On epilepsy: an answer to the question--What is the nature of the internal commotion which takes place during an epileptic paroxysm? / [John Jackson].

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ON EPILEPSY:

AN ANSWER TO THE QUESTION—

WHAT IS THE NATURE OF THE INTERNAL COMMOTION WHICH TAKES PLACE DURING AN EPILEPTIC PAROXYSM?

BY

JOHN JACKSON,
M.R.C.S.E.

"It is the fundamental law of the world in which we live that Truth shall grow, —first the blade,—and then the ear,—and then the full corn in the ear."
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ON EPILEPSY.

THERE are, perhaps, few diseases which are more serious in their effects, or which are regarded as more obscure in their cause, or which have had more attention devoted to them by medical men both ancient and modern, than that of Epilepsy; but yet no satisfactory nor rational reply has hitherto been made to the question—What is the nature of the internal commotion which takes place during an epileptic paroxysm? Some pathological writers have regarded the subject as inscrutable; and so I suspect it is to those who believe, as probably most, if not all except myself do, that HARVEY'S doctrine of the circulation is *perfect;* and that the view generally entertained as to the course taken by the digested food from the alimentary tube into the blood-vessels is *correct*. However startling and heterodox it may appear to those who are in the habit of taking things for granted, and who implicitly believe that what has been taught for two centuries, and they have learned, and perhaps taught others again, must necessarily be true, I nevertheless venture to affirm, and will adduce the requisite evidence in support of the affirmation, that the reason why the nature of epilepsy is not understood, and therefore why its treatment is for the most part empirical, and not conducted on any sound and definite, but vague and unsound principles, is because Harvey's doctrine of the circulation is defective; and does not explain, as it would and ought to if it were not defective, the natural office and action of the part or *vessel* whose disordered action it is that produces the disease. Harvey was the first to comprehend and explain to others the office and action of the parts which constitute the Second or Pulmonic Afferent

Vessel, viz., the right auricle and ventricle of the heart, and the pulmonary artery, and its branches; and which vessel terminates in the pulmonic capillaries, and not only conveys the blood to, but propels it through those capillaries. He was also the first to comprehend and explain the office and action of the parts which constitute the Third or Systemic Afferent Vessel, viz., the left auricle and ventricle of the heart, and the aorta, and its branches; and which vessel terminates in the systemic capillaries, and not only conveys the blood to, but propels it through those capillaries. But he did not comprehend, and therefore could not explain, the office and action of the parts which constitute the First or Hepatic Afferent Vessel, viz., the spleen, and the splenic and portal vein, and its branches; and which vessel terminates in the hepatic capillaries, and not only conveys the blood to, but, as I shall show, propels it through those capillaries—only with a different kind of motion to that which the pulmonic and systemic afferent vessels cause through the pulmonic and systemic capillaries: and further, that it is the disordered action of this same hepatic afferent vessel which gives rise to the hitherto incomprehensible symptoms observable during, and characteristic of, the epileptic paroxysm.

Harvey's doctrine teaches that there are only *two* vascular systems—a pulmonic or "lesser," and a systemic or "greater." It is evident, therefore, that he regarded the hepatic vessels as belonging to, and as being a part of, the systemic, or general system; and not as constituting, which I maintain they do, as distinct, and as complete, and as perfect a system, as either the pulmonic vessels or the systemic; and that there are, consequently, despite his authority to the contrary, *three* vascular systems—an hepatic, a pulmonic, and a systemic; each system consisting of an *afferent* vessel, capillary or *perferent* vessels, and *efferent* vessels. Thus:—

FIRST, OR HEPATIC VASCULAR SYSTEM.

1. Hepatic Afferent Vessel—consisting of (1) the spleen, (2) the splenic and portal vein, and (3) its branches.
2. Hepatic Capillaries, or Perferent Vessels—intermediate between the terminal branches of the hepatic afferent vessel and the primary roots of the hepatic efferent vessels.
3. Hepatic Efferent Vessels—the hepatic veins.

