Too florid & rhetorical for a scientific thesis
Theory of the action of mercury – chiefly at thins the blood, & prevents these plastic exudations. The arguments by wh. this view are supported are certainly ingenious, & I suppose that is the most that can be said of any theory on the subject.

Evan Pierce Williams,
M.R.C.S. Eng.

A Short Sketch
Of the
The Connexion between
Inflammatory diseases, and Mercurial
Treatment.

On reviewing the history of Medicine during what may be considered the dark ages of that science we are forcibly struck with the Empyricism which universally prevailed in the treatment of disease; other sciences could boast of great luminaries whose radiant effulgence (so bright in itself that still it dazzles the eyes of the Scientific Student) was in that age of darkness yet more highly Enhanced by the obscurity which reigned universally around; but the

path of medical study was dark indeed, unilluminned, as it yet was by the reflected light thrown on it in subsequent times by the deductions wrought out in its companion sciences, (in Optics, Chemistry, Mechanics &c) by the followers of Newton, Boyle &c &c; those mighty minds who with precious gems of thought delved out from the deep mines of those great intellects with which heaven had blessed them, raised up the lower stories of that splendid fabric, which in these later days stands forth well worthy of that name which universal consent has accorded to it as "The Temple of Science".

Thus whilst the other sciences had thrown aside the trammels which had formed their shroud in the middle ages, Medicine yet unliberated from her

bonds still remained in the hands of unscientific men whose only qualification lay in the knowledge, and practice of a blind Empyricism; as yours was on those men whose to whom Modern Medicine owes as a science its very existence, struck with the faintness of the ray of light which the knowledge of the nature of diseases then threw upon their modes of treatment, they endeavoured by Anatomical and Pathological study to do away with the estrangement which had so long existed between these twin daughters of Aesculapius.

As every coming age added to the number of these arduous labourers in the field of Medical study the feeble glimmering which at first had only served to render more obscure the surrounding gloom gradually overspread the Medical Horizon, and

after every interval of time yet more and more foreshadowed the coming dawn of medical knowledge.

The early students of Physic in selecting especially as the subject of their labours, the pursuit of Anatomical and Pathological knowledge chose the true avenue, by following which they could alone hope to raise the study of Medicine to the rank of one of the Exact Sciences.

But since, during such a long period of time so many have followed this peculiar path of scientific research in the study of Medicine, a prevalent opinion has sprung up that other, and as leading roads are open to the medical observer, and that in leaving the crowded thoroughfares of Pathological observation, one need not prove a recreant at the shrine of Physic, but will find in the treatment

of disease a pursuit still more important and one where fewer rivals will jostle him in his progress.

In adopting this peculiar line of investigation the observer soon reaches a point at which once more a divergence takes place in the paths which he may follow, and is called upon to decide whether he will enter upon the study of the "Nature of Medicines themselves" or upon that of their "application to, and mode of action in disease".

In forming a determination to pursue the latter course one cannot but feel with what difficulties the path is beset, and with what inadequate resources of knowledge and acquired experience the junior student must prepare to brace his mental powers for a struggle with these obstacles; but supported by a firm conviction of the great importance of the subject,

and by the feeling which cannot but be implanted in his breast; that on this ground will be hereafter fought the great battle which must ultimately decide whether our medical resources will ever be able adequately to cope with the ravages of disease; animated by such feelings he will hopefully enter on the course of labour, and of mental exertion which he has chosen.

Of the many remedies, the application of which in the treatment of disease has been fought with such important results for good and evil, there is none which involves the student in greater perplexity, when he has to decide on their absolute beneficial effects, than Mercury.

Through a long series of years this remedy has held a very high rank amongst the component members of our

Pharmacopias, and it was only at a comparatively recent period that a distrust in its curative powers began largely to prevail.

At one time lauded as the greatest of all remedial agents it had attained the Zenith of its reputation, of late years cavilled at by very many I would fain hope we have now reached its minimum of fame.

It has been too much the custome to form our judgement with regard to the curative properties of any drug from statistical statements of the number of cases in which it has proved beneficial or otherwise.

It is now pretty generally acknowledged that of all the sources from which we derive information, medical, or otherwise, that which in an array of figures has assumed the name of Statistics is peculiarly liable to fallacy;

and it is hard to imagine that it could be otherwise, when so many different observers have to record their experience in favour of such diverse theories.

But I think we might hope to silence cavil itself if we could succeed in tracing the remedial effects of medicines to their ultimate cause, and the modes of their action.

Even if without arriving at this great end we can make some progress towards its attainment. I imagine that the time spent in the pursuit of such an object could not be esteemed as thrown utterly away.

