

**Essay on the use of the spleen : with an episode of the spleen's marriage, a physiological love-story / by Patrick Black.**

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ESSAY  
ON THE  
USE OF THE SPLEEN

WITH AN EPISODE OF

The Spleen's Marriage, a Physiological Love-Story

BY

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PHYSICIAN TO ST. BARTHOLOMEW'S AND CHRIST'S HOSPITALS



LONDON  
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1876

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1851

USE OF THE STEEL

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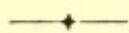
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## PREFACE.



MY OBJECT in this little Essay is to maintain, in opposition to some physiologists, that Nature has acted not unwisely in endowing her creatures with a Spleen ; and also to vindicate her judgment in having placed him, with a view to his marriage, in the position where he is always found—i.e., surrounded by his family relations, instead of hanging him as an appendage at the end of the nose, where he could have discharged quite as well all the functions these philosophers have assigned to him.

For a short time — very short — I indulged the idea that these few remarks might be read before one of our learned Medical Societies ; but reflection soon convinced me that this might not be.



In the first place, the subject was far too uninteresting, too unimportant, to occupy their valuable time. Who indeed cares about the Spleen, or would take the trouble to listen to anything that might be said on the subject? Has he not been cut out of the body hundreds of times, after the most approved method of settling physiological questions? Has he not as frequently been proved to be utterly useless or superfluous?<sup>1</sup> Why then bring his dead carcass out of that tomb of physiological oblivion, to which he has been so long and so justly consigned? Let him live, if indeed he be allowed to live, to please the fancy of the poets, for whom alone he seems to have been created. Surely they will gladly take him over from the willing hands of the philosophers, and be merry over his true function, which they alone have had the good fortune to discover.

<sup>1</sup> In universum per hæc experimenta conficitur, animalia vulnus absque vitæ jacturâ passa porro vixisse absque conspicuo incommodo per annum et ultra : etiam homines. Catellas porro peperisse, pingues fuisse canes, lætosque et voraces ; etiam plethoricos. —Haller, tom. vi. p. 421.

Demum desperabundi aliqui et pro inutili habituri cujus utilitatem ignorabant, esse inutilem et ignavum, &c.—P. 426.



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These reasons seemed to be sufficiently deterrent, but, in the second place, others of even greater weight claimed to be heard.

A writer must sometimes put himself in the position of the Roman satirist, who had no sooner penned his first line,

O curas hominum ! O quantum est in rebus inane !

than he tried to look at it through the eyes of another, doubting whether it would suit the public taste, when he heard his inward monitor say to him 'Quis leget hæc?'—with other words of discouragement.

So, when I had almost completed my little task, similar thoughts began to move me, and I was inwardly advised that, whatever of originality I knew it possess, or of merit, which with paternal complacency I alone might think it possessed, that these could not atone for the faults of dress or manner in which my thoughts had been clothed or put together. 'You must re-clothe your thoughts, the monitor said, 're-write your essay ; in your own peculiar physiological language, you must "defi-



brinate" it—you may not indeed be aware of it, but to others the fact will be painfully obvious—you have been sporting in serious purlieus—Heaven cease this idle humour.'

Resenting the imputation, I answered, 'I am not open to your reproach, but, though ready and even willing to accept your conclusion, I will not alter my language to please any man. What I have written shall stand—the title of my Essay shall be:—

‘THE MARRIAGE OF THE SPLEEN:

A PHYSIOLOGICAL LOVE-STORY.’