SECOND, OR PULMONIC VASCULAR SYSTEM.

1. Pulmonic Afferent Vessel—consisting of (1) the right auricle and ventricle of the heart, (2) the pulmonary artery, and (3) its branches.

2. Pulmonic Capillaries, or Perferent Vessels—intermediate between the terminal branches of the pulmonic afferent vessel and the primary roots of the pulmonic efferent vessels.

3. Pulmonic Efferent Vessels—the pulmonary veins.

THIRD, OR SYSTEMIC VASCULAR SYSTEM.

1. Systemic Afferent Vessel—consisting of (1) the left auricle and ventricle of the heart, (2) the aorta, and (3) its branches.

2. Systemic Capillaries, or Perferent Vessels—intermediate (1) between the terminal branches of the splenic artery and the primary roots of the hepatic afferent vessel, and (2) between the terminal branches of the hepatic artery and the terminal branches of the hepatic afferent vessel, and (3) between the terminal branches of the systemic afferent vessel generally and the primary roots of the systemic efferent vessels.

3. Systemic Efferent Vessels—(1) the gastro-intestinal or mesenteric veins which terminate in the trunk of the hepatic afferent vessel, and (2) the superior and inferior venæ cavæ, and the coronary vein, and their roots.

From the preceding arrangement of the blood-vessels, and which I take it is the *natural* arrangement, and which I commend to the special attention of the reader, it is clear that Harvey's doctrine of the circulation, which, though nothing was ever more despised at first, physiologists have bowed down to and worshipped for the last two centuries, is, after all, *defective;* and could not well be more so, inasmuch as it takes no cognizance of a whole system; and merely accounts for the motion of the blood through the pulmonic and systemic systems, but not through the hepatic! It therefore contains an error or oversight no less than half the size of the great truth which it developes.

Now, as may readily be conceived, if it be true that epilepsy depends upon the disordered action of the hepatic afferent vessel, it

must be impossible for any one to understand such disordered action, or duly to appreciate its causes and effects, until after he has been made acquainted with the natural office and action of that vessel; and therefore to this part of the subject exclusively it will be necessary to give our best attention in the first place; and before we enter upon the further consideration of the question how the epileptic paroxysm is produced.

The hepatic afferent vessel, as already stated, consists of the spleen, and the splenic and portal vein, and its branches. Or we may say that it consists of the splenic vein and its roots, and the portal vein and its branches. Now, it receives by its extreme *roots* the blood from the capillary terminations of the splenic artery; and by its extreme *branches* the blood from the capillary terminations of the hepatic artery; and by the gastro-intestinal or mesenteric veins which terminate in its *trunk*, it receives the blood from the alimentary tube. But it is not merely the blood which is supplied to the alimentary tube by the gastro-intestinal arteries that the gastro-intestinal or mesenteric veins pour into the hepatic afferent vessel, but along with, and in addition to that blood, *all the drink, and all the digested food;* both of which are absorbed by the gastro-intestinal capillaries. This, however, is not at present the opinion of physiologists. Strange to say, it is believed by many, and indeed by most, that the drink and digested food take *different courses* from the alimentary tube; that the former is absorbed by the radicles of the mesenteric veins, and then proceeds through those veins into the portal vein, but that the latter is taken up by the lacteals, and transmitted by the thoracic duct into the left subclavian vein! Others suppose that the whole of the digested food does not take one and the same course; for, that although "starch," or *bread*, or potato, passes through the mesenteric veins into the portal vein, that "caseine," or *cheese*, passes through the lacteals and thoracic duct into the left subclavian vein! And again, as if one such absurdity were not enough, that although the *fat* of meat takes the former course, the *lean*, or "fibrine," takes the latter! Nothing can be more opposed to reason and truth than such notions; and they are really too absurd to deserve a serious refutation; but still they are at present the received and accredited opinions of physiologists. We have, however, only to compare, or rather contrast, the lacteals with the gastro-intestinal capillaries, the thoracic duct with the gastro-intestinal or mesenteric veins, and the *vein under the left*

