Connecticut.—Clause 5. “Every citizen may freely speak, and write, and publish his sentiments on all subjects, being responsible for the abuse of that liberty.” Clause 6. “No law shall ever be passed to controul the liberty of speech or of the press.”

“DISINTERMENT.—Our remarks relative to Disinterment, for the purposes of anatomical and medical instruction, given in our paper of 31st ult. have elicited a course of interesting observations from a writer under the signature of VESALIUS, (an eminent anatomist, cruelly persecuted in ancient times.) The article is given below; and, to gratify a correspondent, we prefix our remarks, as in our paper of Dec. 31st.

If the means of instruction for medical and surgical students in the science of Anatomy, are of such vast importance to the alleviation of human suffering, and the consequent promotion of human comfort;

If the skill derivable from the dissection of human bodies,

is, confessedly, the most effectual, if not the only means of attaining this science :

If the number of subjects on which students can operate, or professors lecture, is wholly inadequate to the purposes of general instruction ; and,

If the practice of disinterring dead bodies outrages all our notions of public decency, violates the law of the land, and wounds, acutely, the feelings of bereaved surviving friends ;

How, then, can such subjects, in such numbers as to be in any degree adequate to professional and (of consequence) the public wants, be procured ; and yet so as to avoid wounding public feeling or public prejudice ?

This is an interesting question, requiring neither science, nor professional skill to answer." *Edit. of Canal of Intell.*

ON A PUBLIC LAW OF CONNECTICUT, RELATIVE TO
DISINTERMENT.

MR. EDITOR : Suppose the human bones, or even the more recent subject, a human body, should happen to fall into the possession of some surgeon, whose professional duty might require that he should perform surgical experiments upon them ; and suppose, likewise, that the surgeon should be so unfortunate as to know that the person who furnished him with those remains of a human being, had broken the law respecting exhumation ;—does such knowledge subject the surgeon to the punishment of the State Prison, for ten years or less, and to pay a heavy fine ? It is obvious to the meanest capacity, that such a law would be unjust and unreasonably severe. And yet it is believed that such must be the operation of a law of Connecticut, unfortunately passed in 1824.

The law in question seems to suppose that the act of removing the human remains secretly from the grave, is theft, or other high crime. The propriety of this may well be

doubted.—For it is evident that those remains cannot be considered as *property* which may be useful to one, or like money, which is easily transferable from one person to another, and which is useful to each possessor. Neither are those remains owned by any one; and the grave clothes, if taken, are property to which the former owner or owners have relinquished all claim; for it is obvious that no further use of such property is intended—Sir William Blackstone's opinion to the contrary notwithstanding.

The act now under consideration, may, or may not be a trespass, according to the circumstances of the cases. It is admitted, however, that it is sometimes so foolishly and imprudently done, as to occasion great mischief and excitement; and the person who does such an act, should be punished accordingly. He should be punished for disturbing the public peace; not for injuring a dead body, nor for theft. For no such crime exists in such a case.

It would be difficult to show that the *policy of society* requires, that the privately removing a dead body from the grave, if it be decently done, should be regarded as theft or any other high crime. The indignation or resentment of the most ignorant part of the public, and of the relatives of the deceased, (even in the most civilized state of society,) which is excited by the discovery of such an act, however innocent it may be, when rationally considered, is experimentally proved often to be very great. This cause alone, *even without the aid of law*, is abundantly sufficient, in general, to secure a proper degree of caution in the means made use of by careful surgeons, to obtain subjects for dissection. And no one, it is presumed, would pretend that it was immoral to dissect the human body, provided it be done from *correct and benevolent* motives, and so as not to disturb the feelings of any one. *The doing a thing privately can be no crime, unless the act done be an improper one.*

Legislators should coolly consider whether the occasional and rare evil occasioned by exhumation and dissection, make any particular law expedient on such a subject, unless one may be needed to protect surgeons in the performance of

their duty in such cases. Every evil, as every one knows, cannot be remedied by law, however judicious. In the particular case now under consideration, it would seem that the particular evil to be apprehended, or anticipated, and the natural remedy, are so intimately blended, that the occurrence of such an evil would not be very frequent, were there no particular statute on the subject. Experience and history prove this formerly to have been the fact. Discreet surgeons have intelligence and ingenuity enough, to manage properly that painful and dangerous, but highly necessary part of their business. Young men, however, sometimes get into trouble.

The whole history of anatomy and surgery, if attended to, will show, that the business of secret dissections is carried on extensively, at the present day, in every scientific country, and by medical men of the purest morals and greatest humanity. And such distinguished men judge, that public decency requires that such an odious, but necessary business should be done privately.

The history of general society will satisfy every one, that this very useful business is managed with so much prudence and art, by such humane characters, that the peace of society is but seldom disturbed. Indeed, the great superiority of modern surgery over the ancient, is owing principally to such management.

It was doubtless contemplated in the formation of the late law, that those who might find motives to evade it would be very artful in effecting such an object. But it should have been considered also, that those motives are not those of a felon, but grow out of those of an entirely opposite character, and such as are commendable in the highest degree, viz. a wish to acquire the *ability to benefit the living, when sick and lame.*

It has been admitted, however, that such worthy persons should be liable to damages, for wantonly or imprudently injuring the feelings of any one. The dead they cannot injure. This should be perpetually remembered, while the living are liable to be injured, by ignorant and unskilled surgeons.

Our whole conduct, and all our regulations and laws on this highly delicate subject, should be coolly, humanely, and very prudently managed, having reference to the rights, the tender feelings, and even the wrong associations of the living; for the dead, on their own account, require no protection. The truth is, our kind and benevolent fellow-feelings, and associations towards the living, continue to be exercised towards them when dead. This is of no importance in any way, as respects the dead; but is often a fruitful source of evil, as well as good, to the living; and men of the most cultivated minds, even when they are not under the influence of political delusion, seem not to be sufficiently aware of this, when they make laws on the subject. There is another truth, which should not be forgotten, viz. *those whose duty it may be to dissect the human body, have a claim upon the protection of law, as well as other citizens, provided they conduct their business with decorum and propriety.*

The necessity for anatomical dissections is now generally admitted. This is made indisputable by the proviso in the law above referred to, but it unfortunately happens that said provision is completely inadequate to the purpose for which it was designed, for not so much as one dead body could be yearly had by that provision from the whole State. This will undoubtedly injure the sick and lame generally, and will also create a kind of monopoly in favour of a few surgeons, who are now in actual practice. They, of course, in general, will keep silent on this subject. Such a monopoly is opposed to the very nature of our government. The influence of the well-disposed, notwithstanding, ought to be used in favour of those who have been willing to encounter the expenses, loathsome labor, and even danger, necessary to qualify themselves for a business so unpleasant as that of operative surgery.

Hitherto, with suitable secrecy, a few surgeons in this country have been able to qualify themselves for their business, without *often* disturbing the public peace or decorum; but in future, it will be next to impossible, in Connecticut, to accomplish so desirable and necessary an object, for those who may be sick, or bruised and wounded, by the accidents

of human life. At present, there are only two alternatives for the Connecticut surgeon—one is, that he is liable, on the one hand, to be summoned before a court of justice for bad practice, by one law, and by another he is made liable, if he make use of the means to prevent such mal-practice in his profession, to be treated as a criminal, and sent to Newgate Prison. Society, or the government, in this case, have done obvious injustice to a very respectable part of the medical profession, and likewise to those who may be so unfortunate as to need the aid of surgery. This injustice, however, was not probably designed. But we would ask whether this is treating an intelligent profession with that respect to which it is entitled? For no other class of citizens is required any law on this subject.—Is the medical profession so fond of disturbing the public peace, as to make so severe, if not unjust a law expedient? Ought not the opinion of the MEDICAL CONVENTION, as one small part of the government of the State, to have been taken, previous to the passage of such a law? There is not much indecorum, however, in such neglect, owing to the Hon. Legislature having been too often troubled by the medical convention about some trifling affair, as viewed by the community. Are there not *enough* of those who have been useless, and worse than useless, while living, that can be made useful when dead?—Have not society a right to make the dead useful, as well as the living, provided they do not trespass on public decency and propriety? There is obviously more humanity in thus making use of dead subjects, than in ignorantly practising upon the living. For the former are incapable of suffering; but living subjects, especially surgeons and their patients, are often made to suffer these evils, by the overbearing selfishness of the community.

Cannot intelligent medical men be trusted to manage their own business in their own way, even if decency makes secrecy sometimes necessary? Does the present state of things meet the real claims of our fellow-men, suffering under diseases of the body, and wounded limbs? Is it not relinquishing (considering the present highly improved state of

surgery) a real improvement in science and practice in this profession, and sacrificing one of the most urgent claims of suffering humanity, to unreasonable pride, passion, imbecile feelings, and false humanity? Cannot the most intelligent part of the community, in this enlightened period, be made to tolerate the lesser evil, for the sake of the greater good? Ought not the influence of good men in every profession, be used to meliorate the condition of those, who may be so unfortunate as to suffer in consequence of the law referred to? And that there will be many who will thus suffer, admits of demonstration. The clerical profession might be useful in this way; for we believe there is nothing in the Holy Bible against disinterment or dissection.

We wish to suggest, whether those who conduct the public presses ought not occasionally to aid in this object of humanity, instead of cherishing and exciting—as has hitherto, too often been done—superstitious and unreasonable passions? And ought not those presses to vindicate the rights of the living sufferer, whether he be surgeon, or whether he be his patient? for it is perfectly evident that justice is unreasonably withheld from both.

There is no difficulty in foretelling, that the law in question will be regarded by the intelligent part of posterity, as showing no more wisdom than some of the very ancient laws of the State.

The modern practice of secret dissection, like vaccination, is so eminently beneficial, that it ought never to be relinquished. Surgeons have been very unjustly driven from *their country*, to other countries, in pursuit of this important surgical knowledge. This has caused pecuniary draughts upon themselves and their country. This we know from correct information and personal experience. In the year 1794, we visited Philadelphia, on purpose to obtain the information which dissections afford. It is true, however, that there was, at the time, no public medical school in Connecticut; but now, such a want is very properly supplied by the Honourable Legislature of this State; but, *strange to tell*, the instructors are not permitted to use, in their *own scientific institution*,

the means of knowledge and improvement in medical and surgical practice, which constitute the principle of medical institutions in any country. The obstacles thrown in the way, as respects the acquisition of medical knowledge, much increases medical fees; and this injures the whole community. If the obstacles alluded to were removed, the practice of operative surgery is no more difficult than that of many of the mechanic arts. One among the numerous advantages which the surgeon derives from personally dissecting the human body, when dead, is, that it gives him that mechanical dexterity, self-confidence, and self-command, which he so much wants, during the moments of performing surgical operations.—Experience has proved that dissections do not produce any insensibility nor inhumanity in the surgeon, to counterbalance the benefit thus obtained.

Those who know us will be sensible that, on account of our advanced age, we have no personal interest to excite us in what has been written on Exhumation and Dissection. This publication has been delayed a considerable time, so that those humane but injudicious passions might subside, which occasioned the law complained of; otherwise one could not expect to be candidly heard or coolly attended to.

The younger part of the medical profession should be apprised that great knowledge, wisdom, courage, integrity, prudence, and often secrecy, are requisite to ensure self-respect, and likewise the peace of society. Physicians must serve and labour for their imperfect fellow-beings, such as they find them. In the discharge of their duties, few professions, if any, have oftener to encounter *prejudice*, which has been most beautifully and ingeniously personified by a late poet :

“Prejudice

Hath neither eye nor ear, a ready tongue
To speak at large in *generals*; it shuns
Particularity, as prone to lead
To nice investigation, and the *test*
Of *open* evidence. It swallows down,
As doth the ostrich, iron—lays an egg
Upon the sand, and leaves it—stalks,
Full of importance, or stands still

And slumbers, in supposed security,
Hiding its head, and thinking none can see.

We are aware that many statesmen admit that exhumation is necessary to the study of anatomy. Such characters, however, think that the peace of society requires *penal laws* to restrain the too great zeal of young surgeons within reasonable limits. Are such laws *just* as respects surgeons?—is the question to be settled.

If a law were to be proposed for the protection of anatomists, it may be asked, whether the modern principle, or opinion, prevailing among those persons, is correct? The opinion or belief is, that temporary secrecy is absolutely needful in their business. The propensities of mankind are, however, such, that the *abstract knowledge* of such a business gives no offence; *but the time and the manner in which human dissection is done cannot be made known to any neighbourhood, without giving very great offence, and almost always occasioning great excitement, and some riots.*—If such a principle or opinion, as is now alluded to, is both correct and expedient, ought not discreet and secret management to be permitted to be pleaded before a court of justice, in mitigation of damages, for trespasses which are evidently so beneficial to the sick and lame, as those which may be committed by anatomists, or by their agency? And does not true humanity require that punishments in such needful cases of trespass should be very light, *unless the particular offence be very great?* Would not the peace of *respectable relatives* be sufficiently protected by such a procedure? It is believed that the feelings of *such relatives* would not be very liable to be injured, if the public law was less severe. The hasty and indiscreet passions of the multitude, and of the relatives of the dead, even if such relatives should happen to be respectable, as well as those of young surgeons, require to be governed in these as well as in less difficult cases.