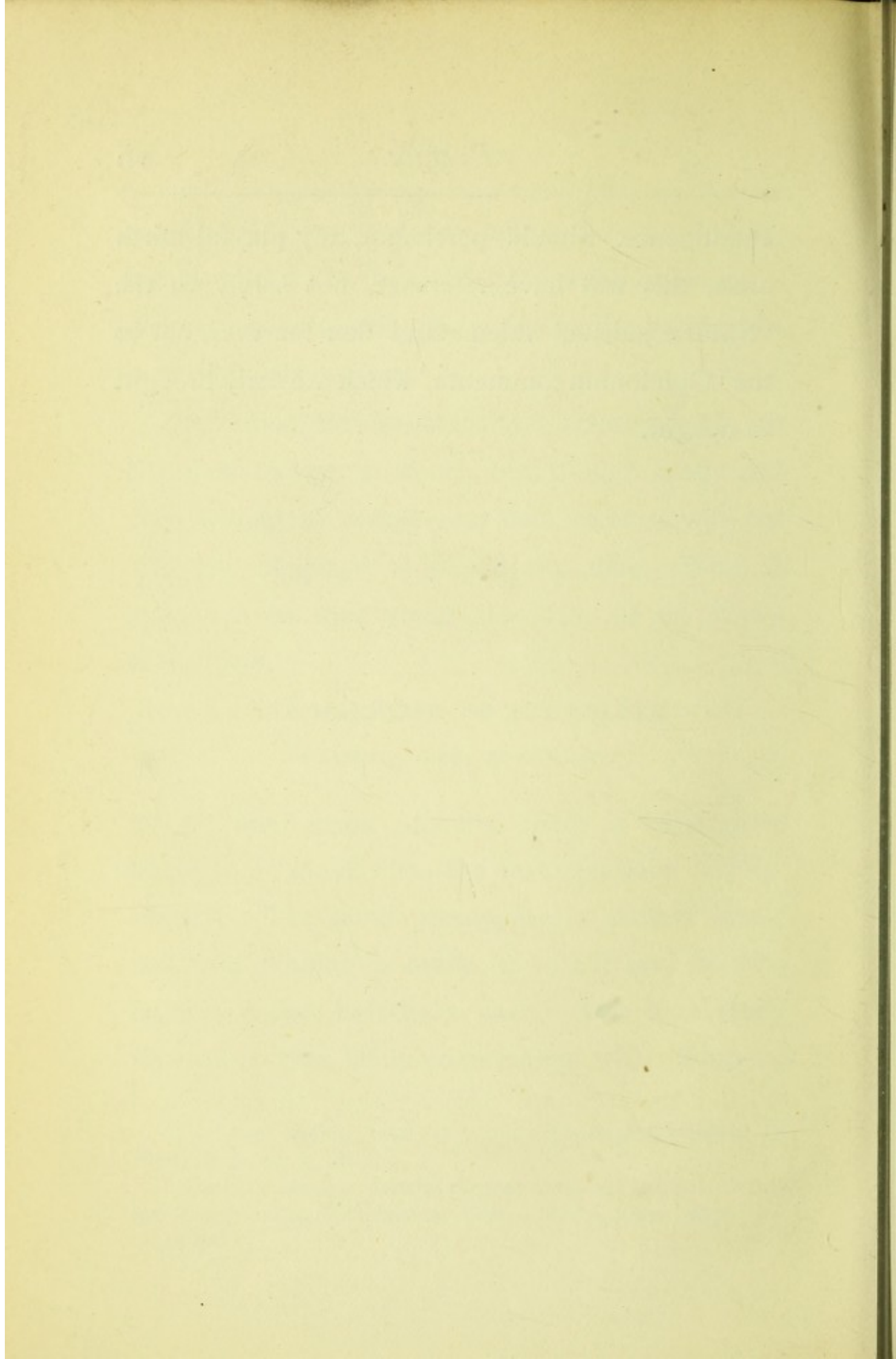
Of all intellectual pursuits, there is none more noble, more grave, than the investigations of Physiology. The mind presupposes a perfect ideal,<sup>1</sup> and that nothing is made in vain;<sup>2</sup> and he who humbly aspires to take a part in this high study must feel that he is communing with Supreme

<sup>1</sup> Naturam omnia justè et artificiosè peragere.—Galen, De Natural. Facult. c. xii. l. I.

<sup>2</sup> Inutilem aliquam partem corporis esse, tam latè per diversas species regnantem, indignum est dictu.—Halleri Elem. Phys. tom. vi. p. 426.

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Intelligence. Should, perchance, any playful mirth arise, this will have reference, not surely to the 'Naturæ judicia,' which stand fast for ever, but to the 'Opinionum commenta,' which are daily brought to nought.





THE  
USE OF THE SPLEEN.

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IT WILL, I think, be generally allowed, that whatever thought has hitherto been spent on the discovery of the Spleen's function has proved unfruitful.

There has, in truth, been no lack of labour or of interest in the subject; it has engaged alike the attention of the physiologist and the student in pathology; yet their efforts have been of little or no avail, and it will scarcely be denied that the 'use of the Spleen' must still be regarded as an unsolved problem.

It may be, perhaps, that our knowledge is in too rudimentary a state to enable us to grasp it, and that much intermediate but still hidden knowledge must be won before we reach that point, when the dark problems of the present shall at once disclose themselves in the clear light of day.



This may indeed be the case, still we cannot fold our hands, and practically accept such a conclusion; we must press on, with such imperfect knowledge as we possess—take another turn in the labyrinth, when the last has brought us to a standstill;—and still persevere in the hope that our labour will at length be rewarded.

Before offering to others some thoughts which have often occurred to myself, I would crave leave to say, that it has never appeared to me that the investigations which have been made at various times, whether at home or abroad, proceeded on any definite principle. There has been no want of high ability, no absence of ripe knowledge, but withal no guiding idea. A few philosophers have met together, and made the following arrangements. One is to bring his lens or microscope; the chemist his bottles and test-tubes; the pure anatomist his injecting-pipes and fine instruments; may I add to these the vivisector with his rabbits from Leadenhall Market? They meet and confer.—‘It will be hard indeed,’ they say, ‘if we don’t strike out something amongst us.’ Yet, with all this fine ability, these great resources, and high promise,



they have to bear this hardship—they stumble upon nothing; their work, though varied and ingenious, has been infructuous; they conclusively establish many negations, and they record them all in a report, which, though deemed a model of philosophic inquiry, is one, nevertheless, in which they have only to inform the world where they have *not* found the object of their research.

One great error, which, as it seems to me, has stood in the path of successful inquiry, is this—that the Spleen has been too much considered in itself, or in a falsely-assumed analogy to the so-called ‘ductless glands,’ instead of in its primary relation to that system, of which it forms so large and, therefore, so important a part; and then secondarily in its relation *through this* to the rest of the body.