collar-bone with the hepatic afferent vessel, to become convinced, if we are capable of conviction, through which of the two courses the digested food, as well as the drink, does pass when it leaves the alimentary tube. In the gastro-intestinal mucous membrane the capillaries are as numerous as they can be, so that the former may be said to consist chiefly of the latter, and therefore they must be far better adapted for absorbing the large quantities of drink and digested food from the alimentary tube than the lacteals, which are only few in comparison, are for absorbing, whether wholly or partially, the digested food alone. Again, the gastro-intestinal or mesenteric veins are much shorter, and more capacious than the thoracic duct, which is only a single tube, no less than a foot and a half long, and of no greater diameter than a "crow-quill"; and therefore they must be incomparably better adapted for transmitting into the hepatic afferent vessel the *pints* of drink, and the *pounds* of digested food* which are daily absorbed from the alimentary tube, than the thoracic duct can possibly be for the transmission into the left subclavian vein of the digested food alone. Lastly, the hepatic afferent vessel is in the abdomen, and therefore in the *same cavity* as the stomach and bowels, and not like the left subclavian vein, at the top of *another cavity*, the thorax; and, consequently, is as conveniently situated for the reception of the digested food as well as the drink from the alimentary tube as the left subclavian vein is the opposite. It is evident, therefore, that the lacteals, thoracic duct, and left subclavian vein, will bear no comparison with the gastro-intestinal capillaries, gastro-intestinal or mesenteric veins, and hepatic afferent vessel, as regards fitness or adaptation for absorbing, transmitting, and receiving the drink and digested food from the alimentary tube. There can be no doubt, therefore, that both the drink and digested food take one course—the broadest, shortest, and most direct; that is, pass from the alimentary tube into the gastro-intestinal capillaries, and through the gastro-intestinal or mesenteric veins into the hepatic afferent vessel; and that the two doctrines—first, the prevailing one, which teaches that the drink goes one way and the digested food another; and secondly, that part of the digested food goes one way

* In many persons it is a matter, not of ounces, but of pounds. Northern travellers relate that the Samoiede consumes as much as ten pounds of flesh daily. And many farm-labourers and others employed in out-of-door occupations in this country, eat daily, and perfectly digest, at least half that number of pounds of bread, meat, and potatoes.

and part another,—are not only erroneous, but actually ridiculous and absurd.

But I may be asked—If the whole of the drink and digested food takes the course just stated, of what use are the lacteals, lymphatics, and thoracic duct? If I were so minded, I might excuse myself, and decline to reply to this question, by saying that my object in this paper is simply an explanation of the natural office and action of the hepatic afferent vessel, and how the disordered action of that vessel produces epilepsy; and that, although I do not affect to be indifferent as to what may be the true function of the lymphatic system, I still consider the question to be one of secondary importance, and which ought not, therefore, to be allowed to divert our attention from the *hepatic afferent vessel.* But as I do happen to have an opinion upon the subject, and as I can state it in few words, I shall do so, lest it should be supposed that I am attempting to deprive the lacteals of a function long since and still attributed to them by physiologists, and without being able to assign to them another and more rational one. It is a well-known fact, that where veins are numerous there lymphatics abound. They accompany the veins; and therefore it is reasonable to infer that they are subservient to them in some way or other; and, as I think, in the following. The veins being thin membranous tubes, very different from the arteries, and the blood fluid, there must necessarily be a constant exudation or filtration of the serous or more watery portion of the latter, or lymph, taking place through the thin coats of the former; and therefore it seems only a wise and natural provision that there should be a set of vessels *smaller* than the veins, and with *thinner* coats, to accompany them, and to receive or take up the lymph which filters through them, and return it again into the circulation at some convenient point. Within the head there are very few lymphatics, because there the veins or sinuses being encased with a dense fibrous membrane (the dura mater), less exudation or filtration of lymph can take place from them than from the veins in other parts; and consequently there being very little lymph to take up, but few lymphatics are required. The reason why the lacteals, which are simply the lymphatic vessels of the abdomen, contain an opaque or milky instead of a transparent fluid, such as it is in the lymphatics elsewhere, may very likely be owing to the gastro-intestinal or mesenteric veins containing a new, raw, and undepurated blood; which they do as they transmit the *ingesta* from the alimentary tube; and that there