It is capable of very convincing proof that excessive legal punishments, both in this country and in Great Britain, have hitherto very much injured many of those, who are so unfortunate as to need the aid of the healing art. Ignorant preju-

dice, and not cool enlightened reason have occasioned such inhuman punishments. In France, if not on the continent of Europe generally, the case is very different. The French people, in this one respect at least, have shown both more wisdom and humanity *to the living*, than the English, or their descendants, the Americans.

There are many persons who will suffer their feelings to be painfully excited by a surgeon, in consequence of an operation upon their own bodies, who would seek vile revenge upon the same surgeon, if he should injure their own sympathetic or proud feelings in the performance of a similar surgical operation upon one of their dead relatives, however useful to the living, or even to themselves, such an operation might ultimately be. And this vile revenge such persons would seek, even if it should be perfectly evident that the surgeon had no real intention of injuring those feelings now alluded to. Such, alas! is the weakness of human nature. Courts and juries should be aware of such propensities among mankind, when called on to award suitable damages in such cases; otherwise, selfish persons may improperly avail themselves of great public excitement in obtaining unreasonable damages, or, in other words, they may make too much money from their dead and useless relatives.

Even governments cannot always render secrecy unnecessary to the personal safety of the surgeon, in the performance of many of his duties, for he may be in danger from illegal violence.

In illustration of this sentiment, the subsequent record is used.

“ In April, 1783, there was a great riot in New-York city, (improperly) called the *Doctor's Mob*, occasioned by indiscreet exposure and dissection of dead bodies at the Hospital. The mob attacked the jail in a furious manner, to massacre some of the physicians, who had taken refuge there, but they were repulsed, and several persons were killed.” Thus, to ensure the very trifling object of natural putrefaction of the dead, the living will kill each other. We have evidence of about a dozen riots from a similar cause; and some

of these were occasioned from the legal dissection of criminals, where there had been no exhumation. *Wm. Mackenzie and others, of course, are much mistaken in supposing that exhumation alone is the cause of riots in such cases.* Hence we believe in the necessity of secret decorum in practical anatomy, as well as in the practice of midwifery; and that public law should be founded on such a basis. Such decorum can be easily had in populous cities.

We are fully aware that statesmen do not like to tolerate, much less to encourage, a secret mode of doing any kind of business, lest real mischief might sometimes be the result. But every evil cannot be prevented by public law; and, with due submission, it is asked, whether, in such a difficult case as the one under consideration, an exception to a general rule may not, with reasonable safety, be made?

It may enlighten ill-informed statesmen to mention, that the punishments inflicted upon those low characters in Edinburgh, who are called, in a cant manner, *resurrection men*, have been so great, that it has enhanced the price of anatomical subjects so much of late, that, horrid to tell! murders have been actually committed by those detested wretches, in consequence thereof; and to the immense number of thirty persons, as printed reports say. The resurrection men have judged that it was safer for them to kill, for sale to the surgeons, miserable human beings, rather than run the risk of obtaining dead bodies by exhumation.

Surgeons in this country should procure their needful professional means, by their own ingenuity, and not employ vile or wicked characters to do any business for them, as is done in Great Britain. The anatomists in that country may, however, have been compelled by their government, to injure *the living*, by patronizing bad and ignorant men; *not by dissecting the dead.* For there is no crime in that, nor in procuring the means, *if it is properly done.*

One would think, that there were facts enough to convince the statesmen in Great Britain, if not here, that old-fashioned and barbarous punishments in the case before us, were much worse than useless; and that, instead of preventing exhu-

mation and practical anatomy, such measures only generate crimes, and even murder, by enhancing the price of anatomical subjects.

The anatomists know, that the very best good of society, and of themselves and dear families, when sick and lame, makes practical anatomy one of the necessaries of life.—Of course, the means for the cultivation of that science will be had, *even at very great risk and expense, and some small trespasses.*

* Suppose a lenient plan, as respects law, should be first tried in Connecticut, as the opposite one has not succeeded *any where*. Might not the State, by so doing, redeem its lost character among men of sense, for the late cruel law passed on this subject? But there is too much reason to fear, that the State will adhere to its law, for a considerable time, upon the old, convenient, or lazy plea of consistency. Public bodies move slowly, although they may ultimately get nearly right. In illustration of this opinion, the reader is reminded that the good people in London, in ancient times, executed an innocent person as a criminal, by public law, for the crime of using bituminous coal, upon the prejudicial idea, that such fuel was noxious or unwholesome, from its smell or odour. In such a fact, we have a strong and obvious instance of a change of public sentiment; for coal is now known to every one to be almost the only fuel used in London. Few people know the benefit which philosophy does in this world, in changing public sentiment, when wrong. Is there no way to lessen the reaction or difference of opinion, which exists in society among very different, but highly respectable characters, on the subject now under consideration? The ideas of very different brains are, to be sure, very oppositely associated on this delicate subject, owing to a great difference of education. It would be desirable to promote harmony between medical men and statesmen on this feeling subject, because a collision between powerful characters, may do much mischief to the rest of the community. But, too many find it for their interest to side with the ignorant; and society is often thus injured.

We are aware that ignorant persons suppose, that the dissection of a dead body blunts the sensibility and hardens the feelings of the anatomist, and thus injures him as a citizen ; and we admit, by way of illustration, that one has no right to destroy or greatly to injure his own person, inasmuch as he inflicts an evil upon others by so doing : but the surgeon's duty is different from that of other people.

That useless anatomical curiosity may not be sometimes too much indulged in, especially at the present time, when medical men are very zealous to improve their art, it would be presumptuous to deny, unless human judgment were perfect ; but public law cannot regulate so small and secret a business, if it is not done exactly right.

We are fully sensible that the study of anatomy, as well as that of religion and speculative freemasonry, may sometimes occasion hallucination or delusion, in the brain of a very zealous medical student ; and a state of hallucination in the brain of an anatomist may sometimes be made to appear like a state of horrid inhumanity, to the very differently associated brains of a court and jury ; and great injustice may thus be done. By way of illustration, it may be said, that the hallucinations or delusions of freemasons likewise appear wonderfully ridiculous, if not wicked, to the rest of mankind. In excuse for the fraternity of freemasons, it may be noticed, that it would be very strange if they or all of their members should be exempt from so common an infirmity of human nature, as that of hallucination or impassioned error.^(u)

(u) Those who are fond of poetry and humour will please to read an inimitable satire upon the hallucinated or impassioned brain of the anatomist, published many years ago in Philadelphia ; and supposed to be written by the Hon. Francis Hopkinson, Esq. L. L. D. Federal Judge of the District of Pennsylvania. It may be found in a volume of American Poems, published at Litchfield, (Conn.) many years since. Such poetry, and likewise the Hypocrite's Hope, published in the same volume, and written by Lemuel Hopkins, M. D. of Hartford, (Conn.) are better means to prevent hallucination, or an erroneous and too great an excitement of the thinking apparatus, than any public law.

It may be suggested, for the benefit of anatomy, whether dead bodies cannot sometimes be purchased directly from certain well disposed relatives or their substitutes, previous to, or after, inhumation, provided such relatives can be satisfied that great secrecy and decorum shall be observed. For illustration—we say that we once procured an anatomical subject in such a way, and without price, from a very respectable and pious person. It is believed such a plan has not often been thought of by anatomists.

We hope to be excused for proposing the subsequent plan. Suppose a surgeon should buy an uncertain privilege of a person, who should agree to remain ignorant of what the surgeon might do in relation to a particular dead body: painful feelings might thus be diminished. Among such a population as exists in London, where surgeons are said to pay the enormous price of eight guineas, or nearly forty dollars, for anatomical subjects, it is believed that dead bodies might often be thus procured, without even violating such a law as that of Connecticut.

Surgeons can sometimes ask as a favour of a living friend, the privilege of performing a single surgical operation, or partial dissection, for their own improvement. We ourselves have sometimes done so, and succeeded in our wishes, even before inhumation.

Surgeons may sometimes give by will their own bodies, or direct operations or partial dissections to be decently done, previous to inhumation, when they think the public can thus be benefitted, without too much injuring the feelings of their surviving friends. Brute subjects ought, in some cases, to be substituted for human ones.

When the human body is dissected before inhumation, which is sometimes done on account of expediency, great care should be taken to ascertain that the person is com-

Intelligent statesmen should likewise read an Essay by Wm. Mackenzie, on exhumation and dissection, published in the Westminster Review, (Eng.) in 1826. Some of the author's sentiments are, however, very erroneous.

pletely dead. Some skill is needed to do so. Otherwise a humane anatomist might do a real, although unintentional injury to the living.

A great anatomist was once, *in an ignorant age*, cruelly persecuted for having committed such a mistake as is now alluded to ; and, strange to tell ! to gratify a passion which should not be named in good society, his great and just fame had been once foolishly slandered in a common newspaper, on account of the same error, *even in this enlightened age*.

The danger under consideration furnishes a good reason in favour of exhumation. In illustration of this part of our subject, it may be mentioned that criminals, who have been hung by ignorant sheriffs, have been resuscitated after they had fallen into the hands of compassionate anatomists. It can hardly be needful to remind any one, in such a case, that the legal errors committed by sheriffs, sometimes give the anatomist the great pleasure of doing an humane act of the highest grade to an unfortunate individual who has been a criminal. These opportunities of gratifying benevolent feelings must be a sort of compensation to anatomists, for the cruel persecution which those truly benevolent characters have so often to encounter.

Why should not public law regulate the bloody and repulsive business of the butcher, as well as that of the anatomist, with a view to lessen the great pains or sufferings which may be unnecessarily inflicted upon vitality. No better reason can be given why this thing is not oftener done, than that statesmen understand the nature of the former business much better than they do that of the latter. Both of these kinds are needful for the prolongation of human life. They differ, however, in one respect, viz. : that of the butcher is every day useful to the many and the healthy, that of the anatomist to the few who may be sick and lame. But each individual belongs to the whole community, and is liable to become one of the sick and lame. This should not be forgotten by individuals, when they help to make oppressive laws against anatomists ; because such laws may operate against themselves or

their friends, and at a time when they have enough of other trouble.

Although the Connecticut Medical School has succeeded very well, considering the embarrassments which it has in common with other medical institutions, yet it might flourish still more, were it not for the prejudices existing among the very people who are most benefitted, especially in a pecuniary view of the case. Much of the money that is expended elsewhere, might circulate in New-Haven in preference to more expensive places. But we wish not to be too selfish in favour of New-Haven, or in favour of our own profession.

The medical profession has not hitherto been regarded as distinguished for real crimes or bad morals, but has very honourably been intrusted with the permission to legislate in a partial manner, by most civilized governments; and its laws and regulations regard the very highest interests of human beings, viz. their health and life.

As the lightning rod of Franklin lessens the terror of a natural tempest, so it is hoped that what has been written above may diminish the horror excited in the moral world by the needful business of the anatomist; and lessen that tendency to riots and legal persecution, when, by some unforeseen accident, anatomists are discovered to be engaged in the performance of their repulsive duties. One would think that anatomists experience their full share of trouble, from the nature of their business, without that which arises from the ignorance of the community with respect to anatomy.

Mankind dislike an individual, unless he conforms to a public fashion, and to a public law. The latter he must obey, even if it be unjust; but a man may publish his sentiments respecting a law, with a view to its improvement."

VESALIUS.

The following is a fragment to a series of Essays which have been written, on Exhumation and Dissection, and partially published.

There is a weighty objection, in this country, to designating any other class of citizens than criminals, for anatomical purposes, by any public law. Such a measure would render very unhappy many innocent persons, previous to their death, who might never be used by the anatomists when dead; thus an unnecessary evil would be created. A general law which may tolerate secrecy in an act so useful to all concerned, as that of exhumation; and, with a view not to disturb human feelings, is what is decidedly contended for by us. Intelligent persons would not often be injured by such a lenient law, and it is impossible for government to accommodate the ignorant in all cases; neither can every kind of trespass be prevented. Besides, such a law, as is now contemplated, would not, like a recent one made in Connecticut, in respect to exhumation, violate a fundamental moral principle in relation to felony. *Public bodies ought to act upon correct principles, as well as individuals.*

Self-murderers, where there are no friends, might perhaps be included, in the list of persons above referred to. That crime might be rendered less frequent by such a measure.