Let us, then, look at the Spleen from this new point of view—let us forego for the moment our fine dissections and microscopic observations, and consider it in its simple relation to that system which constitutes the Vena Portæ; and, indeed, if we should find that it plays an important part here, we shall direct no arguments to the second issue,



i.e. its relation to the rest of the body, for that will be already established by the first.

If the Spleen has any special relation in Physiology to the Vena Portæ, this will be its relation to the rest of the body :—if it plays any important part in the body as a whole, it will be through its intervening function, as a part of the portal system.

Is this proposition, or are these propositions, clear, even self-evident? If not, I must endeavour to make them so.

The Spleen is an universal organ,<sup>1</sup> and always maintains the same anatomical relations: that is, wherever there is a Spleen, there is a portal system; and the converse proposition is equally true, the portal system demands the presence of a Spleen.

Has there ever been a Spleen which returned its blood into the Vena Cava, like the kidneys? I answer, 'Never,' but why should it not do so? No physiologist, with our existing knowledge, could flout the idea, even though Nature's facts altogether bar the conception.

I ask the question in order to point attention

<sup>1</sup> Avibus, quadrupedibus oviparis, piscibus lien est.—Haller, tom. vi. p. 385.



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to the Spleen's peculiar position ; and, this being established, I add, 'Does any issue hang on these anatomical relations? Or shall we be indifferent to the fact whether its copious streams, like those of the emulgent veins, are returned into the Vena Cava, or constitute an important part of the portal system?'

There can be, I think, but one answer, but this still requires some elucidation.

It is allowed by physiologists that the nutriment of our bodies comes in by two gates: one of these is the system of the lacteals—the other is that of the gastric and mesaraic veins. We pass by the first, which, though all-important, is impertinent to our present inquiry. It is the latter which now demands our attention.

The most cursory view of the circulation presents us with this important fact—that the organs of digestion must stand on an altogether different basis from the rest of the body ; and this would lead us to think that where there is any great difference in one respect, it might not be unreasonable to expect that there should be some adjusting or balancing power which might have



special reference to this exceptional requirement, and thus help its due accomplishment.

Now the blood, which is distributed to all other parts of the body, has comparatively simple functions to perform. To carry oxygen and albumen, or whatever else may be required for heat and nutrition, and to bring back carbonic acid and other products of disintegration, may perhaps express the chief ends that are effected; but the blood which is conveyed to the digestive organs not only performs all these functions, in common with that supplied to other parts, but it assumes this great additional duty—it returns *laden* with *new material*; and, being invested with this high function, does it seem strange that, when thus suddenly charged with the crude material of digestion, Nature should think fit to dilute it with streams gathered from another source?—that she should have placed an organ in the way expressly fitted to meet these exceptional conditions, and thus prepare the Blood by dilution for the refining operations of the Liver?

Is not this an issue which hangs on the Spleen's anatomical relations? Does not the splenic blood



largely dilute that which is returned from the whole digestive tract? Is not this *an* use, and, if so, *the* use of the Spleen, until anything be shown to the contrary?

That the Spleen performs this office is obvious—as a fact it cannot be called in question—does legitimate hypothesis affirm its value?

I repeat the question—why does it not give its blood to the Vena Cava like the emulgent veins, unless it had a special relation to the Portal System—a relation which is universal in every animal which possesses a portal system?

The Spleen's physiological use is the direct inference from its anatomical relations, and fair hypothesis endows it with philosophic sanction.<sup>1</sup>

Let me give an illustration of my meaning. Think of our Court of Aldermen sitting down to dinner at the Mansion House. They begin with turtle and iced punch; this is followed by a dinner of six courses, with wines 'still' and 'sparkling,' every five minutes, for the space of about two hours; the whole is concluded with copious libations of port-wine.

<sup>1</sup> In omnibus, nisi plurimum fallor, animalibus sanguis lienis in hepar venit.—Haller, tom. vi. lib. xxi.



Is it of no consequence whether these gentlemen take their spleens with them to the banquet or not? In your own case, would you, physicians in high practice, and professors of physiology—would you entrust your portal system to take so much of this rich material direct to your Liver, before it was well watered by your Spleens; or would you consent to an alternative (which *in foro scientiæ* would be no alternative at all), that of letting your Spleen send its recurrent blood into the cava, instead of joining the confluence of the mesaraic veins? I trow not. But why this answer? No present physiology forbids it. Your Carpenters and Huxleys, your Bernards and Virchows, will offer no objection. The Spleen, they will tell you, will make as good a ‘birthplace,’ or ‘slaughter-house’ (you have your choice), for red or white corpuscles, in the one case as in the other.

Let us, then, for argument’s sake, take it as the ‘birthplace’ of these bodies, which is the opinion of some.<sup>1</sup> Would it not appear somewhat strange that this young and interesting brood of corpuscles, to which the Spleen has just given birth, should be

<sup>1</sup> Müller, Kölliker, and others.



sent into such a foul nursery as the Liver, whose primary business is altogether of a cleansing and purifying nature? Shall Nature say to these bantlings, 'Go and befoul yourselves with bile, and then, when you have had your lark in the mud, come into my service, and discharge your appropriate functions—the functions I have assigned to you'? Would she not rather say, 'I will take you, my children, fresh from your birth. You shall come at once into my Vena Cava, a channel well fitted to receive you. I will not send you to swim in the dirty streams of Pactolus, rich and valuable though they be. Your presence there would only hinder that great river in his bounteous mission, and impede the functions of that noble organ the Liver, whose business it is to refine his golden sands'?

