

UNITED STATES OF AMERICA



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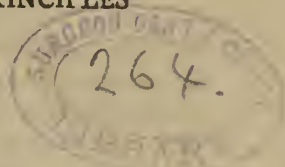
AN

ESSAY

ON THE

MOST FUNDAMENTAL PRINCIPLES

IN THE



SCIENCE OF MEDICINE,

ADDRESSED TO THE

MEDICAL SOCIETY OF PHILADELPHIA,

By JAMES PENDLETON, JUN. OF VIRG.

MEMBER OF THE PHILADELPHIA MEDICAL AND AMERICAN
LINNEAL SOCIETY.

ALIQUID SEMPER AD UTILITATEM AFFERENDUM.

CIC.

CITY OF WASHINGTON:

PRINTED BY SAMUEL HARRISON SMITH,

1803.

AN ESSAY, &c.

GENTLEMEN,

THE object of this essay is to offer opinions which have remained in silence, involving the most important principles in medical science; an accurate knowledge of which is indispensable for the proper treatment of disorders.

It must be admitted that theories in all ages of the world have been more frequently received from the warp of authority, than from a conviction of their propriety. This truth so fatal to the progression of science induced the immortal Cullen to say, that he wished the doctrines of great men could be delivered by persons low in authority, by which the free enquiry of others would be excited, and all errors thereby detected. The sentiments that I shall oppose may be found in the medical elements of Doctor Brown; whose information and inventive genius are as highly appreciated by me, as by any person, but doubtless no one ought to surrender his judgment to any mere authority however respectable, if so but few publications would appear, and the accurate St. Piere observes, that a child raised on the shoulders of an adult may command a more extensive view than the person who supports him. I will now proceed to the points in view, and having no other object than *truth*, shall avoid the unnecessary and misleading complexity of Darwin, in modifying the compression of Doctor Brown.

I shall first endeavour to prove that excitability is a compound of matter and quality, or of animal and mechanical power; secondly, that debility is only a predisposing cause to disorder, then conclude with shewing wherein the identity of direct and indirect debility consists.

Life is acknowledged to be a forced state, and the circumstances on which it rests, are stimuli and excitability; life therefore is excitement, and all the phenomena in health, predisposition and disorder are entirely referable to the same causes.

By excitability, I mean that great principle in animal matter, which may be excited by stimuli; and is composed of stimulability and vibrability.* By the former I mean sensorial power, nervous influence, or sensibility, which alone discriminates animate from inanimate matter. By vibrability, I mean that aptitude in animal fibres of being thrown into contraction, through stimulability and stimuli, or in other words, elasticity or contractility and *vis restitutionis*; and may be properly called the proximate cause of excitement, or life. Stimuli are those external agents that are capable of calling into contraction the excitability or aptitude for action above defined, otherwise to give rise to fibrous motion, through the animal and mechanical power.

Debility is divided into direct and indirect. By the former is meant that state of the system which follows the abstraction of stimuli; such is the effect of cold, venesection, abstemious diet, &c. all of which tend to diminish the excitement. By indirect debility is meant that state which is induced by excessive action, or is that quiescence which succeeds the preternatural operation of stimuli.

* An inanimate chord possesses an excitability that only consists of vibrability, but stimulability is a necessary component part of animal excitability.

I will now proceed with the consideration of that important surface on which stimuli act and which is properly termed excitability.

I have said that it was composed of animal and mechanical power, or of the matter of sensibility, and of the quality of contracting on sensation, † to elucidate which, let us first direct our view to ophthalmia. In this disorder, we see the serous vessels distended with red globules, the admission of which must not be ascribed to a diminished sensibility, but to a prostrated tone; for the sensorial power is preternaturally increased, the vessels being much more sensible of the operation of stimuli, than previous to the inflammation; but the vessels cannot contract from the application of stimuli, because their mechanical power is lost. An increase of sensorial power, though attended with a departure of tone, may be readily seen in the inflammation of all delicate vessels. Dr. Hunter in speaking of the felon, says there is an increased action but a decreased power ‡—by which he could mean nothing more than an increased sensibility, and an injured tone. This prostration of tone with an increase of sensorial power, is not confined to delicate vessels; but is seen in all cases of indirect debility that are not suddenly induced by a powerful stimulus, as laudanum, &c.

An increase of sensorial power in fever is very manifest, when the tone is much injured, for the pulse may be quickly raised by a stimulus that would effect no alteration in health. And I may

† By sensation I mean the first effect of stimuli on sensibility, or the first degree of motion that precedes or invites contraction. Next to contraction, come the diseased links of sensibility, which are, irritability, irritation and inflammation, or disordered action.