Idiots, foundlings, still-born infants, vile prostitutes, and other useless characters, where there are no respectable friends, as well as criminals, have been used by anatomists for dissection. It might be difficult and cruel to designate all of them, while alive, to be used, when dead: for such an important public purpose, by a general law. Intelligent and honest anatomists are as capable of selecting after death, suitable human bodies for dissection, as any other class of people; and they might be associated with other intelligent characters in the performance of this unpleasant duty. We ourselves, however, do not think, that the public good requires that surgeons shall be thus encumbered. It would be more dif-

difficult to maintain secret decorum, if such was the case. Anatomists are neither vile nor dangerous characters; and do not need to be thus watched. In making choice of anatomical subjects, reference is had to surviving friends, for, as respects the dead, it is a matter of no moment.—Respectable persons, in general, have more friends, than vile or useless ones. Hence the latter characters may generally be more suitable for the anatomist than the former, because, in case of detection, less public disturbance is occasioned. We hope surgeons may not be long driven, by the continuance of our cruel laws, to employ and trust to the discretion of irresponsible resurrectionists, with a view to evade the law. Community in this country ought to learn from the errors committed at home and abroad, how to make laws in relation to anatomy. While writing this fragment, we have learned that a law is recently made in G. Britain, selling or giving the dead bodies of the innocent and harmless poor, in certain cases, to the surgeons, for the benefit of the public—We are rather surprised at this. The sum total of mischief done to human feelings, will probably be an hundredfold greater, by such a law, than would result from legally encouraging secret disinterment by decent and wise means; at least so great, if not more, would be the difference, in our opinion, in the free parts of this country. Besides, a public act in favour of, or tolerating, in certain circumstances, decent exhumation, would do equal justice to all classes of citizens, including medical men among the rest, which cannot be said of the law just passed in Great Britain.^(v) A similar plan to that which has succeeded in England, recently failed, before the Hon. Legislature of Massachusetts—and we need hardly say, justly, in our opinion.

We suspect the plan of tolerating or enforcing secret decorum, by law, has not occurred to statesmen. We hope to induce them to think seriously on this new scheme. It is

^(v) After receiving the proof sheets of the above, we learn with pleasure, that the act mentioned, though it passed the House of Commons, was rejected in the House of Lords, in G. Britain.

thought that medical men can manage the business of anatomy with suitable discretion, if the Government will protect them. If the knowledge of anatomy is useful, it ought to be protected, and even encouraged. It is a known fact, that the science of anatomy is not attended to, in this state, as much as it ought to be, on account of the many difficulties to be surmounted. No law is needed, on this subject, on account of vile characters. These have no motives to touch the dead, independent of anatomists. Other kinds of knowledge, *except that which is medical*, meet with patronage.

VESALIUS.

AN ACT

To prevent the disinterment of the bodies of deceased persons.

(FROM THE STATUTE LAWS OF THE STATE OF CONNECTICUT.)

SECT. I. BE it enacted by the Senate and House of Representatives in General Assembly convened, That if any person or persons shall open the grave of any deceased person, or the tomb where the body or bodies of any deceased person or persons have been deposited, or shall remove the body or bodies or remains of any deceased person or persons from their grave, graves, or place of sepulture, for the purpose of dissection, or any surgical or anatomical experiments, or for any other purpose, without the consent of the near relations of the deceased; or shall in any way aid, assist, or procure the same to be done; or shall receive, conceal or secrete, any such body or bodies, or shall aid or assist in any surgical or anatomical experiments, or demonstrations therewith, or dissections thereof, knowing said body or bodies to have been so taken or removed from the place or places of their sepulture; every such person so offending shall forfeit and pay a fine not exceeding two thousand dollars, nor less than two hundred dollars, and shall be further punished by imprison-

ment in Newgate prison, for a term not exceeding ten years, nor less than one year, at the discretion of the court having cognizance thereof.

SECT. 2. That no professor, teacher, or lecturer in any college, academy, school, or medical institution shall perform any anatomical or surgical experiments, on the body of any deceased person whatever in any building in which students of such college, academy, school or medical institution, are taught, or instructed in medical science, until such professor, teacher or lecturer shall have first given bond with sufficient surety to the treasurer of this state, in the sum of one thousand dollars, conditioned, that no body of any deceased person which shall have been disintered or procured contrary to the provisions of this act, shall be introduced or brought within such building, during the time that he holds the office, or exercises the duties of professor, teacher, or lecturer as aforesaid in such college, academy, school, or medical institution, or elsewhere in this state. And if any such professor, teacher, or lecturer, or any other person, shall perform any anatomical or surgical experiments on the body of any deceased person, in any such building, without said professor, teacher or lecturer having first given bond as aforesaid, he, the said professor, teacher or lecturer shall, being duly convicted before the superior court, forfeit and pay to the treasurer of this state, a fine not exceeding two thousand dollars, nor less than five hundred dollars, at the discretion of the court having cognizance of the offence.

SECT. 3. That the mayor and two senior aldermen of any city, and the select-men of any town, in which such college, academy, school, or medical institution may be located, shall have authority at all times to enter and inspect every part of such building.

SECT. 4. That the bodies of criminals, who shall be confined in Newgate prison for crimes hereafter committed, and shall die in said prison, who have no known relations, shall, with the approbation of the overseers of said prison, be at the disposal of the professors of anatomy and surgery in the medical institution in this state, to be used for the purpose of

advancing medical science, and shall at all times be subject to their order; and also the bodies of persons capitally punished under sentence of the law, at the discretion of the court, before whom the conviction of such persons takes place.

SECT. 5. That in all cases of the breach of the first section of this act, it shall be the duty of the governor or the person exercising the office of Governor, upon application of the select-men of the town where such offence shall have been committed, to offer a reward not exceeding the sum of two hundred dollars, for the apprehension of any person or persons who shall have been guilty as aforesaid, and in case of the apprehension and conviction of such offender or offenders, the comptroller of public accounts, upon the application of the Governor, or the person exercising the office of Governor, shall draw an order on the treasury for the amount of the reward thus offered, who shall pay the same.

The surgical and anatomical professors in Yale College, were unreasonably compelled, by the law complained of in the former numbers, to submit their daily conduct in the anatomical theatre to the public authority, unless they might choose to relinquish a profitable business; and likewise to give a heavy bond to the government, that they would not violate a statute made for them and others. Justice would seem to require, that other people should give bonds, as well as those gentlemen, not to violate a penal law. This tyranny reminds one of the oppressed Israelites, who were unjustly required by Pharaoh to make bricks without straw. For how can one perform the duties of teaching anatomy without the means? And such means cannot always be imported, on account of the very great difficulty in the case.

Perhaps the incumbent professors, upon a principle of good citizenship, were excusable for a submission to an unjust penal statute, made by impassioned and ignorant persons.

The minds alluded to were undoubtedly ignorant on the subject of anatomy, and likewise highly impassioned, if we have been correctly informed. No offence is intended by the above expressions. It is expedient, in our opinion, to record such facts, to prevent similar errors in future. The use of skeletons was once forbidden in Russia, as being subservient to witchcraft!!! It may be said in excuse for those characters now alluded to, that mankind are passionate beings, and that they are necessarily ignorant in anatomy, and cannot be governed by cool reason. Admit this to be so, should not those who make laws, and likewise those who execute them, inform themselves on the subject of anatomy; and likewise be governed by cool reason, so far as may be practicable?

There is an honour, or sympathetic compassion, due to the incumbent professors in the Medical-College, for patiently sustaining the indignity put upon their feelings by the Hon. Legislature of Connecticut, which would not be due to one who from mean self-interest merely, should voluntarily submit to so unjust a law. Well might a respectable correlative professor say, in an eulogium on the late truly eminent Dr. Nathan Smith, that he was submissive to the laws. It may well, however, be made a question, whether the Doctor would not have done more good, if he had possessed less humility in regard to the oppressive law under consideration. Dr. Hosack of New-York, and his spirited and honourable correlatives, would have done differently in such a case. Another gentleman of high feelings may not be willing to accept of Dr. Smith's vacant office. Such acceptance would be buying public promotion at too dear a rate, in the estimation of many persons. By the by, the office is vacant while we are now writing. Even the most humble citizens, whose feelings of honour are less acute, have a right secured to them by the highest of all laws, the *Constitution* of the State, to occupy their own houses or buildings in such a way as they may choose, without being annoyed by daily or hourly visits from the public authority, to see whether they may

not be doing mischief? Whether giving the public authority access to a secret *dissecting room*, without a reasonable and legal process, is a violation of the Constitution of the State, is left to the inquiry of intelligent lawyers.

2. Suppose there are twelve thousand medical men in these United States; suppose likewise that each of these persons has under his watchful medical care five hundred persons, including his own children, himself, and particular friends, to say nothing of the rest of society; then we have sixty hundred thousand persons, who have a known and direct interest of the *highest grade* in the science of anatomy. Is it reasonable, that these persons to whom allusion is now had, should be seriously injured by laws made by a very few statesmen, who are entirely ignorant of the science of anatomy, and of its benefits?—and because, by so doing, they can gratify the propensities of the ignorant. We maintain that the propensities of mankind should be controuled when they do mischief to themselves. We fear that few statesmen, who depend on popular election for their places, have nerve strong enough to do their duty in some such cases. We can, however, inform such statesmen, that medical men ought not, and will not, patiently submit to such unjust laws as are now in existence in respect to anatomy.

It is a curious fact, that the higher orders in society should make laws respecting exhumation, highly injurious to themselves, merely to protect the dead bodies of the vile part of the community; which bodies are incapable of receiving injury. Such part of society are not equally well protected while living.

Public sentiment has been changed, within thirty years, in relation to vaccination, and, we believe, with suitable pains, it can be altered, with regard to exhumation and dissection, and the public highly benefitted thereby. Wise persons have long been aware, that the modern fashion of inhumation was far better than the ancient one of burning the dead. Because, notwithstanding our *persecuting* laws, it facilitates the study of the science of anatomy, which is so important to the sick and lame; and in mental philosophy.

3. When the late statute in Connecticut, is compared with the old one, on anatomy, which old one is likewise defective, it evidently shows a deterioration in wisdom, among the people, respecting what is best for themselves. The people make their own laws in Connecticut. When an improvement is attempted, if it is not accomplished, it demonstrates want of intelligence in relation thereto. The people, taken collectively, are not always competent to do what is best for themselves, the fashionable sentiment to the contrary, notwithstanding. It is hoped that, in future, no people will employ empirics, or persons ignorant of the business alluded to, to make laws for them concerning it. The reader must now be convinced that such characters must be less competent to do such a delicate and difficult business, than intelligent and honest surgeons would be. The humane, although seemingly cruel hand of surgery, certainly ought not to be thus palsied!!—The Hon. Legislature of Massachusetts recently undertook to do something in relation to anatomy. They however failed to do the business right, *for want of knowledge*. If we ourselves should likewise fail, in our main object, viz. that of showing to the conviction of intelligent persons, how this very difficult business should be done, we shall have the consolation of having failed in our object in highly respectable company. The fact is, there is so much intelligence of a particular sort, and nice discrimination needed in the management of medical affairs, and human health, in the best possible manner, that mankind, even in an highly intelligent state of society, make innumerable blunders, when they undertake to conduct such business without the advice and aid of the most intelligent medical men.

Those who highly estimate human health and comfort, should be aware of such a fact; as to others, it is a matter of less moment. The importance of human health in the estimation of mankind, is, however, what gives the medical profession its importance. The above remarks are made, partly to prevent legislatures from interfering with anatomy and surgery, *without first seeking professional advice*.

Laws, without doubt, ought to be made to encourage in-

stead of discouraging the science of anatomy, if such science is highly useful to the whole community. And of this there can be no doubt. *This utility, however, unfortunately is not obvious to the uninformed ; hence difficulty arises.* Human dissection is so opposed to the common propensities of mankind, that without such aid, as is now alluded to, there is great reason to fear, that the business will not, in general, be sufficiently attended to, except by those who have become impassioned in the employment. Indeed, such is known to be the fact. Other kinds of difficult business, if useful, receive legal patronage, and why not this ? But if the people, on the whole, for they make the laws, should prefer ignorant medical men to the evils of exhumation, they will abolish all the medical institutions in our country, which they have hitherto established, for they are the nurseries, of this disgusting, although useful business. In that case, however, another evil would arise, viz. the most enterprising medical students would then expend the people's money in foreign countries, in pursuit of anatomical knowledge. If the community should do so, we would advise them, with respectful submission, to go still further in the over-nice and fashionable progress in improvement, namely, we would advise that laws be made to abolish disagreeable surgical operations ; they ought to be prohibited, unless they can be performed with reasonable safety to patients. Such a strong mode of stating things may open the eyes of some, who are blind, from prejudice on this subject. Attempts at improvements, however, ought not to be discouraged, for they are needed enough.

Our readers may say, that we have viewed only one side of our subject, and that the public are in no danger of wanting a sufficient number of skilful surgeons. Admit that a proper number of enterprising and benevolent men can be found, who may be willing to surmount every difficulty which can be thrown in their way, does this prove that there is no such thing as right and wrong on the part of the public ? Besides, such critics should be reminded that it is a known fact, that the great and disagreeable mental efforts, so repeatedly made by such men as are now in contemplation, often very much

shorten their highly valuable lives ; and thus the public is injured. It remains to be ascertained, whether a court and jury can be found, who may be willing to execute so cruel a law, as the one under consideration. We have happened to know of several persons, who were as innocent of the crime of *real felony*, as a child unborn, who have been caught in the meshes of the cruel laws of this country, in relation to anatomy. The last of these, after lying in a county jail many cold winter nights, was, by the powerful aid of highly respectable friends, with much difficulty and great expence, at last saved from suffering the penalties of the state prison for ten years, as the case might have been. This person wisely concluded, if such were some of the evils of the mysterious, or secret art of surgery, to quit the business ; and the next we heard of him, he was calculating to become a seafaring man. No doubt much other such suffering, among the living, although the dead are well enough off, might be found by making suitable inquiries. Besides much trouble and expence are needed to get rid of the evil of such barbarous laws, as have descended to us in relation to anatomy.