Or let us, with others, regard the Spleen as the 'slaughter-house,' or 'grave,' of the same beings. Would it be in this clumsy, roundabout fashion that Nature would discharge her useless, effete matter? Would she not expel them forthwith, instead of sending them through the Liver, where they could only hamper and obstruct? Or, let us



regard the Spleen in the double capacity of both a 'creator' and a 'destroyer'—a being like the mythic Saturn, who devoured his own children. Would not the objections we have offered to each of these, singly, apply to both when thus fused together?

I do not, in asking this question, presume to put limitations on Nature's multifarious operations, nor to dictate in what manner she shall accomplish her great ends. I would say, with a great German physiologist, 'Nunquam facilè speravero Naturæ sapientiam me totam perspexisse ;' but here I am only meeting hypothesis on its own ground—i.e. suggesting a counter-hypothesis, and asking in which direction Nature's analogies seem to point.

These fancies just referred to may be thus described. They are :—

*Bellæ hypotheses, artificiosè fabricatæ, et eleganter concinnatæ : leviusculis autem suffultæ rationibus, mentem paulisper titillant, et gaudio quodam afficiunt.*

We may, indeed, be pleased with such feathers, or tickled with such straws ; but do they afford us any true, any scientific satisfaction? Above all, will they permit us to give our consent (which, if



we accepted them, we might freely do) to our splenic blood being returned into the 'cava,' instead of joining the confluence of Pactolus' streams?

Why should I attempt an enumeration of all the views that have been presented to us of the Spleen's natural functions, as well as of its place in pathology? Have they not all been gathered up and recounted in Mosler's work on Leucæmia? Still, the ardent zeal which has been displayed by some inquirers would leave me without excuse were I to pass them over altogether in silence.

Müller's view was that which assigned to the Spleen the function of the continuous formation of free colourless blood-corpuscles, and their constant introduction into the blood.

I have already offered some objections to this, and would only add that to give it any differential value, it would be necessary to examine not only the arterial and venous blood of the particular organ in question, but also that which was supplied to, and returned from, every other organ at the same time.

Dupuytren—not yet, I presume, the eminent surgeon, but a rising young professor of the École



Pratique—is certainly entitled to some notice. We may suppose some of his youthful companions thus addressing him—‘Dupuytren, à quoi sert la Rate?’ He would shrug his shoulders, more Gallico, the meaning of which we all know, and would add, ‘Cut it out, and watch the result.’ They did this, accordingly, and repeated it even to the fortieth time. Only half of the animals thus experimented on died. Those that recovered began to show, about the third week, some symptoms of returning appetite, which, compared with their total indifference to food during the febrile period of their peritoneal inflammation, might perhaps be fairly designated as a state of ‘remarkable voracity.’ This, however, is all the philosophy that was cut out of those forty dogs.

Vivisection, from which we might hope for so much, is not without its discouragements—not, indeed, to the vivisectors themselves, for defeat only redoubles their ardour. Like Cato, as complimented by Lucan, they perhaps prefer the ‘victa causa’ to that which is crowned with success.

*Victrix causa Deis placuit, sed victa Catoni.*

The work of Schultze is next entitled to honourable



mention. Though less meritorious than that of Dupuytren, being in the proportion of 27 to 40, it was more successful in its results—not, I mean, in gifts to science, but in the immediate fate of his victims; for out of the twenty-seven dogs and other animals he operated on, only one died, a result ascribed by him to an accidental fault in his operation. Still, the sole fruit of his labour was, that he observed—1, diminished fecundity; and 2, frequent choking and vomiting *after* a hearty meal.

Führer and Ludwig (brothers in science) were, perhaps, discouraged from prosecuting their labours by the death of three out of four dogs operated on. They found, as did many others, what might be expected from acute peritoneal inflammation—some enlargement of the mesenteric glands.

Passing over Czermak, Quittenbaum, Hyrtt, and others, I must not be silent in regard to Bardeleben, who, finding that the removal of the Spleen alone did not always prove fatal, conceived the brilliant idea of uniting with the Spleen's excision the removal of the thyroïd body—hoping, perhaps, that, as disappointment only awaited the loss of one of these organs, some 'tertium quid'



might arise out of the combination of the two. It does not appear why he should have selected the thyroïd body; and we are only left to conjecture that it was from an assumed analogy, connected with the fact of their being both ductless organs.

This enterprising physiologist found no change in any of the organs, and believes the only effect of removal of the Spleen to be increased liability to watery effusion into serous cavities, which is still greater when the thyroïd body is removed as well as the Spleen. Hence the function of the Spleen, according to Bardeleben—whether we take it singly, or in conjunction with its ‘Scotch cousin,’ the thyroïd—would be ‘to keep the body dry.’