consequently exudes from those veins, and is taken up by the lacteals, a liquid which is less clear and pure than that which issues from the systemic veins, and is taken up by the lymphatics in other parts. I think this a more simple, natural, and intelligible view than that which is commonly entertained; and which attributes to the lacteals and thoracic duct an office or function which they are not adapted for, nor equal to, nor worthy of, viz., the transmission of all, or a great portion, of the digested food from the alimentary tube into the circulation. As for the lymphatic glands, I have only to say that I do not believe that they exert any chemico-vital influence on the lymph which passes through them, or that they can effect any change whatever upon it. I think it a gratuitous and not very reasonable assumption to suppose that the lymph *wants mending*. My own opinion as to the use of these glands is, that they are merely the capillaries from which the lymphatic vessels originate. It is certain that the lymphatics cannot originate from nothing; *ex nihilo nihil fit;* nor can they originate from anything else than capillaries. The question, which time will settle, is—Do the lymphatic vessels originate from capillaries here, there, and everywhere; or, as I conjecture, from the capillaries of which the lymphatic glands mainly consist?

We have next to consider what is the real agent which propels the contents of the hepatic afferent vessel, or the new and raw blood, through the liver into the heart. Now the opinion which prevails upon this subject, owing to the blunder (for it is nothing better) in Harvey's doctrine of the circulation, is as erroneous and absurd as the one which is generally held concerning the course taken by the digested food. It is supposed, forsooth, that the propulsion of the blood through the hepatic capillaries or liver is effected, not by the hepatic afferent vessel itself, but by the left ventricle of the heart; or let us rather say, the systemic afferent vessel! A notion quite as unreasonable and unphysiological as it would be to attribute the propulsion of the blood through the systemic capillaries, or general system, to the pulmonic afferent vessel, or through the pulmonic capillaries or lungs, to either the hepatic afferent vessel or systemic; or both. Thus, what with the left subclavian vein on the one hand *receiving the digested food from the alimentary tube;* and the left ventricle of the heart or systemic afferent vessel on the other *propelling the blood through the liver;* the hepatic afferent vessel, and which is the *first* of the three afferent vessels, is, in the estimation of physiologists, a mere nonentity; its office and action

being attributed partly to the one and partly to the other! And this, too, in the middle of the 19th century—two centuries and a quarter after the discovery of the circulation of the blood! And yet the hepatic afferent vessel is on the spot, while the left subclavian vein and left ventricle are afar off. That the first *does the duty* it is perfect folly in physiologists to doubt; but still the latter, the two *non-residents*, have all the credit of performing it!