Those correlatives of the late Governor, who may think that we bear rather hard upon his favourite law, are informed that we have no personal acquaintance with any one who voted for that law ; of course, we cannot reasonably be supposed to have any unfriendly feelings of a personal nature, in relation thereto. Cannot some of those characters to whom we now allude, be induced to re-consider their vote ? or is this expecting too much from human nature ? or must we wait still longer for other characters to come into office ? Those, who may be willing to read Dr. Makenzie's Essay already alluded to, and inform themselves otherwise, may become satisfied that anatomists are as well acquainted with the propensities of mankind respecting their dead friends, as other people, and that such characters, in general, have no wish to disturb the peace of society by their vocation.

If the reader is not already too much exhausted, he will attend to the subsequent remarks, as having some connection

with our subject. It is very easy to prove, in relation to Connecticut, that the first class of medical men are too much oppressed either for their own good or that of the public. This is owing to our laws, customs, and fashions. The State, however, is peculiarly fortunate, as respects climate, in regard to health. The evil now referred to, was strongly felt many years ago, and a remedy was sought, in the incorporation of a medical society. Owing, however, to the succumbing feature or shape, or to some other defect in its organization, which that institution has assumed, there is too much reason to apprehend that such characters as contemplated, are sunk deeper in the mire. The government of the State, when medical men were incorporated, had good reason to expect that such characters would seek resources, to benefit themselves as well as the community. They have, however, been so generous, or unwise, as to injure both themselves and the community.

We are aware that some may regard the preceding as the querulousness of age. We think, notwithstanding, that we are right ; for such has been our opinion for many years. It has been noticed, likewise, that high medical characters have devoted little attention to the concerns of the society. Indeed, no description of characters have thought it worthy of very zealous attention ;—not wishing to give offence, but to record a known truth ;—and such high characters, doubtless, can be more usefully employed. Every one must have noticed that the most honest and intelligent physicians do not generally encourage those, who would do the most honour to their own profession, to enter into it. We allude to the sons of such medical practitioners.

The remedy for the evils now contemplated, is apprehended to exist partly in the whole community, and not entirely among medical men ; if so, a medical society should teach the community what should be done. In illustration of our opinions it may be said, if one may be permitted to compare animals with men, that good horses are more useful than inferior ones, and they are, accordingly, preferred by mankind ; for there is no envy in this case.

The best men are often neglected on account of that passion; and because inferior ones gain an advantage by it. It is easy to perceive how too much equalizing policy may injure a whole community. In those townships in Connecticut, where there are the most demagogues,—for these characters, like quacks, do little good,—the whole community are the worst off; or, at least, rank less high in the scale of society. Each young man may decide for himself where he will reside. Some may choose a lower, and others a higher, station in relation to life. Some may think our illustrations have no relation to our subject. Such are reminded that eminent medical characters are necessarily elevated above many in a community. Too many, in an equalizing community, suppose that the principle of equality requires almost starvation, or at least too much poverty, for the condition of such persons. Such demagogues do not know or consider the many difficulties which such medical men have to surmount. Physicians are, however, partly to blame for having multiplied their number too fast by their fostering regulations. This is one principal evil, which has originated *from our medical society*. Physicians, if too numerous, are more liable than many other characters to be too officious, for all concerned. They resemble the more amiable sex in this respect. Too great a number in the market occasions wanton conduct among that sex. Like causes sometimes produce similar effects, although the sexes may be different.

The plan of making a medical institution succumb to a mere literary, moral, or religious one, is, *at least, unphilosophical*, if not unwise. That boys of a certain age should be taught and governed by suitable authority, no one doubts. Why medical men, even if they be only young gentlemen, should be controuled by such authority, in preference to any other, is not obvious. There may be a convenience in having literary institutions in one neighbourhood; but why a superior one should, in justice, be governed or incumbered by an inferior one, is a different question. Others, in new settlements, may learn wisdom from our errors. Is it not a favourable time, in this country, for the medical profession, as

a body, to assert their rights, and to maintain them with firmness?

If, thirty years ago, the medical society had been formed in the best possible manner, and if its members had possessed intelligence, decision, and energy enough, that society might now have had a medical school or college of its own, and abundant means of learning the healing art. *Such a noble institution as we now contemplate, by being made a promulgating point for medical science, and likewise for the important knowledge of vitality in general, might have done wonders in this small, very convenient, and intelligent State.* If such had been the case, the associations of intelligent men in general would have been such, as to have prevented the cruel law complained of. The public sentiment is an artificial thing, and, like other artificial things, can be altered; and we predict that it will be modified in relation to exhumation and anatomy, and likewise in regard to human vitality and education. The latter should be controuled by true philosophy or cool reason. The best public good requires an alteration, in many respects, among some men of science. Such moral innovations, however, should be made gradually to prevent excitement.

Decided qualities and perseverance, in a few harmonious men, properly directed, can, in a few years, accomplish great and useful things. This we see in every age exemplified by the acts of hallucinated and impassioned minds, even when those minds are naturally less judicious than those on whom such characters operate. United efforts overcome or govern individual minds, however powerful those minds may be.

Decided and persevering qualities and harmony were unfortunately wanting in the early members of the Connecticut Medical Society; and because funds and influence were wanting, they sold themselves to another institution, viz. Yale College; which institution was, however, in many respects, a very respectable one. Some good has resulted from such an act, but much more might have been done in modifying the public sentiment, by a different management,

We wish not to injure the feelings of those respectable characters who may be alive, to whose acts allusion has been had, any more than the necessity of the case requires. We take some credit to ourselves for having foreseen, about twenty-five years ago, some of the evils the medical profession are now experiencing in this State. If the powerful Yale College interest, as an unit, or its authority, would address the people, or otherwise act efficiently, even at this late period, in favour of removing the deadly blow struck at the very foundation of correct medical science, by the Hon. Legislature of the State, it might operate against the unfavourable opinion of many, as well as ourselves, in relation to the union of the Medical Society with that institution. Contemplating, as a philosopher, the powerful, and sometimes durable influence of what we consider wrong associations, induces us, however, almost to despair of living long enough to see such a desirable act as is now alluded to. We hope, however, partially to succeed, even in this object of ours.

The reader is reminded, that other political affairs, than those of which we treat, are often injudiciously conducted. These are, however, of less importance than the health of the community; of course, they will receive no notice from us. A plenty of the means of subsistence and good morals are, however, so intimately connected with the public health, that they may, perhaps, be regarded as of equal importance, or nearly so. Judging from the lowness of medical fees in Connecticut, one would suppose that property, regarded as a means of health, was held by the community in higher estimation than health itself. Fees are rated high enough, however, for those who increase their quantum of business by want of medical skill; which is, unfortunately for the sick, too often the case. Avarice, so common among mankind, and the injudicious use of property for less important, and often very distant objects, occasion this mistake. It is hoped that no offence will be taken by the community; for a whole people, like individuals, may injure themselves. It is needful to ascertain a fault, to cure it; and medical men should gently and wisely apply the remedy; yet, without

self-meanness, when practicable. It is often, however, impracticable; because much of the disagreeable and highly responsible labour of the physician, like that of the honest lawyer, is unperceivable to the employer. So is, likewise, its beneficial effects, at least to the uninformed. The reader is requested not to apply the above remarks respecting medical fees to the condition of the writer. He has happened to know several eminent physicians, who, in their old age, were dependent upon their children or charity for support; and he knows too many, in the prime of life, who have not the means to procure books, &c., needed to do justice to the public.

He thinks that some of our readers may say, really, Mr. Author, you have worked up your own heated imagination so far in these essays, as to make yourself believe, that the performance of a few surgical operations, in an elegant safe manner, is a matter of immense moment among other highly important concerns of society!! In excuse, it may be said, if such an objection be well founded, that legislative bodies are equally in an error, when they make statute laws concerning anatomy and surgery, or human health. Suppose we have a riot, once in a great while, what then? Why every evil cannot be prevented by public law. Besides, is not society fairly entitled to enjoy the convenience or luxury of a sufficient number of good surgeons, or an able medical profession? We are aware that some think, we have too many luxuries. To this position we agree, if they are misused. The study of anatomy, and human dissection, particularly that of the human brain, or the science of Phrenology and Physiognomy, are useful in the other sciences, as well as that of medicine. The unpleasant state of doubtfulness in mental philosophy and mysticism, may thus be easily cured.

Before we take our friendly leave of the reader, there is a wish to be indulged in the subsequent remarks. There is now such a *host* of intelligent men, even in this country, which was formerly not the case, as well as in other countries, who will give their testimony to the uninformed, in favour of human dissection, and likewise in favour of occasional and decent disinter-

ment of the human body, if necessary, that it would seem that the prejudices of the latter, when cool, i. e. the uninformed, might be made gradually to yield to the convincing force of such evidence. This induces one to hope that what is written in the preceding essays, will not give offence to any class of citizens, nor be done in vain, like much that is written. We hope also that physicians will not be driven by injudicious measures, to form societies among other classes of citizens, to effect their object, or to train up, or educate a set of resurrection men, as has been done in England.

If, in this, and in the former communications, we have indiscreetly too much indulged, during the heat of composition, our own private feelings, it will show at least, that a medical man is capable of feeling injuries, when done to his fraternity and to the community, even if those injuries be unintentional ones. Besides, such conduct may be only following the example of one Hon. Legislature, if we be rightly informed, and many others, in the community; on a different side of the question to be sure.

It has long been the opinion among anatomists, that neither their own good, nor that of the public required, that the secret mode of dissecting the human body should be made public, not even in an abstract manner. Such men thought it too small and delicate an affair to trouble the whole public with; and this opinion may have been correct. There has now, however, been so much divulged in relation to this business, and so much unreasonable excitement got up respecting it, both in this country and in Great Britain, that a different mode of proceeding in our opinion is expedient. Honourable men ought, in justice to themselves, to repel, and with spirit and perseverance, the odious slander with which their profession is continually assailed; and that too from the highest authorities existing, both in this country, and in the British dominions. For such authorities treat physicians and surgeons as if they were eminently liable to felony. It is not, however, so on the continent of Europe, where there is, however, a shade of difference in human vitality; for Frenchmen are made of more flexible, or yielding materials, than

Englishmen. Of course it is more easy for anatomists to alter or modify public sentiment in that country, than in England. This last fact alluded to shews the mutability of public sentiment, and should encourage medical men, especially the timid, to do ample justice to themselves, as well as to the public.

It methinks we hear some cool, selfish, calculating, or obtuse philosophers, notwithstanding all that has been so feelingly written, say, with some degree of contempt, we know as well as you, Mr. Author, that the public sentiment is a fickle thing; and that human vitality varies in different countries. But we likewise know, as you must, that it costs much labour and trouble to effect a change in so great a body, as that of the public; especially if they be a stubborn people; and we choose not to tax ourselves thus, so long as we can effect our own anatomical purposes by committing a few slight, if not harmless trespasses upon the living, by disinterring the dead, which may never be found out. Those trespasses alluded to, are at any rate slight, as viewed by true philosophers, who are the wisest part of mankind. Suppose so large and respectable a profession, as that of medicine, have a stigma fixed upon them by this conduct, the profession is well able, and may be very willing, as we have good silent reasons for believing, to bear the stigma; for the profession is benefitted, as well as the public, by the conduct of anatomists. If such conduct is disapproved of by the medical profession, they may take measures to remedy the evil, which as a body they might very easily do, by a very simple united act, or vote.

In respect to post mortem examinations, in private medical practice, judging from our own observations, we should say, that mankind may be divided into two classes.

1. The over-selfish; 2. The generous. The latter seldom obstinately refuse to have such examinations made, upon their dead relatives, when requested by their medical friends. Although we have maintained, on the one hand, that the plan of private decorum in anatomy, which has been pursued for a century, is the proper one, yet, on the other hand, we think the

secret, in the abstract, has been kept from the *general intelligent public* too long, for the best good of all concerned.

No one can accuse us of writing with a view to much profit, or popular fame, on a subject so undesirable, as to have been hitherto almost totally neglected. If we fail to induce statesmen to modify their laws, we shall yet lessen the horror excited by the surgeon's business.

The medical profession, in this country, and in Great Britain, are so unphilosophically opposed by public sentiment, although not by public law, that few men dare publish inductive truth, especially as regards anatomy or mental philosophy, for the benefit of the medical profession, or that of the public. It is not so in France. What avails the guaranteed liberty of the press, if it cannot be exercised without suffering abuse ?