The views of Schiff are ingenious, but fanciful; and his ‘Peptons’ and ‘Parapeptons’ are so mixed up with the pancreas, and, as far as I can see, so opposed to anatomical arrangements, that I shall not pretend to offer any remark on them. It is, besides, unnecessary that I should do so, as both his facts and reasonings have been contradicted by others, including Lusanne, Schindeler, and Mosler.



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One of his conclusions may appear somewhat strange, which is this—‘The assimilation of fat is favoured by the removal of the Spleen ;’ and he appeals to the practice of English butchers, who (he says) remove the spleen from calves in order to fatten them !

How such an extraordinary idea could have entered his head, it is difficult to imagine ; nor is it necessary to say that such a thing has never been done in the history of man, nor that for such an object it will ever be attempted. Possibly he may have confounded the practice of ‘spaying’ pigs with an operation to which, from repeated practice, his mind had become so familiar, that it was impossible to disengage it ; and the two words, ‘Spleen’ and ‘Spaying,’ having the same initial consonants, would at once be laid hold of by his mental ‘Peptons,’ dissolved and digested by the pancreatic juices of his intellect, and finally incorporated with his whole mental fabric.

Will genius wholly excuse superlative credulity, or a wild imagination ; and must we acknowledge that there is much truth in the saying, ‘It requires a very clever man to be a thorough dupe’ ?



Alas! poor Spleen! what indignities, nay, what martyrdoms has he not suffered!

Diis ille adversis genitus, fatoque sinistro.

Pass we now from these horrors, not more sickening than irrational, and endeavour to pursue our subject along the course in which Nature, i.e. Anatomy, is striving to lead us: for this should always keep us on the true scent, whatever red-herring may be trailed across our path.

In a former page (14) I made use of an argument to which I failed, perhaps, to give its due weight. It amounts, indeed, almost to this—that there is an *à priori* probability in favour of a Spleen's existence before we make the discovery that Nature has actually given us one.

Where extra work is required, an additional hand may be needed. The mesaraic and its tributary veins are performing this extra work: they are bringing in 'new material,' and should the help<sup>1</sup> which is needed come before us under a somewhat strange and questionable shape, let us not accost him in the language that Hamlet addressed to his

<sup>1</sup> Help—not to gather, nor to carry, but to winnow.



father's ghost, but accept him with due courtesy in the guise in which Nature has presented him.

I might here, perhaps, make my meaning somewhat clearer by an illustration.

Let us suppose we were travelling in some planetary world, where we were utterly ignorant of the manners, customs, and language of the people. In this, our 'Voyage dans la Lune,' our journeys are supposed to be made in two-horse coaches, which for a long time seems to be the invariable practice. At one stage, however, where, in addition to the usual load, several sacks of flour have to be conveyed from the miller's to a bakehouse some eight miles on the road, they tack on a mule as a leader, and with this help everything goes on satisfactorily. Meanwhile we, as philosophers (call us 'moon-struck,' if you like), are much interested in this novel and unexpected proceeding; and we follow up our 'Pickwick' observation with a good deal of speculation of the same warp and woof. We are purblind to the sacks of flour, though we saw them taken up, when they were lying under our noses on the road; and, though one of our party somewhat timidly alluded to them, we snubbed him



at the instant, and sent him 'to Coventry' for his shallow impertinence. 'No, sir, it is the mule who interests us. Do you not see that he is a being altogether *sui generis*? Let us buy and dissect him; brighten up our lens for microscopic inquiry, get ready our test-tubes, and examine his blood and secretions. These, sir, are the proceedings which must help to solve this most interesting problem.'

What, let me ask, would be the value of our physiological knowledge, if other organs had been thus investigated? Were I asked to explain the use of the pancreas or of the salivary glands, would not my first act be to ascertain their exact position—their relation to other parts? or, should I leave this entirely out of my inquiry, raise the wing of hypothesis, and indulge the fancy, that, as these organs are somewhat pallid, they might possibly be a 'birthplace' or 'nursery' for 'white corpuscles,' and when my lens had, perchance, discovered some stray ones in their returning blood, at once raise the 'eureka!' of a brilliant discovery.

Happily, our better acquaintance with these and other organs has not been cultivated in this



spirit. Due attention has been given to their anatomical relations. But has the Spleen enjoyed this advantage? Has not our introduction to it been conducted on principles which, in regard to other organs of the body, would be deemed not otherwise than absurd?

I say, then, having regard to the extra work to be done, that the hypothesis of a Spleen's existence is plausible, before he jumps upon the stage, like the clown in the pantomime, and cries out, 'Here I am!' When actually grinning<sup>1</sup> before us, his *raison d'être* should be no mystery.

The foundation of my argument has been laid on the rock of Anatomy, the only solid foundation—one which cannot be shaken.

All other hypotheses (as far as I know) absolutely ignore the Spleen's anatomical relations—they divorce it from the bonds in which Nature has tied it; and would be as sound, yes, a great deal more sound, if the Spleen were hung as an appendage at the end of the nose, or returned its blood into the general circulation, instead of holding that

<sup>1</sup> This word has a philosophic meaning, as will appear in the sequel.



invariable position which Nature has assigned to it in the portal system.