‡ It is very easy to conceive that increased excitement may attend a lessened tone, but the pulse is feeble, because the contraction is not full or complete; which I shall prove to be the most favorable state for the increase of secretions.

here ask if indirect debility was attended with a diminution of sensorial power, (which is the prevailing opinion) how can we account for this excitable state of the system in fever, and how can we explain the truth, that old persons are less liable to fever than the youthful, if we grant that direct debility produces an accumulation of animal or sensorial power?

If the sensorial power is a nervous secretion, and if secretion depends on action, it then follows that indirect debility is attended with an accumulation of sensorial influence, which is particularly evident in that involuntary action of the muscles, called the shaking palsy.

When fever reaches irregular action or ends in disorder, it is the consequence of a prostrated tone, and a morbid increase of animal or nervous influence, which is applicable, as I have before said, to nearly all cases of indirect debility. We find that the oppressed pulse that follows a morbid increase of action, cannot be raised by stimuli, only for a short time; but if we take the oppression from the vessels by the lancet, the excitement is immediately restored, and the stimulus that could produce no change in the pulse, now increases it much. This must not be ascribed (as it universally is) to an increase of the sensorial power, but of the mechanical power or spring. The vessels previous to the abstraction of blood, were as sensible of the operation of stimuli as afterwards, but the pulse could not be raised from the loss of tone, which is restored by the lancet.

An increase of sensibility invariably follows the application of stimuli, and the continuation of that increase is supported until the tone is nearly destroyed.

The sensorial power is destroyed before the tone only in those cases, where the system is operated suddenly on by a powerful stimulus: such a large dose of

of Laudanum, &c. which suspends the excitement from the destruction of the sensorial power, without a loss of tone.—In such a case, the remedy, that restores the spring of the vessels, revives the sensibility also; but the increased action that succeeds this prostrated state, is apt to sink the pulse by destroying the tone; and one bleeding may demand many, before the labor or excitement of the vessels will be brought to a par with their strength, particularly in delicate systems. It is consistent with what I have advanced and with accuracy, to admit two kinds of indirect debility, one from an increase of sensibility and a loss of tone, the other attended with a diminution of sensorial power and little or no injury of tone. This last is produced by the operation of powerful stimuli, (applied suddenly, as I have said) which oppresses the excitement, (by destroying the sensorial power) before the tone of the vessels could be injured.

Though the material part of excitability, or the secretion of sensorial power rests on action, yet we may discover it to increase when the action is much weakened, and it is in an accumulated and active state, when death has made a near approach. A morbid increase of all secretions is produced by a preternatural increase of action,* and the most favorable state for this morbid secretion, is the quick and feeble pulse, that invites the state of fever properly termed nervous, which is attended by an alarming secretion of sensorial power, and a prostrated tone. Disorders proceeding from an increase of secretion, are exclusively attached to the indirect debility, and those that require not this secretion, may be induced by either of the debilities.

* Consequently, indirect debility must be the necessary precursor to bilious fever, and I may add that this morbid secretion is the nourishing and supporting cause of fever.

I am inclined to believe that many persons die with a necessary quantity of sensorial power, and the cause of their death is a complete prostration of tone. This may be seen in persons who go off with inflammatory complaints and also in many who depart from old age, when the destruction of tone renders that remaining sensorial power useless; which would require but common stimuli to support long and healthy action, could it be translated to contractile vessels.

I cannot avoid offering a fallacious observation of Dr. Brown, produced by his false opinion of excitability. He says, that if the excitability (which he explained to be nothing more than sensorial power) was increased by the application of stimuli, that death could never appear. This continual increase of nervous influence, would surely be a preventive to death, if (as he says) life depended on nervous influence and stimuli alone; but it is manifest that to these he must add the contractile power of the vessels.

It is very evident that man under this increasing sensibility, without a proportionable increase of tone, would in ten days after birth be subjected to convulsions; and in short all the ligaments of life would be bursted.

This view of Excitability would have convinced the medical characters who attended our illustrious Washington, of the equal propriety of stimuli and the lancet. Bleeding was expedient to displace the obstruction, and that bleeding lessened the sensorial power, already too low from an advanced age.

I think, gentlemen, it will be acknowledged that excitability is composed of an animal and mechanical power, and that to ascertain at any time the measure of excitability (and the proper treatment) it is necessary to know the increase or dimi-

nution that has taken place in its component parts. The chief object of the Physician ought to be, to keep the sensorial and mechanical power upon a par, which necessarily adapts the excitement to the excitability.

I will now, gentlemen, present to your view, the impropriety of terming debility, disorder.