No. 1. of these Essays was first published in the *Canal of Intelligence*, published in Norwich, (Con.) Jan. 21, 1829, Editor, Levi Huntington Young, Esq. ; and soon afterwards in a Newspaper, published in New Haven.

No. 2. was first published by J. B. Clapp and Co. in the *State Palladium*, in New London, (Con.) May 12, 1829.

No. 3. This number has been once published in the *New London Gazette*, edited by Col. Green, Aug. 26, 1829 ; and in the next paper a merry writer, in opposition, appeared over the signature of Haller. This writer was replied to, and the cause of anatomy doubtless benefitted, by the merriment occasioned. We do not think it needful to preserve those last hasty productions, written upon the spur of an occasion. The remainder has never been published.

CHAP. VIII.

AN HISTORY OF VACCINATION,

*As it was conducted in Goshen, Litchfield County,
(Conn.) in the commencement of that busi-
ness in the United States.*

SECTION I.

VACCINATION was first introduced into Goshen by the Author of this Work, in the winter of 1800, 1801. It was immediately carried on extensively, considering the novel nature of the business, by myself, and by another physician, the late Jesse Carington, M. D. He was my rival in business. A few others in that region also paid some attention to it. A few weeks only before vaccination was begun in Goshen, Dr. Waterhouse of Boston had received vaccine matter from England. I took my first vaccine fluid warm and fresh from a person in New Haven, who was visited for such a purpose. The distance was nearly fifty miles. This patient had been vaccinated six or seven days before. There was a complete failure very soon afterwards, in the business of vaccination in New Haven. As soon as I arrived home, I vaccinated three patients, two of whom were children. The children went through the regular process of

vaccination ; but the vaccine virus failed to infect the adult. Those children were immediately put to the usual test of variolous inoculation. The variolous infection occasioned very small effects, which soon disappeared. I was undoubtedly more indebted to chance than to skill for my good fortune in those experiments ; for, as was afterwards learned, nothing was known on this side the Atlantic, with regard to the proper time for taking vaccine virus. Dr. Waterhouse had not then so necessary a part of knowledge. Neither was it known that there was a spurious form of the disease. Information that there was a prophylactic for the small pox had come to us ; but books teaching how to manage said prophylactic were not then to be obtained in this country.

The general opinion was, that our physicians had nothing more to do than to obtain vaccine matter, use it upon a few persons, and then put them to the test of variolous inoculation, in order to convince the public of its utility, and afterwards to propagate the kine pock at pleasure.

Much good was expected to be done by the kine pock. Some money and fame was anticipated, and very little opposition was expected. A sad disappointment, however, ensued. While the good fortune, with vaccine virus, which has been mentioned, was an attendant upon my practice, the late Dr. Carrington was experiencing a sad evil from a similar cause. The Doctor had procured some vaccine infection from a travelling person, with which he vaccinated his wife and others. After she had got through with what her husband supposed was the kine pock, he persuaded her to have variolous infection put into her arm. The unfortunate and believing wife was easily made to understand the object in view, namely, to convince an incredulous public of the utility of the new practice ; but what must have been the disappointment and chagrin of the Doctor and his wife, occasioned by ridicule, and by my superior good fortune, when it was discovered that Mrs. Carrington was truly about to have the genuine small pox. Besides, it was easy for the Doctor to foresee that he must be at consider-

able expense to carry his wife through that loathsome and dangerous disease ; for it would be needful to remove her to a small pox Hospital in Cornwall, ten miles, for such a purpose. The small pox business in Connecticut is regulated by a public law ; the anticipated disaster, however, happened.

That calamity, and the two experiments which I had previously made, were very beneficial to all within their knowledge. Indeed, when it is considered that these experiments were some of the very first of the kind which had ever been made in the United States, if not in this hemisphere, they may be regarded as of peculiar importance. In justice, however, to Dr. Waterhouse, it should be said, that he had put six of his own children to the test of small pox a short time before.

Those experiments, now alluded to, cooled the ardour of all concerned, and seasonably taught the useful lesson, that we had to learn, *de novo*, or by dint of experiment, to distinguish the spurious from the genuine effects of the vaccine virus. Other experience soon taught us, that spurious kine pock was very liable to originate from that which was true. That knowledge being obtained, it was easy to perceive that there were difficulties to be overcome ; for, not only genuine vaccine virus was needed to begin our operations with, but knowledge was wanted to keep the virus in a genuine state, or to insure its genuine effects upon a succession of patients. To obtain such knowledge was found, upon trial, much more perplexing than was at first anticipated. A vast number of experiments were made by myself, Dr. Carrington, and others. These experiments were made with genuine vaccine lymph ; also with such as proved to be spurious ; likewise with variolous infection ; for we continued to try that infection occasionally as a test, notwithstanding the above disaster, upon such persons as were confidently believed to have passed the process of true vaccination. No other evil of the kind above noticed, however, afterwards occurred. At length, with great attention and experience, the skill

needed to discriminate the true from the spurious kine pock, was acquired.

But we had not yet learned to use vaccine infection so as, with certainty, to occasion the effect wanted. During the winter many persons had been vaccinated half a dozen times, before the desired effect could be produced. Much trouble and vexation arose from that source; *much greater than in future will probably ever again occur.*

No one was so fortunate as to discover that golden rule in vaccination, which may be communicated in a few words when once learned. So great is the difficulty in discovering experimental truth;—*much greater than many people apprehend.* Great advantage is derived from having many persons to work in a field of science, especially when each is willing to communicate to the whole.

Hoping to gain some advantage thereby, I wrote in the following spring to Dr. Waterhouse, stating some of the difficulties in our region, attendant on vaccination. In his answer, the Doctor said he had experienced similar perplexity. But he wrote that he, a few days before, had received in a letter from Dr. Jenner the following as a golden rule, in vaccination, viz. "*Take the fluid for vaccination on or before the expiration of the eighth day.*" Every tyro in the medical profession now knows that rule; but none can realize its value but those who have experienced the evils occasioned by the want of such information. To the above there should, in my decided opinion, be added another rule, which is not generally known, or attended to; at least the proposed rule is not taught in medical books.

Form patients into classes or companies. Such classes may be larger or smaller as may be convenient. Then, when one in a given class is made to have the vaccine pustule, take virus from said pustule, according to the above golden rule, and vaccinate the remainder of said class, with such virus, while warm and fresh from such a pustule.

The vaccine fluid thus used seldom fails to do its duty. I have managed the kine pock business, whenever I have at-

tended to it, upon the plan now recommended, for thirty years past. The people should be taught to submit to such a management; and it is in the power of the profession thus to teach them, *provided medical men can agree to do so.* Much trouble, both to physicians and patients, is prevented by such a management.

When there was trouble and perplexity enough, occasioned by our ignorance respecting the kine pock, we had to encounter a host of other vexations, occasioned by the prejudices of those around, both in and out of our profession. I have not myself forgotten, nor am I likely to forget, those tormenting vexations, although they occurred thirty years since.

The kine pock pedler; for by no better name ought such a person to be called who sold his matter to Dr. Carrington, had been much too successful, for the honour of our profession, in duping even medical men by his quackery. He had been the means of extending the spurious vaccine malady very extensively in New-England. The physicians who bought, and used his matter, were sadly disappointed and chagrined whenever they subjected their patients to the test of the small pox. This cause, and the very natural prejudices of the people, and the nescience of their physicians, aided by the uncandid and mischievous part of society, occasioned a great and unreasonable excitement, against the introduction and adoption of the vaccine blessing. The physicians throughout New-England became discouraged, and relinquished their efforts to extend such a benefit.

In the spring of the year 1801 there was no genuine vaccine matter this side the Atlantic, except in Goshen, and in the hands of Dr. Waterhouse or others in his vicinity. During the winter of 1800, 1801, there was a complete failure, in the cities of New-York and in Philadelphia, in obtaining *genuine* vaccine virus. This circumstance enabled me to introduce the kine pock, for the first time, into the city of New-York. This was done in May 1801, by the agency of a Mr. Hunt. Mr. Hunt visited New-York, on his own business, while he had the kine pock in his arm, and that too in the right stage for

taking matter. Mr. Hunt, at my request, called on the late Dr. Edward Miller, who vaccinated others from his arm. I vaccinated Mr. Hunt from the arm of a little girl. This girl was vaccinated by virus taken in a fluid state from the hand of a Mr. Ives. Mr. Ives had taken the *cow pox* directly from a cow, by milking. The story of said Ives is told, in a note, in my treatise on the Spotted Fever. The reader will now perceive, that the first genuine kine pock, that was ever introduced into the city of New-York, originated from an *American source*. Mr. Hunt procured for me Mr. Aikin's treatise on the cow pox. Could I have had that book half a year sooner, it would have saved me an immensity of trouble. Had we in Goshen, and Dr. Waterhouse, and perhaps others in that region, succumbed, as others did, to the embarrassments attendant upon vaccination, during the first season of managing that business, it would probably have retarded the introduction of so great a blessing into New-England, for a considerable time, *even for years as the case might have been*. We undoubtedly did our duty at that season. Dr. Fancher and others had not then become famous in that line of practice.

It may appear hardly credible to a reader of the present day, that the facts, now to be detailed, should have occurred. The people in Goshen, and in its vicinity, notwithstanding the demonstrative evidence, which had been brought to their own doors, would believe the mischievous reports, which they were constantly hearing from abroad, respecting the insecurity of vaccination. There are too many people, in common society, who know no difference between demonstrative evidence and mischievous reports.

The excitement or opposition ran so high, and was so very unreasonable, that to get rid of the convincing evidence, occasioned by the multitude of experiments which had been made, I was myself, in particular, actually accused of using on design bad small pox matter; for I was then in the habit of using variolous infection, as a *test*, upon such of my patients as chose thus to be tried. I acted upon the opinion that no

law of the state was violated, unless I actually communicated the genuine small pox.

To silence such slander, I begged as a favour that five of my vaccinated patients would visit, with me, a small pox Hospital, at Winchester, eight miles distant, and there be inoculated with warm variolous infection, and likewise see the small pox for themselves; for some, among other objections, maintained that the kine pock was a worse malady than the small pox. This last experiment was actually tried and succeeded, and it was acknowledged to be a fair one.

Another trouble arose in the progress of this business. After we had succeeded, with much labour and expense, in establishing the utility of vaccination, too many thought, that they could vaccinate themselves after they had learnt how from us; and such persons doubtless thought it was perfectly a fair game to defraud their teachers of the pitiful fees, which were expected. I was also in trouble with some of my own profession. The ardour of the whole profession was, at first, much too great. Much money was expected to be made, as well as fame, acquired by vaccination. It was soon perfectly easy for me to perceive, that much injury to the public must first be done, owing to nescience on this subject. To prevent which, I caused to be published in some of the newspapers, that there were difficulties to be surmounted in the business of vaccination. I was immediately accused, by my brethren, of too great selfishness and unfairness. Time, however, soon made the truth apparent.

It may be useful to say, that notwithstanding my embarrassments in vaccination, in the early stage of that business, that I succeeded even then in driving the small pox, and an experienced and skilful small pox inoculator, from the adjoining town of Cornwall,—doubtless, much to the benefit of the people in that vicinity. This fact shows the superiority of vaccination over inoculation, even in the public estimation. It likewise shows the influence which medical men have in society, notwithstanding the too great obloquy which they too often experience. The late Dr. Carrington, my-

self, and others, completely failed to make the business of vaccination profitable, notwithstanding our great attention.

SECTION II.

A PAMPHLET on the kine pock was published at Cambridge in 1810. That pamphlet was an extract, or partly so, from another treatise, entitled, "A prospect of exterminating the small pox, written in 1802, by *Benjamin Waterhouse, M. D. &c.*"

The curious and patient reader, by comparing the information contained in that pamphlet, with what is now published, for the first time, in the preceding section of this chapter, will perceive that there was an important difference in the mode of conducting the business of vaccination in Goshen, and in Boston. We in Goshen thought it our duty to exhibit much *demonstrative evidence* with respect to the utility of vaccination. We regarded the exhibition of such convincing evidence as then being an important part of our business; for we had no reasonable right to expect our employers to put implicit faith in merely our assertions on a subject so novel, and of so much importance to them, as vaccination certainly was. In about six months much *positive proof* was furnished to the people in that region;—more than sufficient to convince any reasonable person. In the vicinity of Boston the case was totally different. This will be perceived from the information in the pamphlet above alluded to. Aside from the evidence Dr. Waterhouse had furnished in July, 1800, upon his own children, it does not appear that any other suitable and convincing evidence, with regard to the benefits of vaccination, was made apparent to the people in that region, during the long space of more than two years from the commencement of so interesting a business. Those who vac-

inated in that vicinity, having neglected to furnish such evidence as the public good wanted, the public authority of Boston, in November, 1802, gave such evidence. They are said to have been influenced to do this by Dr. Waterhouse, and others who vaccinated. The experiment of said authority was made upon nineteen children, and was very satisfactory. The public authority of Boston thus obtained the honour of first establishing the utility of vaccination in that neighbourhood, upon the satisfactory basis of experiment. The public want on that subject, however, should have been supplied sooner. There was no need of permitting the public authority to acquire the honour which, it was easy to foresee would be obtained from first establishing the utility of the kine pock. That honour, of right, belonged to the faculty. Those who vaccinated could easily have inoculated their own vaccinated patients, without violating any public law, as was done in Goshen. No evil would result from such a practice, unless the true small pox was actually communicated to those patients.