The Spleen's position, then, being accepted in its just importance, the question arises, what does it do in this position? For, if it does anything, that very act is obviously *an* use, and it is presumptively *the* use of the organ, until anything be shown to the contrary—nay, more, it is conclusively 'the use' under the same conditions.

But let me not be misunderstood, for the word 'conclusive' is apt to mislead. It is not, of course, finally conclusive, but only conclusive *pro tempore*—that is, it is good, as far as it goes. It does not preclude further inquiry; on the contrary, it invites or rather demands it—it only points out the way.

If a presumption constitutes a moral obligation, when there is no presumption to the contrary, and is as binding to action as rigid demonstration, does not the analogy hold good in the action of our minds? Does not a presumption equally demand intellectual assent, until an adverse presumption springs up?

Now, the act or function we are looking for is what I have shown it to be. There is no question



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up to this point; the ground I stand on is undisputed. The Spleen's recurrent blood meets the confluence of the mesaraic vessels. This is the only venous blood of the body which stands in a wholly exceptional position, and something comes in which seems exactly fitted to that exceptional state.

Can I rest here? Is it enough to point to an act, and ask Philosophy to affirm its value? By no means. She looks coldly on my postulate, and declines to entertain it. 'Push it back,' she says, 'and proceed; you are warm in the pursuit; indeed you are right, as far as you have gone; but you may have something better, by-and-by, to offer me.'

I knew what answer I should receive, and was quite prepared to accept it.

At this point, without quitting the channel in which my thoughts have been flowing, I find myself carried by their current into another man's territory; and here, unless I am much mistaken, I shall have to spring a mine of discovery on a large portion of my readers. Who, indeed, will not be surprised to hear that 'the use of the Spleen' has been known, or, rather, might have been known, for



almost two centuries; that it was discovered by a great philosopher, who did not hide it under a bushel, but finished his exposition with the words of exultation, 'Is not this the long-sought-for use of the Spleen?'

It is no uncommon thing for a man's labour to be unappreciated, yet seems it not strange that the deep brooding and travail of so fine a brain should have been so long overlooked! Perhaps, however, some explanation may be given of this, and be found to lie in the fact that our philosopher drew his knowledge from very deep fountains, and even evolved his physiology out of the doctrines of Galileo and Newton's 'Principia.' Cease we, then, to wonder that he shot his bolt over the heads of his generation, and that few or none have since cared to take it up. Haller, who read everything, could not always read profitably: the science that was difficult was distasteful to him, and he allowed to pass with a simple allusion the deeper thoughts of others, which time or other reasons did not enable him to master.

What, now, was the manner in which our physiologist interpreted Nature's arrangements?



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Founding his physiology upon anatomy, of which indeed he was a master, and thus connecting the Spleen with the Vena Portæ, and through this with the Liver, he had to consider what part it played in the function of this last-named organ, with which Nature has universally bound it.

The doctrines connected with the secretion of the several fluids of the animal body are among the most abstruse with which physiology presents us; and as the Spleen has a certain part therein (as will subsequently be shown), he leads up to a demonstration of its office by laying down, in a series of propositions, the laws, according to which secretions are first formed in the blood, before they come to the place appointed for secretion; and he then demonstrates in what manner they are separated from the blood by the glands.

If, he says, we view a drop of blood with a microscope, we discern a number of red globules swimming in a limpid fluid, and perceive how the globules, attracting one another, unite like spheres of quicksilver, which, as they touch, run into one another. Now most fluids consist of attracting particles swimming in an aqueous fluid; and, indeed,



all liquors are more or less fluid, according to the greater or smaller cohesion of the particles which swim in the aqueous fluid. There is hardly any fluid without this cohesion of particles, as is apparent by the bubbles that stand on the surface of water.

The secretions consist of attracting particles. Now this principle of attraction is an universal power in matter, and seems to be the only principle from which there can be a satisfactory solution given of the phenomena produced by the 'Minima Naturæ;' as that other attractive principle, which is of a different kind from this, demonstratively explains the motions of the great bodies of the universe, and which is not in the least disturbed by the attracting power we now speak of, which only exerts itself in particles that are at a small distance from one another.

From this principle, then, that the blood consists of corpuscles of various figures and magnitudes, and endued with various degrees of an attractive power, and that of such particles the fluids secerned by the glands are composed, he endeavours to show how the corpuscles that compose the secretions are



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*formed in the blood* before they arrive at their discerning glands.

To do this he lays down a series of propositions, of which the first is this:—There is a power in Nature by which each particle of matter attracts every other particle with a force that increaseth in a greater proportion than that by which the squares of the distance decrease—viz., in a reciprocal triplicate or quadruplicate proportion to the distances.

This power may be thus illustrated. The particles of salt dissolved in a large quantity of water do not sensibly attract one another till part of the water has been evaporated, by which means approaching each other, their attractive force increases, they run to one another, and uniting form crystals, whose parts have a strong cohesion, and therefore the force by which each particle attracts every other particle must increase in a much greater proportion than that by which the squares of the distance decrease.