Now there is one fact, which in itself is a sufficient and convincing proof that the left ventricle, or systemic afferent vessel, does not propel the blood through the liver. It is this. Owing to the drink and digested food proceeding through the gastro-intestinal or mesenteric veins into the hepatic afferent vessel, much more blood passes into that vessel, and out of it through the hepatic capillaries, than the systemic afferent vessel propels through the capillary terminations of the splenic, hepatic, and gastro-intestinal arteries. Now, no matter how great the propulsive force of the systemic afferent vessel may be—even if it were, as an Italian physiologist, Borelli, absurdly estimated it, equal to 180,000 lbs., or about 80 tons!—it could not possibly, by propelling a certain quantity of blood through the last-mentioned capillaries, expel a greater quantity from the hepatic afferent vessel, and so effect its propulsion through the hepatic capillaries and the hepatic veins. In other words, the systemic afferent vessel, by propelling, say one ounce of blood through the capillary terminations of the splenic, hepatic, and gastro-intestinal arteries, could not cause ten or twelve drachms of blood to flow through the capillary terminations of the hepatic afferent vessel; and yet it would have constantly to perform this physical impossibility if it were the agent by which the propulsion of the blood through the liver is effected. It cannot propel one single drop more blood through any of the systemic veins than it propels through the corresponding arteries; and therefore, as more blood, and much more too, does pass through the gastro-intestinal or mesenteric veins, than through the gastro-intestinal or mesenteric arteries, the systemic afferent vessel cannot be the sole agent in propelling the blood even through those veins; much less, then, can it propel the blood through the hepatic capillaries. The motion of the blood through the gastro-intestinal or mesenteric veins is probably due, partly to the vis à tergo of the systemic afferent vessel, partly to the pressure to which they are subject during inspiration, but perhaps chiefly to the contractility of the veins themselves.

As the systemic afferent vessel cannot propel the blood through the capillary terminations of the hepatic afferent vessel, the latter must needs do its own work, and effect that propulsion itself. And it is no less certain that the hepatic afferent vessel can and does propel the blood through the hepatic capillaries, than it is that the pulmonic afferent vessel propels it through the pulmonic capillaries, or than that the systemic afferent vessel propels it through the systemic capillaries. It is true the hepatic afferent vessel is not *like* the pulmonic and systemic afferent vessels; that is, it does not consist, like each of them, of a heart, artery, and branches, but of a spleen, vein, and branches. And why? Because it has to produce a *different*, in fact a precisely *opposite* kind of motion of the blood through the hepatic capillaries to that which they produce through the pulmonic and systemic capillaries; that is, an intermittent and slow motion, and not a constant and rapid one. The pulmonic afferent vessel, by the rapid and frequent and powerful contractions of its ventricle, and the elasticity of its artery and branches, causes a constant and rapid motion of the blood through the pulmonic capillaries: and the systemic afferent vessel being of similar construction, causes, by a similar action, a constant and rapid motion of the blood through the systemic capillaries: but the hepatic afferent vessel, which is *venous* throughout—roots, trunk, and branches—being highly distensible, and in the same ratio contractile, cannot be distended quickly, or contract rapidly. Its distension and contraction must be alternate, and both of them gradual and slow; and consequently the motion of the blood through the hepatic capillaries to which its contraction gives rise cannot be constant, as it is through the pulmonic and systemic capillaries, and must therefore be intermittent; cannot be rapid, as it is through those capillaries, and must therefore be slow. While the hepatic afferent vessel is distending by the inpouring of blood into its roots, trunk, and branches, there can be no motion of the blood through the hepatic capillaries; but during its contraction a slow motion of the blood through those capillaries is necessarily produced.

Now, if a constant and rapid, instead of an intermittent and slow motion of the blood through the capillaries of the liver had been necessary, it is evident that the hepatic afferent vessel must have consisted, not of a spleen, vein, and branches, but of a heart, artery, and branches; and the gastro-intestinal or mesenteric veins would have terminated in the auricle. On the other hand, if an inter-