Such an event obviously could not often happen, if vaccination was worthy of attention, and if the physicians had acquired the skill needed to conduct that branch of their business.

Much true testimony continues even now to be wanted in relation to the cow pock. This induces me to say, on the one hand, in its favour, that I have happened to know one instance, where a person who had been vaccinated, *secundum artem*, fifteen years before, did the duties of a nurse without any self-harm, for another person who died with the small pox. On the other hand, I am compelled to say, that I have known another instance in which death was occasioned by, or in consequence of, the *genuine cow pock*. I have known many instances where vitality was vitiated for a considerable time by vaccination. The sum total of evidence is, however, undoubtedly highly in favour of the utility of vaccination; yet, there is some intelligence from Edinburgh not so pleasant as could be wished respecting it. Human vita-

lity is different in some distant climates. Whether such a cause may occasion a variation in the action of the vaccine lymph, may be a question of some moment. Is its *prophylactic* power the same in degree in all climates? and does it continue to be the same? Its friends may have occasion to answer such questions. Is it not expedient, *in the present state of our knowledge*, to have recourse to the cow for vaccine virus as often as may be practicable? or is such trouble unnecessary?

The writer thinks proper to make the subsequent remarks. Connecticut contains about two hundred and sixty thousands of inhabitants. The writer is well acquainted with almost every part of the State, and he should say, that, during the whole of the last thirty years, less than one dozen persons had died with the small pox. This, however, is an opinion merely. We, the people, are indebted for so great a blessing to two causes: 1. Vaccination; 2. Public law. Vaccination, particularly in country townships, is not generally attended to even at the present day. If, however, the small pox occurs, the infected are at once separated from the rest of the community, and vaccination is then instantly brought into operation, and the small pox arrested. Vaccine infection can always be obtained from public institutions. In the States south and west of New England there are no laws in relation to small pox in particular, as is believed. The small pox oftener prevails in some of those States than in New England.

It is thought that the preceding history will benefit our readers, by teaching, that much previous knowledge of mankind, and erudition are both needed before a person tries many of the new schemes which are perpetually forced upon notice by false as well as true literature. The history shows that in the practice of medicine, there is often much difficulty to be overcome before a person can reasonably expect to do justice to an *untried practice*, even when such practice may finally, in skilful hands, be useful. The history likewise shows how difficult it is to overcome blind prejudice, or to convince others of a beneficial truth. It, however,

shows that persevering efforts will ultimately succeed in changing public sentiment in such a case.

In illustration of the opinion just given, it may be mentioned, that the efforts recently made to convince the public that peat or turf should be more used as fuel than is the case at present, begin even now to have some small beneficial effects. See Silliman's *Journal of Science*, and some newspaper publications.

CHAP. IX.

We have concluded to republish, from the *New-England Journal of Medicine and Surgery*, the following; *still hoping to induce some young Surgeon, to learn to perform Lithotomy, in the best, although not in a fashionable, manner.*

EXTRACTION OF THE STONE.

An attempt to demonstrate, that the Bladder may be opened for the extraction of the Stone, by a posterior method of operating, more conveniently to the surgeon, and with much greater safety to the patient, than by any other method hitherto discovered.

By Elisha North, M.D.

THIS subject may be illustrated by first showing, in detail, the manner in which, the operation is to be performed, and exhibiting the advantages which may result; and then obviating such objections as may arise.

The reader is supposed to be well acquainted with the anatomical structure of the parts concerned in the operation of lithotomy, and with all the methods which have hitherto been contrived for performing the same; otherwise what is written may not be intelligible to him.

If the writer had the benefit of suitable plates, it would render both his and the reader's task more easy.

A suitable table of convenient height and breadth is to be provided, and from the legs of the same let there be projections of wood at one end. These projections should form a right angle with the legs of the table, and may be about the length of the patient's legs—the distance from the uppermost surface of the table, at which these projections of wood should be attached to the legs of the same, may be ascertained by measuring the length of the patient's thigh.

The table and every thing else being ready, and the previous operation of introducing the long grooved staff being finished, and the staff being secured in its proper situation by the hand of an assistant or other means, the patient may now be put on the table upon his belly, in the kneeling posture, his knees and legs resting upon the projections of wood above mentioned—his thighs and legs may now be properly secured in this situation—the penis and staff should hang downwards, near to, and over the edge of the table. The patient's arms may be brought downwards in contact with the fore-legs of the table, and there secured. The fore-legs of the table should be shorter than the hind ones, so that the patient's body may be thrown into the position of the *inclined plane*. His head and face may rest upon a pillow.

If we have expressed ourselves so as to be understood, the reader will perceive, that this position is essentially the same as the one in common use for performing the operation of cutting the *fistula in ano*; and a moment's reflection will, we think, show, that the same position may be proper either for cutting into the bladder through the prostatic gland, or for cutting into the rectum, as these parts lie in contact.

A suitable low seat will enable the assistant-surgeon to manage the long staff. The operator will be conveniently seated posterior to the patient between his legs. He will now have all the parts on which he has to operate in a proper position for that purpose. He may then make the first or external incision precisely as it is now done by the best surgeons; and also slit up the membranous part of the urethra in the usual manner, cutting into the groove of the long staff. The common female grooved staff may now easily be introduced into

the bladder, taking the groove of the long staff for a guide. This last instrument may now be withdrawn, as the surgeon can have no further use for it.* Or if the surgeon dislikes the female staff, he may furnish himself with a director made like the common grooved director in every surgeon's pocket-case, only a little longer, and having a suitable beak at one end, to facilitate its introduction upon the groove in the long staff.† What we insist upon is, that the groove in this director should be straight, as every one knows, who knows any thing on the subject, that it is much more convenient for the surgeon, and, we believe, much safer for the patient to carry forward any cutting instrument in a straight direction than in a curved one. It can hardly be necessary to mention, that this almost straight director, (the beak part being a little curved,) should be introduced with an alternate kind of motion by which the urethra will be gently stretched from side to side, greatly facilitating the introduction of such an instrument. By turning the groove of this director to one side, the operator is enabled to make, with almost any kind of knife, the true lateral incision in the prostate gland and neck of the bladder. It may be done very well with the common gorget, the beak being ground off, provided he can use that instrument with his left hand.‡

* We wish to observe that we are aware, that one who was much in the habit of performing the operation of lithotomy might prefer to carry in the common gorget *inverted* upon the groove in the long staff, without the introduction of the straight director. This such an operator might easily do. *All we mean strenuously to contend for is, that our position of the patient ought to have the preference, and that our directions are suitable for the inexperienced operator.*

§ We also think proper to remark that a dexterous lithotomist might, without the aid of our table, make a very simple business of this operation upon a resolute patient, simply by putting him upon his hands, elbows and knees, upon a couch or some such piece of furniture, placing himself behind.

† A Cut, or representation, of such a grooved director, as is above described, may be found in the *New-England Journal of Medicine and Surgery*, Vol. XI. fronting page 113.

‡ It can hardly be necessary to say, that a surgeon, who prefers to use the knife with his right hand, should cut the right half of the prostate gland, instead of the left, and make the external incision suitable for such a purpose.

This can make no difference to the patient.

The advantages obtained by introducing the straight director, are these—it brings the hands of the operator nearer to each other when he makes his incision into the bladder. This gives him more steadiness—he also gains the power of pressing down the bladder at a greater and safer distance from the rectum—it enables him to introduce a common scalpel, if he prefers that instrument to the gorget. The knife, however, should be of sufficient size to make the opening in the prostate gland and neck of the bladder, large enough to admit the finger, as the operator may want to carry in a smaller knife, turned flatwise upon his finger, with which he is to enlarge the wound by *lateralizing* the instrument. It may be proper to mention that it is contended of late that the wound in the prostate gland and neck of the bladder ought not to be too large, lest the *prostate fascia* might be injured.

The reader will now perceive that the parts proposed to be cut are the same, as the best operators have determined should be cut.

Our next object is to show that this mode of operating is preferable to any other. With this view we wish to suggest to the reader the following considerations:—It is well known, that the dread of inflicting pain and the want of suitable habits, owing to the infrequency of performing important operations, are the difficulties with which the surgeon has to contend.

The operations of the mechanic are so often repeated, that he easily acquires the necessary associations, constituting habit. This renders it easy for him to accomplish what he frequently has occasion to do. It is also well understood, that our hands, and the association of the muscles connected with them, are such, that we can perform any motion downwards with more facility than the contrary way. We can also do a nice mechanical act better with our hands close to us, and near to each other and directly before our eyes, than at arm's length:—we also gain a mechanical advantage by sitting at our ease.

Now it appears to us that many of the foregoing principles in human nature are unnecessarily violated by performing the operation of lithotomy in the manner it has hitherto been done.

The surgeon is required to make an orifice into a hollow vessel, for the bladder is nothing more, into or near its under side, and this vessel is so far posterior to the os pubis and os ischium, that these project in his way.* To make this orifice, he has to move his hands upwards, and at times they are at a great and inconvenient distance from himself and from each other. He has also to shift his position in the midst of the operation, his hands, at the same instant, being confined by holding in contact two slippery instruments—and, what is still worse, he has to carry in, by the sense of feeling principally, that uncouth instrument, the gorget, upon the under side of a curved director; which movement is an inconvenient and unnatural one, besides being a critical one—yet this critical movement is to be performed with his hands at a great and inconvenient distance from himself and from each other. It is not so strange that the surgeon, who is called on to perform such a variety of motions, all of which are so contrary to his natural and usual associations and habits, and that too at *distant intervals*, should consider this the most important and difficult operation in surgery.

Notwithstanding philosophers and surgeons have chosen to perform the operation of cutting into the bladder upon its under side, (except in what is called the high operation,) for, say 2000 years, yet it is perfectly obvious, that were a common mechanic called on to make a similar opening into a hollow spherical body of wood or other substance, he would go to work with his tools upon its upper surface. Were he asked

* For the scientific reader will recollect, that when a perpendicular is erected from the lower extremity of the os coxycy, the bones of the pelvis laying upon a horizontal plane on the back or spine, that the portion of the tuberosity of the os ischium on which we sit, projects about three inches from this perpendicular. Now, the opening in the bladder is made in the region of the perineum,—not in the region of the lower or inferior portion of the tuberosity of the os ischium. If the scientific surgeon will place the bones of the pelvis before his eye in the position which we contend is the proper one for the patient, who is to undergo the operation of lithotomy, and carefully attend to what we have written, we believe he will comprehend our meaning without the aid of plates.

the reason why, he would say because he could do it more handily. He could not give the philosophical one, although he would perfectly well understand the fact.

Many of the foregoing difficulties will unquestionably be obviated by the method we propose. Besides other benefits are expected to result. The surgeon sits at his ease during the whole of the operation—he operates upon the upper surface of a spherical body—the parts on which he operates are near him—his motions are downwards—he sees distinctly all he does—he conveys in his knife upon a straight director—his hands are near himself and near each other—his work is posterior to the os pubis and ischium ; hence the danger of cutting the pudic artery is lessened—the rectum is also safe. All the motions of the surgeon are natural and easy—hence self-confidence and consequent steadiness must be the result.

The patient, as well as the surgeon, is more comfortably situated ; for he has the power of closely embracing a solid substance during the moments of pain. The common position, as the celebrated John Bell has said, “ is a horrid one in the extreme.” The patient is put in the unnatural situation of a half circle upon his back—his hands and feet tied together, and the movements of one who is to inflict pain directly before his eyes.

We now proceed to obviate such objections as may arise. It may be said, and with truth, that none but an anatomist ought to attempt to perform this operation ; and that the anatomist is in the habit of dissecting and contemplating the relative situation of the parts in the perineum, and within the pelvis, anteriorly ; and that it would be difficult for him to break in upon his association of ideas on this subject. The answer is, teach the young anatomist to dissect these parts posteriorly, i. e. by turning the subject over on the belly, for this is the most convenient way for this dissection, as well as for cutting for the stone, and then his ideas will be correctly associated.

It may be said, that he who manages the long staff may

not be so well accommodated. Admit this to be so, the part he has to act is a very unimportant one, compared with that which the operator has to perform, and whose convenience should have the preference in a case of this sort?

The introduction of the long staff in one position, and opening the bladder in a different one, may displease the prejudices of some. As, however, the distress of the patient is not thereby increased, we think the objection of little importance.

It may be said that the stone could not be extracted in this way so easily. Now this, we think, cannot be true. If the operator wanted to tap a hollow vessel, which he could not turn over, to draw out a fluid, he would make his orifice near its lower surface. But that is not this case. In this case he wishes to retain the urine to keep the bladder distended, until he can hunt up and fish out with his forceps the stone or stones. If there are other objections they do not occur to us.