Now, the particles of which the secretions consist have diverse attractive forces. Those in which the force is greatest unite very rapidly, of which we have an example in the salts that are removed



by the kidneys—organs that are virtually very near to the heart, and receive large quantities of blood. Had, indeed, the station of these organs been virtually distant, so as to have greatly retarded the blood which had to pass through them, the attractions of other particles than those now separated would have had time to take effect, and so have united with the true urinary salts, and consequently the urine could not have been distilled such as it is now, or at least but in a small quantity.

In marked contrast with the Kidneys is the anatomical arrangement of the Liver, which has to separate from the blood a more viscid fluid, consisting of particles of a much weaker attractive force, and therefore requiring much longer time for their union.

Now, the position of the Liver is very remarkable. Anatomically it is very near the Heart—physiologically very remote. Inasmuch as its secretion has to be mixed with the chyle as this passes from the Stomach into the Duodenum, it could nowhere be so conveniently placed as where Nature has laid it; but when we consider the long circuit the blood has to make before giving up those elements the



organ is destined to separate, and also the retardation of the blood, which is going on in a geometrical progression, owing to the subdivision of the vessels with their increasing areas, there would seem to be no part of the body which could be considered more distant.

Does it not sound like a paradox to say, that an organ may be anatomically near the heart, but physiologically very distant? Yet such is really the case, and we have now to see how this is brought about.

It is accomplished by a very peculiar provision ; for here we see that Nature alters her constant method of sending the blood to all the parts of the body by the arteries, and forms a vein of a new character, which is no branch of the Vena Cava, as all the others are. Into this channel she collects all the blood from the mesenteric and cœliac arteries, and sends it to the Liver with greatly retarded velocity, after it has passed through all the intestines, stomach, spleen, pancreas, &c.

By this singular contrivance the blood is brought a great way about, before it arrives at



the Liver, and its celerity is extremely diminished, so that the corpuscles which are to form the bile may have sufficient time to attract one another, and unite before they come to their secerning vessel.

Having thus shown that the Vena Portæ is Nature's plan for the retardation of the blood, so that the particles of bile may have time to form before arriving at the glandular 'acini' of the Liver, he proceeds to show what is the particular design of the Spleen in this special arrangement.

I must approach this part of my subject somewhat gradually.

Let us suppose we are receiving our first lessons in Physiology, and that we are told that the blood is distributed to our various organs to keep them in proper repair, and to bring back all waste material, or the products of disintegration.

Having learnt this, we are further informed that at one part new material must be taken in—that we have, in fact, a 'coaling station'—and that the fuel received at this place must be subjected to a 'screening process' before it can be properly elaborated into blood. This peculiar refining



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action, or sifting-out of what is only comparatively vile, is of so great importance, that one of the largest organs of the body has been appointed for the office—so large, indeed, that Laurentius, who has divided inward organical parts into ‘noble’ and ‘ignoble’ (*principes et ignobiles partes*), has placed the Liver amongst the former.

Now, a large organ implies great service, and much service involves the necessity of a large supply of blood; and, again, as the blood must be venous—i.e. it must move with the retarded velocity of venous blood—and seeing, moreover, that the quantity which can be disposed of through the intestines seems to be insufficient to meet Nature’s demand for the Liver’s discerning action, she has this extraordinary contrivance in store. She empties the additional blood that is needed into a large spongy body, or cistern, provided for that intent and purpose; and by this means she not only provides the additional blood that is needed, but delivers it into the channel of the Vena Portæ with the same retarded flow which regulates the current with which she has to mingle it.

The importance of this is laid down in another



proposition (the 11th), which is to this effect. Particles attracting one another in a fluid, moving either with a swift or slow progressive motion, attract one another just the same as if the fluid was at rest, *if all the particles move equally*; but an unequal velocity of the particles does mightily disturb their attractions.

Our author, then, first explains the use of the Vena Portæ to be Nature's plan for the retardation of the blood, so as to give the bile-particles time to form before arriving at the place where they are separated by the glands; and he then shows that the blood supplied to the intestines, which is to form one part of the Vena Portæ, is not sufficient for the discerning requirements of the Liver, and that the Spleen is Nature's method of providing the additional quantity that is needed, and is so arranged as to deliver it with the same velocity as its confluent stream, in order that the attraction of the particles may not be hindered. 'Is not this,' he concludes, 'the long-sought-for use of the Spleen?'

It is seldom, indeed, that Physiology permits any play of fancy, though her sister, Anatomy, has



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been wont to indulge the vein, if, at least, we may draw such a conclusion from the names she has given to so many parts of the body.<sup>1</sup>

Yet, in the particular arrangements we have been reviewing, this obtrusive faculty will scarcely restrain herself, but seems to be telling us that Nature, after turning away her head in grief at the treatment she has so often received, is not only ready to forgive everything, but is trying to win over even the vivisectors, by inviting them to a marriage celebration.