mittent and slow, instead of a constant and rapid motion of the blood through the capillaries of the lungs had been necessary, the pulmonic afferent vessel must have consisted, not of a heart, artery, and branches, but of a spleen, vein, and branches; and the superior, inferior, and hepatic cavæ would have terminated in the trunk of the vein. And again, if an intermittent and slow, instead of a constant and rapid motion of the blood through the capillaries of the systemic or general system had been necessary, the systemic afferent vessel must have consisted, not of a heart, artery, and branches, but of a spleen, vein, and branches; in the trunk of which vein the pulmonary veins would have terminated. For the three afferent vessels we should then have had one heart, and artery, and branches—hepatic; and two spleens, and veins, and branches—pulmonic and systemic: and not, as now, one spleen, and vein, and branches—hepatic; and two hearts, and arteries, and branches—pulmonic and systemic. And this is in accordance with, and is no unapt illustration of, one of the first principles of philosophy, viz., that "opposites placed together give light to, and explain each other." The hepatic afferent vessel, consisting of a spleen, vein, and branches, is the opposite, or, so to speak, the *anatomical antithesis* of the pulmonic afferent vessel, which consists of a heart, artery, and branches; and also of the systemic afferent vessel, which likewise consists of a heart, artery, and branches; and therefore it is that the hepatic afferent vessel produces a diametrically different physiological effect to the pulmonic and systemic afferent vessels: the former effecting an intermittent and slow, and the two latter a constant and rapid motion. Now, "it is a maxim of the schoolmen, that '*contrariorum eadem est scientia*': we never really know what a thing is unless we are able to give a sufficient account of its opposite."* It cannot be admitted, therefore, that those physiologists "really know" what the pulmonic and systemic afferent vessels are, or that they understand the two hearts, and arteries, and their branches, who are unable to "give a sufficient account" of the hepatic afferent vessel, or of the spleen, and vein, and its branches! But unfortunately for science, and still more so for those subject to epilepsy,—for, as has been well said, "*the interests of science and those of humanity are one*"—it is not the office and action of the hepatic afferent vessel which physiologists seek to understand, but of a

* Mill's System of Logic, vol. ii. p. 339.

part of that vessel only—the spleen. If I may be permitted to draw the comparison, it is as if they did not care to know the construction and action of a gun, but only of the gun-stock; not knowing that it is a gun-stock either. The whole gun complete, stock, lock, and barrel, they disregard. They seem to have no notion that such a thing exists, or that it can be loaded and discharged, or overloaded, and then go off, and knock down, and even kill its owner! Their curiosity about it is limited to the stock, its least important part; and the question which they ask of each other, and which they wish to have solved is,—not what is the use or action of the gun, and what are the accidents to which it is subject, or to which it may give rise,—but what is the use of the stock? Now, to ask what is the function of the spleen, not knowing that organ to be, or not regarding it as, a part, the commencement or roots of the hepatic afferent vessel, is just as absurd and ignorant a question as it would be to ask what is the use of a gun-stock, not knowing it to be, or not regarding it as a part of a gun.

Understanding then now the office and action of the hepatic afferent vessel as well as of the two other afferent vessels; that is, knowing that it receives by its roots the blood from the capillary terminations of the splenic artery, and by its branches the blood from the capillary terminations of the hepatic artery, and by the gastro-intestinal or mesenteric veins which terminate in its trunk the digested food, and the drink, as well as the blood from the capillary terminations of the gastro-intestinal arteries; and knowing also that it propels this admixture of blood, drink, and digested food, which is the new or raw blood, through the liver into the heart with an intermittent and slow motion; we are now, which we never were before, in possession of the requisite knowledge to enable us to comprehend the internal commotion which takes place during an epileptic paroxysm, and to understand the manner in which it is produced. If we say to a person subject to frequent attacks of this disorder, "lay your hand on the part where you most frequently experience pain," the chances are that he or she, as the case may be, will place it on the left side of the stomach, over the spleen.* And, in addition to this pain in the spleen, I find it is no uncommon thing for a considerable swelling of that organ to exist also; and

* This is not a constant or invariable symptom, though a very common one.