We are sensible that we shall at first shock the prejudices and previous associations of able and experienced lithotomists. We wish to be permitted to inform such, that what we have written is not mere closet speculation; but that we have dissected, and seen dissected by others, the parts concerned in this operation repeatedly, and that we have performed the operation of opening the bladder on the dead subject, both by the posterior and by the anterior method, with a view of determining which ought to have the preference. The result of these comparative trials has been to us highly satisfactory. Indeed, we cannot now perceive, why this hitherto most difficult and dangerous operation is not rendered as safe for the male patient, (although it may take a little more time to perform it,) as for the female, which last operation is not thought much of by surgeons.

It may not be uninteresting to take into consideration some of the causes which may have contributed to prevent a discovery of this sort, especially when it is considered what a variety of plans have been contrived to get into the bladder.

Surgeons have been in the habit of considering the introduction of the grooved staff and cutting into the bladder, as one operation. They should have been regarded as two. This has led to the mistake ; for the position which is proper for one of these operations, can never be convenient for the other.

Another circumstance may be mentioned ; the anatomist is in the habit of first dissecting the abdominal and other viscera, his subject very properly lying on the back. Previous to dissecting the perineum he introduces the staff ; to do this he has no occasion to alter the position of his subject. To obviate the inconvenience arising from the anterior part of the pelvis projecting in his way, he places or puts under it some hard substance, in order to raise it up so as to enable him to get at his work. It never occurs to him, that if he would turn over his subject, all his difficulties would vanish. Besides, he is taught that it should be done in this manner with a view to the operation of lithotomy. Thus one error begets another, and is propagated from age to age.

Since the above was written we have received from London a splendid small work, with elegant plates, published in 1824, by C. Aston Key, a surgeon, under the patronage of Sir Astley Cooper, (London.) Mr. Key's main object is to recommend a knife, and a *long grooved straight director*, for cutting the prostate gland in lithotomy. He says, such a straight instrument as he recommends, can with facility be introduced from the end, or head of the penis directly into the bladder, both in the adult patient and in a child. The moveable parts in the perineum will yield or move, so as to permit this to be done. He also maintains, that by conveying a knife properly upon such a straight grooved director as he uses, the prostate gland is cut nearer to the manner in which it was done by the celebrated Cheselden, than is the case in the common Gorget operation.

Mr. Key is requested to place his patients, in future, on the

belly, as we propose. He may then cut through the membranous part of the urethra into the groove of his director with great convenience. When he cuts the prostate gland, his two hands should be nigh each other to insure steadiness and precision. This convenience may likewise easily be had, by passing a flexible substance, such as a suitable piece of leather, tinfoil, or sheet-lead, round his director, through the slit made in the urethra. He can then steadily hold the director at this place with the thumb and forefinger of one hand, and use the knife with the other. The assistant who holds the handle of the director at the head of the penis will, of course, comply with the wishes of the surgeon. Mr. Key's operation, if thus done, will be very much like the one which we have formerly recommended; and it may be better, for ought we know; for we have not yet tried it. Mr. Key can withdraw his long director, and use our *short straight one*, if, upon trial, it should be found to be more convenient.

We agree with Mr. Key, Mr. Dease, and Le Dran, in giving a most decided protest against the common practice of passing a beaked cutting instrument of any kind upon a curved director. It is too difficult and unnatural a movement to be well done, in first operations, by any one; and it can hardly be necessary to remind lithotomists, that every such person must commence his business by such operations as are now alluded to. A lithotomist certainly ought not to endanger the life of his first patients more than is necessary. The continued use, for so great a duration of time, of the curved director, and that uncouth and dangerous instrument, the common gorget, does not redound much to the honour of the mechanical ingenuity of surgeons.

We hope that what is now said may have influence enough with some young surgeons to induce them to learn to do this important and hazardous business, in such a manner as, in our deliberate opinion, it should be done; and we hope to be excused by old ones for what has been so frankly said. How long a time was required to enable Sir Cæsar Hawkins to introduce into the hands of surgeons his Cutting Gorget, we do

not know ; neither can we tell how long a time it may take to banish its dangerous use from surgery ;—dangerous, at any rate, when used with a curved director. We believe that the best good of patients requires that surgeons, like other mechanics, and even much more so, should do operations in a way that is most convenient *for themselves*. A surgical reader, by comparing what has now and formerly been written with what Mr. Key and others have published, will, it is believed, comprehend the subject.

That very eminent surgeon in Baltimore, Dr. Jameson, would probably have performed his highly important, successful, and novel operations upon the prostate gland,—which were done for the cure of stricture,—more conveniently for himself, if he had placed his patients upon the belly. See the American Medical Recorder.

It is now eleven years, since we endeavoured to introduce among surgeons an important improvement respecting lithotomy. It would seem that a high station ought not to be necessary to success in such a case, when one addresses men of sense and intelligence.

CHAP. X.

ON DYSENTERY,

*By William Robinson, M. D. of the Connecticut
Medical Society.*

THE subsequent valuable unpublished, or manuscript Essay, has been furnished the present author, for the benefit of the public.

SECTION I.

A JUST pathology of diseases has ever been considered an important desideratum in the science of medicine. Hence the numerous attempts to improve it: and from this object, have arisen the various systems of general pathology, which have been offered for the consideration of the medical public, within the last half century. Very few of the ancient systems of pathology are retained at the present day, but have given place to those systems of recent date. The pathology of one disease, however, has continued, with little variation or improvement, for a great length of time. This disease is called by the schools, Dysenteria, and, in common parlance, Dysentery, Bloody Flux, or Camp Distemper. On this disease I propose to offer some remarks, which have resulted from facts and observations, which have occurred to me in a long course of practice. I offer my opinion on this disease

with much diffidence, as I am aware they differ from respectable authorities, who have gone before me on this subject, which have fallen under my reading ; but every physician may drop his mite into the general treasury of medical facts ; I therefore will ask the liberty to offer my humble tribute to the common stock of practical observations.

Every physician is doubtless familiar with the symptoms of dysentery, as laid down by the most respectable authors ; yet, as many complaints are supposed to be dysentery, which I conceive do not fairly come under the appellation, I will state the symptoms which constitute the disease under consideration, as well as notice some of the symptoms of other complaints analogous to it, which I consider not dysenteric, but liable to be confounded with it. In the first place, then, the symptoms of genuine dysentery, are as follow : This disease is generally ushered in by cold chills, which are soon followed by Pyrexia, with loss of appetite—nausea—vomiting—pain then siezes the belly, which is soon followed by tenesmus, frequent stools, which are first mucus, serous and frothy, but, as the disorder progresses, the stools become streaked with blood, or, in many instances, with clear blood, and not unfrequently, have the appearance of beef brine. As the disease advances, the tormina and tenesmus become violent and intolerable. The disease occurs, as an epidemic, in summer and autumn, at the same time with summer and autumnal intermittents and remittents, and also in winter, sporadically, under peculiar states of the system, as shall be particularly noticed hereafter.

The complaints, with which dysentery may be liable to be confounded, are, 1st. Hemorrhage from the liver, or from Hematemesis, when the blood is not only vomited, but thrown in considerable quantities into the intestines, and discharged by stool. In either of these cases, the distinction is readily made, for these sanguineous discharges are attended with little or no pain in the bowels, and no tenesmus.* 2nd. He-

* The writer of the above will excuse the author of this work, if he dif-

morrhage from the bowels, which takes place from drastic cathartics, commonly called Hypercatharsis. This last may be easily confounded with dysentery, as considerable tormina and sometimes tenesmus is attending; this, however, can be distinguished by carefully attending to the circumstances of the case. I have now given the general list of symptoms attending dysentery, and have noticed those complaints with which it may be liable to be confounded. I now proceed to give my views of the pathology of the disease, and the methodus medendi.

Some 20 years ago, I observed that my patients recovered much sooner and better, with cathartics, composed wholly or principally of Calomel, than with any other cathartics. In the course of this practice, one of my patients was accidentally salivated; I was somewhat disappointed at this unexpected event, and not a little alarmed at the sudden cessation of all pain and dysenteric symptoms; fearing that gangrene of the bowels was approaching; yet my patient did not assume the Hippocratic countenance, nor did involuntary stools occur, nor any other threatening symptom appear, but rapid convalescence and perfect recovery ensued.

This put me upon a train of reflection, to account for the phenomena. Had the dysenteric symptoms depended on idiopathic inflammation of the mucous membrane of the intestines, as I had previously conceived, I was at a loss to account for this sudden cure of this formidable complaint. However, having previously paid considerable attention to hepatic diseases, and having frequently observed the controlling effect of mercurial medicine over hepatic diseased action.

fers from him in opinion, in relation to the cause of Hematemesis. The celebrated Mr. John Howship, in London, has ascertained by post mortem examination, that in one case, "*The bleeding had taken place from the capillary, or exhalent arteries, upon the internal surface of the great intestine, and, although it was evident that every part of the bowel had been a bleeding surface, no part had suffered ulceration, nor was any part inflamed, though whole was very red.*" Mr. Howship thinks, that this bleeding is dependant upon a scorbutic diathesis. At any rate, he says, that he cured several patients by treating them agreeably to such an opinion.

I was led to shift the ground I had previously taken, and was induced to trace the cause of the dysenteric symptoms up to hepatic diseased action, and that the intestinal affection was a sequela of the hepatic derangement. It is a fact, which I believe will be acknowledged by most physicians, that unequal distribution of excitement takes place, more or less, in all cases of acute fever, whether that fever be Synocha, Synochus, or Typhus. This accumulation of excitement, perhaps, takes place more frequently on the head, and back, than elsewhere; still it takes place in other parts, especially in some cases of Typhus, in a finger or toe, in an arm or a leg. If this be the case, why may not this accumulation of excitement fall on the liver? I can conceive of no good reason why it cannot. I shall therefore assume the hypothesis, that in dysentery it does take place in great force on the liver, affecting powerfully the secretions of that organ, increasing the quantity probably, and doubtless injuring the quality of the bile; for it appears very likely that none but an healthy action of that viscus can produce healthy and inoffensive bile. Under the accumulated excitement of this organ, a hurried secretion takes place, and an increased quantity, and a vitiated acrid quality of the bile is produced. It is thrown into the bowels with all its vitiated qualities, and there excites excoriation, spasm, tormina, tenesmus, and eventually inflammation and its consequences. This acrid bile passes through the bowels with rapidity, from the irritation which it excites, until it arrives in contact with the sensitive sphincter ani, which is thrown into spasm and constriction; thus, its evacuation being prevented by the constriction of the sphincter, it regurgitates upon the rectum and colon, where it remains, abrading and excoriating those parts of the canal, until inflammation, ulceration, and gangrene ensue, unless timely prevented by proper means. As a corroborating fact of the lodgement of this acrid bile on the colon and rectum, I would mention that all the records of, post mortem, examinations which I have seen, agree in their reports, that the rectum and colon are the only portions of the intestines which are found affected with marks of severe

inflammation, and its consequences, ulceration and gangrene.

Now, if idiopathic inflammation were the proximate cause of dysentery, why would not other portions of the bowels be equally liable to be attacked?

It appears, therefore, probable that the inflammation found by autoptic examination, or ulceration and gangrene, is an effect, a consequence, of hepatic derangement, rather than idiopathic inflammation of the mucous membrane of the bowels, in producing dysentery; and that all the symptoms, purely dysenteric, are produced by acrid bile poured into the canal under this morbid excitement going on in the liver; hence, when healthy action is restored to this organ, the dysenteric symptoms spontaneously subside.

I have mentioned in the commencement of this essay, that sporadic cases of dysentery occasionally took place in winter under peculiar states of the system, and have promised to notice this variety of the disease particularly. I now redeem the pledge. I have, many years ago, observed sporadic cases of dysentery in winter, though very rarely, but was perplexed to account for them. I am now, in some measure at least, relieved from that perplexity.

In the month of February last, a young woman who laboured in the basement story of a cotton factory, which was a very damp apartment, was attacked with acute fever of the remittent type; very soon dysenteric symptoms appeared; the case wanted none of the usual characteristic symptoms of the disease, as it occurs in summer or autumn. I inquired critically into the previous state of my patient's health. I found she had complained for some months of an obtuse pain in the right side; that there was, and had been, considerable tenderness and tension over the region of the liver, and uneasiness in attempting to lie on the left side; in fact, all the usual symptoms of chronic hepatitis.

The treatment consisted, in the first place, in reducing the inflammatory diathesis by the use of the antiphlogistic regimen, and by a mercurial course carried to the salivating point. The hepatic complaint gave way, and the dysenteric

symptoms ceased on the appearance of ptyalism. This case would probably have been no more than a common case of remittent, had it not been for the previous diseased state of the liver; but that viscus, being under diseased action, became a vulnerable point on the accession of fever, and dysentery ensued, although out of the usual season. Like cases have doubtless happened to others. How far this case goes in support of the pathological doctrine I have advanced, will be submitted to the judgment of the reader.

I now come to the method of cure. This, perhaps, in its leading point, will be anticipated, from the mode I have taken in discussing the pathology of this disease.