Nature here, speaking through the fancy, thus addresses us: 'See! what you have been doing. You have slain the bridegroom whilst on his way to meet the maiden whom I had destined to be the companion of his life. You have seen the young man and maiden, as they were coming from different parts of the country. They were perfect strangers; they had never seen each other before; one had been travelling westward, the other towards the south; their business and objects in life seemed to be altogether different, and no one

<sup>1</sup> *E.g.*, Torcular Herophili, Caput gallinaginis, Fornix, Hippocampus, &c.



could have thought they should ever come together. You may have seen them setting forth from their early homes with the light step and vigour of youth, and engage in occupations which seemed to have no relation to each other. The young man went and shut himself up in a strange place, as if he had no object or pursuit in life, but he was all the while acting in obedience to my behests ; he was doing what I intended, as my son James Keill has just explained to you. The maiden, like Ruth in Hebrew story, went to glean in rich cornfields, and you now behold her returning from her labour, her hands laden with the fruit of her industry. She (the mesaraic vein) and her future husband (the splenic blood) are now advancing with equal steps, and they meet, with my approval, at a gate which you have named the *Vena Portæ*. No sooner do they arrive at this point, than I join their hands together, and thenceforth they are bound in indissoluble union.

‘This is the SPLEEN’S MARRIAGE. Let no practical physiologist henceforth dare to put asunder, whom I have thus joined together. Behold ! I am sending them to a habitation, not intended for ONE, but specially enlarged for the reception of TWO—



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the two whom I have thus brought together. In this palace they are to live, and here they shall only die in giving birth to a countless progeny ; each one of which, the offspring of their mingled blood, shall sift and winnow, in the little cell allotted to it (the "acini" of the Liver), those grains of corn which their parents have equally distributed amongst them.'

I have been passing from 'grave to gay,' and, indeed, it was my wish to round this little trifle in the old-fashioned manner of 'making things pleasant all round.'

If to some I may have seemed to be playing with a serious subject, and occasionally to have indulged in unbecoming levity, I would maintain that I am innocent of the charge ; and I should do this with the confidence that earnest minds would at once appreciate the full strength of my defence, and not even call upon me for an answer.

I now shake hands with Science ; but I cannot part with the Spleen without a thought about its place in Poetry, and here I am more puzzled about its true position than the philosophers have been about its place in Physiology.



Is it mirth or passion, or either, to every man according to his humour? Into what remote antiquity should I have to plunge to settle its earliest acceptation? I am not fitted for this inquiry, and do not propose to enter on the pursuit. Whence did Persius get it, when he said—

Nature has formed me of satiric mould,  
And Spleen too petulant to be controlled?<sup>1</sup>

Doubtless, in his day, the metonym was as common as it is in our own.

The Lambs (brother and sister), who revelled in tropes, have not used it in the same sense. Mary, in her delightful ‘Tales from Shakspeare,’ says: ‘Cordelia’s plainness of speech, which Lear called pride, so enraged the old monarch, who, in his best of times, showed much of spleen and rashness,’ &c. Here it obviously represents ‘anger,’ or ‘passion.’

But Charles, in his Essay on the inconveniences resulting from being hanged, makes it the organ of ‘mirth.’ ‘The ludicrous,’ he says, ‘never fails to intrude itself into our contemplations upon this mode of death; we cannot, without a mixture of spleen and contempt, behold the human carcass reduced,’ &c.

<sup>1</sup> Sum petulanti splene cachinno.—*Sat.* I. 1. 12.



In that book of never-failing charm and instruction, the 'Curiosities of Literature,' we have an amusing speech, supposed to be delivered in the shades by the great tragic actor, Montfleury, in which 'spleen' is clearly the metonym of 'passion.' Having died from the violent efforts he made in representing Orestes, in Racine's play of 'Andromache,' he is there pouring out his lamentations that tragedies had ever been invented, and wishing that comedy had been his vocation; for then he should at least have trifled agreeably, and have worked off his spleen in laughing.

I know not if the Latins have ever associated the Spleen with 'anger.' I think not, but I would leave the point to more profound scholars.

Serenus Samonicus not only connects it with mirth, but tells us that, even when diseased, it does not vacate its office, but then gives rise to an 'unmeaning,' sickly smile—a 'sardonic grin,' as he thus happily expresses it:

Splen tumidus nocet, et risum tamen addit ineptum,  
Ut mihi Sardois videatur proximus herbis,  
Irrita quæ miseris permiscent gaudia fatis.<sup>1</sup>

So entirely, indeed, does this poet give it to

<sup>1</sup> Poetæ Latini minores. Ex edit. P. Burmanni.



‘ mirth,’ that he tells us its removal has been held to extinguish for ever the light play of laughter, and even to furrow the brow with the enduring wrinkles of age :

Dicitur exsectus faciles auferre cachinnos  
Perpetuoque ævo frontem præstare severam.

With Shakspeare, as one might expect, the Spleen is made to play many parts ; and the ‘ soccus ’ and ‘ cothurnus ’ seem to divide it between them.

But, after all, is not ‘ anger ’ an innovation on the original meaning, and are we not at liberty to give the preference to Shakspeare’s epithet of the ‘ over-merry ’ Spleen<sup>1</sup> to any that would associate it with an opposite function ? Surely, in such a case, Poetry and Science would join hands ; for, as the latter tells us, that the Liver, which is the seat of Bile, receives the streams of blood which are poured forth from the Spleen, so Poetry would raise her gentle voice, and say : ‘ Is it not well that Melancholy should be tempered with Mirth ? ’

<sup>1</sup> Haply my presence  
May well abate the over-merry Spleen.

*Taming of the Shrew, Act I, Sc. I.*