which is always largest just before a paroxysm, but cannot be detected immediately after it; that is, it disappears during it. One patient, a young female, said this swelling was sometimes as large as "a bustle"—a thing of which I have no very definite idea—but such was her comparison. She also remarked, that when it was thus large she knew it would not be long before she had a fit; but that no trace of the swelling was ever discoverable after the fit. What happens, then, in an epileptic paroxysm? The hepatic afferent vessel—roots, trunk, and branches—having lost its tone, gradually, and during the interval between the last attack and the one approaching, becomes unduly and even excessively distended. Hence the two significant symptoms just noted—the splenic pain and swelling. Then the distended vessel, stimulated by the undue distension, or from the influence of fright, or other mental emotion, contracts suddenly and with undue force. The consequence is an inordinate rush of blood through the liver into the heart, and which, meeting the current descending to the heart by the superior cava, arrests it, and prevents its ingress into the auricle. That this is what really occurs is well borne out by the fact that great dilatation and even rupture of the right auricle have been found after death from epilepsy. Now the effect of this prevented ingress of blood into the heart by the superior cava is, while it lasts, and that is during the paroxysm, that the motion of the blood through the brain, spinal cord, and organs of sense, is prevented; and this gives rise to the two chief and characteristic symptoms of the disease, *insensibility* accompanied by *convulsions:* the former being owing to the arrested motion of the blood through the brain, and the latter to its arrested motion through the spinal cord. Moreover, as the blood from the exterior of the head, and from the face, neck, arms, and parietes of the thorax, also returns to the heart by the superior cava, the motion of the blood through them is arrested too; and this accounts for the lividity and turgescence of the face and hands, and for the distension, often excessive, of the veins of the forehead, neck, and arms;* symptoms which, as they require some little time for their development,

* I recollect an epileptic the principal veins in whose arms were nearly as large as an ordinary-sized finger. This great dilatation was doubtless owing to the repeated and excessive distension to which they, in common with the other tributaries of the superior cava, had been subject during numberless paroxysms.

are more evident towards the end than at the commencement of the paroxysm, and could not exist during it if the descending current could obtain its accustomed ingress into the auricle. Nor is there any other conceivable or possible way in which this temporarily prevented ingress could be produced, and which certainly *is* produced, than by an over-distended hepatic afferent vessel contracting, and so causing an undue rush of blood to take place through the liver into the heart.

If this be the true rationale of epilepsy—and certainly this view of its nature accounts for and explains all the leading facts or symptoms connected with the disease—and which is as strong an argument in its favour as could well be adduced, inasmuch as it is always held to be a conclusive proof of the truth of a theory when all the relative phenomena are in harmony with it,—if, I say, epilepsy be produced in this way, the next and most important question is—What principle of treatment can be deduced from it which ought to guide and direct us in our endeavours to prevent the recurrence of the paroxysm? It is of little use our knowing what happens in an epileptic seizure if we are not thereby enabled mentally to perceive, and practically to adopt, those precautionary measures which are the best calculated to prevent it; and, if we have no true principle to act upon, every step in the treatment of the disease is taken in the dark, and is empirical, hap-hazard, and unsafe, and quite as likely to increase the frequency of the paroxysms as the contrary. The principle which I have to propound, and which I beg leave to submit to the consideration of those who may fall in with the foregoing views, is the following: by suitable dietetic and medical treatment endeavour to restore the tone and prevent the undue distension of the hepatic afferent vessel; for, so long as this undue distension can be kept in abeyance, or prevented from reaching a certain point, it is impossible that the paroxysm can recur. The length of the interval between the paroxysms denotes the time which it requires for this degree of undue distension to take place. If the intervals are short it is a proof that it is quickly and we may suppose easily produced; and if they are long, that it is produced slowly, and not so easily. It is not, however, the first link in the chain of causation. The loss of tone is the first, and the undue distension is the second; the third is the sudden contraction; the fourth is the inordinate rush of blood through the liver into the heart, flooding, and even forcibly