The curative indications seem to be five:—1. To reduce the inflammatory diathesis in the incipient stage of the fever; 2. to restore the healthy action of the liver; 3. to relieve and come to a truce with the tormina and tenesmus; 4. to sheath and defend the excoriated bowels; and 5. to neutralize the acidity which may be present in the *Primæ Viæ*. The first indication will be answered by the use of the antiphlogistic regimen, according to the circumstances of each case, and the nature of the epidemic fever, whether it be Synochus or Typhus. If the fever be Typhus originally, no reduction will be required. The second indication is as follows: Mercury, the great catholicon in this disease, is to be administered till it arrives to the salivating point, in all cases where the least danger is to be suspected. Very slight cases may not require salivation, although it removes the complaint, on the slightest degree of salivation. I have given to others, and taken myself, thirty grains of calomel in twelve hours, with the happiest effect; yet I have generally given it in smaller doses, and stayed it with opiates until it had the desired effect. It is, however, to be acknowledged, that mercury is an edge-tool, and is to be carefully handled and closely watched in its operation. In two cases I have known it to produce hypercatharsis, (after it had produced salivation,) which was very inconvenient and troublesome, and would be suspected by the inexperienced practitioner to be a continuation of the disease;

but I think we can *always* rely on salivation in removing the disease; therefore, if frequent stools and some tormina, and even tenesmus, remain after ptyalism takes place, we may safely attribute it to hypercatharsis from the medicine, and treat it accordingly. Hypercatharsis seldom happens; but if it should, we should carefully make the distinction between it and the disease in question. It is also to be observed, that, in administering this medicine to children, more caution is required than in the cases of adults, as their mouths and gums are more liable to run into gangrene from its use.

I have also found, in some constitutions, from idiosyncrasy, or extreme irritability of the stomach and bowels, that calomel could not be retained; opiates would not retain it in sufficient quantities to have the effect required. In these cases I have succeeded by inunction,—by rubbing in half a drachm of the Ung. Hydrarg. fort. over the region of the liver, once in two or three hours. After all, calomel is altogether the best preparation in this disease; the blue pill is too inert in most cases, as *promptitude in action* is required in all cases of urgency.

The third indication will be answered by the use of opiates, and they are highly necessary in relieving pain, as well as in staying the mercurial medicine upon the system.

The fourth indication is merely auxiliary, and consists in a free use of demulcents, such as flaxseed tea, a solution of gum-arabic, arrowroot, &c.

The fifth indication is to be answered by alkaline medicine. In this disease there appears to be a redundancy of acidity in the first passages; and I think that I have seen considerable benefit resulting from the use of alkaline medicine, although Dr. Murray suspects them to be incompatible with mercurial medicine. I do not recollect to have noticed any such effect in their use.

I will close these remarks by a short quotation from a long account of the disease (dysentery) at the General Penitentiary, by P. Mere Latham, M. D. Fellow of the Royal College of Physicians, and Physician to St. Bartholomew's Hos-

pital, as recorded in the *Medico-Chirurgical Review*, printed in New-York, for July, 1825. No. 5.—Says Dr. Latham, “Sometimes, the day after the first large dose of calomel and opium, we found the patient exulting that he had been cured as by a charm; that he had slept all night, and his pains were gone; and that he had had several evacuations, of which the two or three last were almost natural. With this sudden improvement, salivation had already arisen, or it was at hand. Under these circumstances, the use of the mercury was suspended altogether, or small doses of calomel and opium were given until ptyalism appeared, which was generally obvious at our next visit.

Our ultimate object in all cases was to produce salivation; but in these cases of severer suffering, we found a salutary impression capable of being immediately produced by a few large doses, or even by one large dose of calomel and opium. This it was expedient to make the most of. Nevertheless, this immediate salutary impression was soon lost, unless the same practice was followed up to salivation; for which purpose mercury was afterwards sparingly or largely exhibited, according to the circumstances set forth.”

Editorial remarks.—We think the foregoing document is a tolerable set-off against the clamour which has been lately raised against the use of mercury in the bowel complaints of hot climates. This clamour, as we well know, is founded in prejudice, or, what we are sorry to say, is worse than prejudice, in the personal opposition of writers; but “omnia vincit veritas, et prevalebit.”

SECTION II.

The above essay was read before the Medical Society of the County of New London on the 16th of April, 1827.

About a year and a half afterwards a medical friend loaned me a treatise on the diseases of tropical climates and dysentery, written by James Johnson, M. D. of London, which was the result of an extensive practical experience in the East Indies.

This was the first piece I had seen published ascribing dysentery to hepatic derangement, although I had taught this pathology of the disease to the young gentlemen under my instruction, as well as expressed my opinion on the disease to my neighbouring practitioners for twelve or fourteen years. I am happy in having my views of the complaint supported by so respectable authority as Dr. Johnson. Dr. Johnson does not *theorize* from the same premises, exactly in the same manner as I have done; but the origin of the disease and the method of cure are precisely the same; and this is the main point. It is manifest to me that the disease has the same origin in all climates, and the method of cure ought to be the same. I reside in about latitude $41^{\circ} 25''$ N. and have made the same practical observations on the disease here which Dr. Johnson has made in the East Indies, and probably about the same time.*

Stonington, (Con.) Nov. 1829.

* Whether the opinions of Dr. Robinson and Dr. Johnson, *which were formed independently of each other, and in different climates*, are correct, may probably be hereafter more fully ascertained by, post mortem, examinations, and from symptoms, aside from the presumptive evidence, derived from their favourite medicine in dysentery. Let the fact be well settled, that dysentery is *always a liver disease in the first instance, combined with fever, or febrile irritation*, and little evidence will be needed to convince medical gentlemen that calomel, either alone or combined with opium, &c., may be the best medicine, at least in dangerous cases, and that it should be used promptly. It may increase confidence to say, that Dr. Robinson has been engaged in extensive medical practice more than forty years.

ADDENDUM.

AFTER our Physiology was in the press, the subsequent elegant paragraph from Prof. Lardner, in the London new University, (Eng.) was put into our hands by a friend.

‘ In mechanical philosophy,’ Dr. Lardner observes, ‘ the superficial physiologist will learn how unphilosophical it is to assume, that matter in different arrangements obeys different and inconsistent laws, and he will become convinced that such an hypothesis is as untenable as it is unnecessary. The zealous professor of a pure religion will be taught, that so far from mechanical reasoning having a tendency to prove that the body derives the principle of life from its own mechanism, all the analogies take a diametrically opposite direction, and demonstratively establish the impossibility of such a phenomenon.

‘ That you may not receive this assurance merely as a dictum, let us consider what constitutes a Machine, whence it derives its virtue, and what are its objects ? A machine is a combination of parts composed of material substances, solid or fluid, or both, as the case may be, having certain definite forms and arrangements, and possessing certain capabilities of transmitting force or motion. Its objects are to move, press, sustain, combine, divide, or otherwise modify, those substances to which it is applied. But the machine itself, merely as such, cannot accomplish this. It possesses not its own principle of motion ; it cannot urge its own levers, or stretch its own cords, or turn its own wheels, or put its own fluids into circulation. The application of some efficient cause extrinsic to, and altogether distinct from the machine itself, is necessary to accomplish this. This extrinsic cause, whatever it be, from

which the machine derives its motion and efficacy, is called the *prime mover*. The point on which I desire now to fix your attention is, that this prime mover is altogether distinct from, and independent of, the machine; that it possesses, or at least may possess, no property in common with it, and that its existence or non-existence is not decided by the existence or non-existence of the machine. The machine may be broken, destroyed, worn by age, or otherwise disabled, and yet the prime mover may still retain its original energy. Thus a steam-engine is moved by fire, a mill by wind or water; the steam-engine may deteriorate by age, and the mill be broken to pieces by accident, and yet the fire, and the wind, and the water, will still preserve their powers. Now, these observations, which I think correctly describe a Machine, may, *mutatis mutandis*, be applied to the Human Body. This body is also "a combination of parts composed of material substances, solid and fluid, having certain definite forms and arrangement, possessing certain capabilities of motion and force," destined and admirably adapted to obey the dictation of its Prime Mover, the living principle, the immaterial spirit. So long as it pleases the great Engineer who constructed this body, to permit its connexion with that intellectual spirit, so long will it obey the impulses which it receives; nor does the decay of this Bodily Machine infer any corresponding decay in the moving Spirit, any more than the wear and tear of a Steam-engine proves the destruction of the principle of Heat which gives it motion. Neither are we to infer, because this Bodily Machine in its obedience to the Vital Spirit acts mechanically, and follows all the ordinary properties and laws of Matter, that, therefore, the Spirit which moves it partakes of the nature of Matter, or is amenable to its laws, any more than we should infer that the levers, wheels, pumps, chains, cords, and valves of a Steam-engine are regulated by the laws which govern Heat. On the contrary, I submit it to the candor of the most sceptical materialist, whether the whole tendency of analogy does not directly overthrow the hypothesis that the principle of life is organic. We are told in THAT BOOK, of which both Christian and Jew equally acknowledge the au-

thority, however they may otherwise differ, that, in the first instance, "God formed man of the dust of the ground;" that is to say, he created that curious and beautiful machine, the organized Human Body—but that body was still an inert structure without the principle of motion or spontaneity; a more noble work remained to be performed, the immaterial spirit, the divine essence, *the prime mover* of this machine was to be applied, and accordingly we learn that God "breathed into his nostrils the breath of life," and then, and not till then, "MAN BECAME A LIVING SOUL."—pp. 31-33.

The above is introduced to show that many of us, in the medical profession in this country, are in scientific advance of very eminent London teachers, in relation to vitality. Dr. Lardner seems not to know what the *external* "Prime Mover" or Movers of the animal machine are. We have shown that *atmospheric pressure*, or the air, and *caloric*, are these needful agents. Besides, such animal machines, including those which are human, as are brought into existence by God, are immensely superior to any engines which are ever made by frail man. In illustration, the reader is reminded that animal machines have within themselves, the powers of self-support, self-repairing, and self-protection. Besides, two animals have the ability and inclination to procreate a third endowed with active properties analogous to their own. Such animal propensities do not belong to any artificial engine. Dr. Lardner's logic has, unfortunately for itself, the defect of proving too much. If *human* machines are moved by an immaterial spirit, the same must be the case with inferior animals. The latter conclusion would not be admitted by many.

Dr. L. has referred to Genesis, Chap. II. V. 7. The reader is reminded that figurative expressions are often used in the Holy Bible; and the one alluded to may be of that description.

Whether the recent metaphysical philosophy of Dr. Cahanis, on the continent of Europe, in his *Rapporte du Physique et du Morale de l'Homme*, resembles our own, we do not yet know. See the Rev. Edward Irwing's *Speculations*, or

“Signs of the Times,” very recently published in the Edinburgh Review, No. XCVIII.

Mr. Irwing's Speculations in this enlightened age will be very harmless, in relation to what he justly regards as mechanical, or material philosophy.

CERTIFICATE.

WE, the subscribers, hereby certify, that Dr. Elisha North, of this city, invented many years ago (we confidently believe about twelve years since,) a lancetted, metallic, elastic stilette, to move in a common silver catheter. The catheter had a slit made in the end of it, so that the lancet might be protruded without, and also drawn within, the catheter at pleasure. This instrument is now in possession of the Doctor, and was designed by him for cutting impermiable strictures of the urethra. It exactly resembles one which has been recently so successfully used by Mr. Stafford in London, or in England. The Doctor sent a drawing of his cutting catheter to an association of surgeons and physicians in New-York, about the time of its invention, hoping the instrument might be put to the test of experience in that city. The Doctor also took public measures to bring his instrument into notice and into use in his own vicinity. We do not, however, know that he has ever had a case requiring its use. For an account of Mr. Stafford's book on Strictures of the Urethra, and his success in cutting them, see the *Medico-Chirurgical Review*, &c. edited by James Johnson, M. D. in London, Vol. XV. page 216.

We have been induced to give this Certificate, with the double view of doing justice to our friend, Dr. North, and to our country, on the one hand, and on the other hand, of

bringing into *particular notice* among our medical brethren in this country, **Mr. Stafford's Treatise on Strictures of the Urethra.**

(Signed.)

New-London, (Con.)

November, 1829.

THOMAS COIT, M. D.

ARCHIBALD MERCER, M. D.

D. T. BRAINARD, M. D.

NATH. S. PERKINS, M. D.

ADVERTISEMENT.

Dr. Nathan Strong's Dissertation on Spotted Fever ; Dr. Thomas Miner's pamphlet on that subject ; an Essay by Samuel B. Woodward, M. D., on the same disease ; one, as is supposed, by the Hon. Benjamin Vaughan, Esq. of Hallowell, in the State of Maine ; and another by Dr. Henry Fish ; and also a considerable part of what is contained in my own Treatise on the Spotted Fever, with such additions as might easily and usefully be made, ought to be re-published in one volume, for the accommodation of medical students, and with a view to historical and practical evidence in relation to a very singular and new disease, or epidemic. At any rate, such republication ought to take place, if a small edition could be sold.