By disorder, we conceive an inordinate action, error loci, or an incapacity of the vessels to propel their fluids in a regular manner; which is produced by debility. Disease and debility which generally accompany each other, invariably precede disorder, and may exist a great length of time before disorder appears. Let us direct our attention to the first stage of Fever, when there is debility and an absence of ease; but irregular excitement or disorder does not appear until that ability injures the excitability so much as to render the vessels unable to support their natural operations.— Doctor Brown in attempting to prove debility disorder, defines good and bad health. The former he says is an easy, pleasant and exact use of all the functions of the body and bad health consists in an uneasy, difficult, or disturbed exercise of all or any of the functions. As to the accuracy of this statement we consent, but it does not follow that debility must be attended with unequal excitement, or that the absence of vigorous action, is necessarily a morbid one. The Doctor had acknowledged what he seems here to forget, viz: That the phenomena of life were, health, predisposition and disorder. I ask, what can constitute this predisposition, if not debility. Manifest must it be that disorder cannot appear, unless preceded by debility; and we may see instances of debility, not even attended by disease; as is strongly evinced by those, in the decline of life, who feel perfectly easy, under a manifest debility. If the excitement is proportionable to the strength of the

vessels, as much regularity exists in the functions as in the most healthy state of the system. The most emaciated and delicate persons may have health as well as the most robust, though they are not so far from disorder. An equalized excitement constitutes health, be that excitement at, any degree in the scale of life. The abettors of Doctor Brown, say that death frequently appears from debility alone, and ask how a liability to disorder can alone produce death. I reply that I have seen deaths from old age or debility, but with evident symptoms of the interposition of irregular action or disorder; for a certain grade of debility must produce an unequal excitement, and death cannot take place until that disordered action is produced; consequently no one can die with debility alone.

Doctor Brown extends his inaccuracy much farther, by saying that debility induced by high morbid action, is the highest grade of disorder, and the immediate precursor of death. He evidently puts the cause in the place of the effect, for morbid action (as I have proved) is the consequence, and not the cause of debility.

If debility was disorder, it would at all times be improper to deplete. As disorder then is an irregularity of action produced by debility, it must be granted that debility is only a predisposing or inviting cause to disorder.

I am now led to consider the unity of the two debilities, which Doctor Brown and others have opposed from their being induced by opposite causes; one by an abstraction of stimuli, and the other by the application of a preternatural quantity. To their opposite causes I consent, but I hope to prove that their difference does not necessarily follow. It cannot be difficult to conceive that different causes may terminate at the same point by an extension of operation. An increase of action as to the mind or body must finally produce the

same symptoms as a direct diminution of action, and a difference of causes must make an identity of debility, before disordered action can appear. Doctor Brown confesses that they are attended with an equal diminution of excitement, and consequently with an equal derangement or disease of excitability,* which establishes their identity beyond the reach of doubt. This equal loss of excitement, (or aptitude to inordinate action) is doubtless the inosculating point of the debilities, and the invariable precursor of disorder; for morbid action from direct debility cannot take place until the excitement is as far below the standard of perfect health, as it must be from indirect debility.

It has been urged in this society that inflammation is more apt to attend direct than indirect debility; which must result from an erroneous opinion of excitability. Inflammation is an *error loci*, or an inordinate action, which must (with all other disorders) be preceded by a debility that renders the vessel incapable of controuling their fluids; consequently we are under an equal liability to it, from either of the debilities.

Life is supported by circumstances resting on each other, and the preternatural increase or diminution of either must finally produce the same loss of action or an equal aptitude to disorder.

May I not extend the identity of the debilities farther than the predisposing point, and say that the same disorders may be produced by either.† We have but little more than theory to support this sentiment, as direct debility is seldom suffered to reach the point of irregular or disordered action; unless united or superceded by indirect.‡

* The derangement in the excitability is equal if not the same.

† I have frequently seen epilepsy produced by direct debility, or by a direct and gradual diminution of excitement, without the interposition of fever, and depletion would have produced death.

‡ In describing excitability, this question was noticed.

As it is allowed that the two debilities terminate in an equal diminution of excitement, and that inflammation or inordinate action of any kind is the immediate consequence of that lessened excitement, or incapacity of the vessels to propel or govern their fluids, then must their equal predisposition to disorder, or their identity be also granted.

This identity of debility or unity of disorder, presents the key, by which we may with ease enter those numerous apartments in the temple of medical science, which have for ages required a separate one.

Before I retire from you, gentlemen, permit me to observe, that in approaching the objects of this essay, I have been concise and perhaps irregular, leaving an improvement of the way to others; I may add that I do not expect my sentiments will be readily received, having opposed authors of high and immortal fame, and supported a simplicity, that is hostile to the pride of science.

J. PENDLETON, JUN.

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