distending its right cavities, more especially the auricle; the fifth is the prevented ingress into the auricle by the superior cava; the sixth and last, and which gives rise to all the symptoms observable during the paroxysm, is the arrested motion of the blood through the brain, spinal cord, and organs of sense—exterior of the head, the face, neck, arms, and parietes of the thorax. Now, the only links in this chain which we can possibly influence by *treatment* are the two first. We *may* succeed in restoring the tone of the vessel, and if so, we cure the disease; or, which is much the same thing, we *may* succeed in preventing its undue distension, and then the paroxysm cannot happen: or we may only retard it, and then the intervals will be longer, and the paroxysms less frequent. But if this undue distension be permitted to attain to a certain degree, or if it takes place in spite of all our efforts, the subsequent contraction of the vessel, and its consequences, are inevitable. Our duty, therefore, is plain, and is expressed in the principle already defined. Nor shall we, in attempting to carry out this principle, be aiming at impossibilities. That a restoration of tone to the hepatic afferent vessel, and the prevention of its undue distension, are possible *accidents* even, and therefore not impossible *achievements*, is proved by the fact that a certain though small proportion of persons subject to epilepsy do recover from it. This is most encouraging, because it shows that the disease is not necessarily, and in its nature, like too many others, incurable; although it is too true that hitherto the great majority of patients have not been cured. But when we come to consider that epilepsy depends upon the disordered action of a vessel, the natural office and action of which, although of the greatest possible importance, have not been at all understood; and that it was, and is, utterly impossible for any one to comprehend the former until after the latter; and therefore, disguise it how we may, that hitherto the disease has been ignorantly tampered with; and that medical men, in undertaking its treatment, have actually been guilty of the folly and absurdity of striving to prevent a certain particular occurrence from taking place of the true cause and mode of production of which they have not had even the most remote knowledge nor idea; I say, when we come to reflect on these evident and undeniable facts, and very humiliating facts they are too, we need not feel at all surprised at the small amount of success which has hitherto resulted from the medical treatment of epilepsy. No: the

wonder is, not that medical treatment has generally failed in curing or preventing epilepsy, but that it has ever succeeded. Such effects as the restoration of tone to the hepatic afferent vessel, and the prevention of its undue distension, were not very likely often to proceed from, or be produced by, the remedial measures against epilepsy devised or adopted by those whose faith—for surely it could never have been their reason—induced them to teach and believe, and cherish the *still prevailing doctrine*, that "the thoracic duct is the inlet of the fresh nutritive materials derived from the digestive process;" or, in other words, that a man's dinner passes from his small intestines through a tube a foot and a half long, and of the diameter of a crow-quill, into a vein situated under his left collar-bone!

The observation may seem trite, but it is none the less true, that before we can expect to hit any particular mark, except by the merest chance, we must aim at it, and point straight too; but hitherto it has not been possible to take aim at the right mark in the treatment of epilepsy, because it has never before been in sight. Between it and our mental vision have been four dark clouds in the shape of so many erroneous doctrines. *Error, errori, errorem imposuit.* The first, that the spleen is an organ complete in itself, performing some mysterious and incomprehensible function; and not simply a part, the commencement or roots, of the *hepatic afferent vessel.* The second, that it is the left subclavian vein which receives the digested food from the alimentary tube, and not the *hepatic afferent vessel.* The third—a worthy companion to the last, "*par nobile fratrum*"—that it is the heart which propels the blood through the liver, and not the *hepatic afferent vessel.* The fourth and last, that epilepsy may be produced by irritation of any kind in any part—in the brain, spinal cord, or some of the nerves; in the stomach, intestines, or liver; or in the urinary or generative organs; but not by the undue distension and disordered action of the *hepatic afferent vessel.**

Now it has been well said, that "error chiefly becomes formidable from its concealment, and a detection of falsehood generally dispels its charm." If so, in due time, these four errors will be exploded, and the four corresponding truths established in their stead. And

* "A frequent similar effect argueth a constant cause, and not a variety of causes."—PROVERBIAL PHILOSOPHY.

then, and not till then, will medical men treat epilepsy on something like rational or common-sense principles; and then, and not till then, may we hope that it will cease to be amongst the *opprobria* of medicine; and that instead of the failure of medical treatment being the rule, and success the exception, as is the case at present, the contrary will obtain;—"a consummation devoutly to be wished."

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THE END.

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