Consistently with this proposed attempt to trace the remedial properties of medicine to their ultimate source from whence they derive their therapeutical action, I will in the few subsequent pages endeavour carefully

to follow out the modes in which Mercury appears to affect the system generally, and in which it acts particularly as an Antiphlogistic agent. And as the basis of the few remarks which I may venture to offer on the subject, I will adopt a theory founded on several experiments made some years ago by a student of Medicine in the Edinburgh University, and honoured with no other notice by a casual allusion in Dr Christison's able work on Materia Medica.

In his unpublished Thesis Dr Samuel Wright, who appears to have made very careful experiments on this subject, has stated that "the blood under the specific action of mercury becomes materially changed in its constitution, is rendered more watery, more prone to putrefaction, less charged with albumen, colouring

globules, and fibrine, and is loaded with a very fetid, fatty matter".

Now I think that these facts pointed out by Dr Wright furnish us with grounds sufficient on which to build an hypothesis. We have evidence adequate to prove that the blood is more or less in a morbid state, or at least has undergone some alterations in its constitution when any of the various textures of the body have been attacked by inflammation. And it seems now a well established fact ascertained by experiments on blood newly drawn from persons labouring under inflammation, that an essential part of the disease is an increased production of numerous globules within the vessels throughout the circulation, and these exhibit a peculiar tendency to coalesce into irregular masses or clusters. And besides these changes in the corpuscles

the liquor sanguinis, or the fluid portion of the blood possesses a remarkable peculiarity of being loaded with a greater than normal quantity of fibrin, and to possess an increased amount of plasticity, showing the presence of solidifiable matters in larger quantity than natural; and the blood over the whole circulation gradually assumes that condition usually expressed by the term "size," and shows a huffy coat after coagulation has taken place. In cases of a more violent kind of inflammation the proportion of the fibrin to the other constituents of the blood is materially increased, often to a great extent, and the tendency to the aggregation of its own particles during coagulation is also increased so as to form a preternaturally firm, and contracted coagulum.

The occurrence of these altered

conditions of the blood, when some inflammatory disease exists, is I believe universally acknowledged by Pathologists of the present day; but it is a disputed point as to how these changes are produced, whether the altered condition of the blood is the effect of inflammation or its cause.

According to Mulder the previous increase of the fibrin is the cause of local inflammation, but cases have been cited where pleurisy was fully established, though the blood was not yet changed in its proportion of fibrin.

We find that there is a high proportion of fibrin in the blood of pregnancy, enlarging towards the last months and the increase continuing for some time after parturition. And there are other instances of the increase of fibrin in the blood occurring

posterior to the inflammatory process, these later facts shewing that increased amount of fibrine in the blood is not always the forerunner of inflammation. The account which Mulder and Simon give of the manner in which inflammation originates, viz, that it is by a previous increase of the oxides of Protein in the blood appears to be unsupported by facts, and unlikely. But the increased amount of fibrine in inflammation would rather appear to be a consequence of the inflammatory state of the system, which, thus giving increased solubility to the corpuscles, they yield fibrine and albumen to the fluid part of the blood. But indeed as to the source of this augmented amount of fibrine the question is as yet at issue. It is supposed by Prackrah and Jones to be derived from the albumen, and such at first sight would seem very probable,

considering the close resemblance which exists in the chemical composition of these two elements. But we have strong objections to this explanation of its source in the fact that albumen is not always vicariously decreased in the cases where there is an augmentation in the quantity of fibrine, and in those instances where a decrease in the proportion of albumen occurs it can otherwise be accounted for; moreover we find that the proportions of albumen and fibrine are simultaneously increased in acute Rheumatism.

I think we may more properly consider it as a product of an increased solution of the red discs, judging from the general fact that where the corpuscles are in a larger proportion the fibrine is less and vice versâ. And this augmentation in the amount of fibrine may be regarded as

occurring throughout the circulating system, in consequence of the increased rapidity with which the corpuscles disolve in the blood of inflammation, so giving rise to a large supply of fibrin as well as albumen; and not occurring in the past affected as has been adduced by Dr Williams.

Having now completed a general, but very cursory summary of the altered condition of the blood resulting from inflammation, we are more capable of taking into consideration the present mode of treatment, and will afterwards endeavour to reconcile this with the results of the experiments of Dr Samuel Wright.

The chief object of our treatment of inflammatory diseases is to obtain that favourable termination, if it may be so called, generally expressed by the term "resolution" which is simply a

subsidence of the disease, the affected part, or organ resuming its normal state of health without undergoing any further morbid changes.

The question arises, how is this happy result to be accomplished? By antiphlogistic regimen, and remedies; the former of which consists essentially of "low diet, rest, and quietude", and this is all that is necessary in the more slight cases of inflammation. But when the disease assumes a more violent form, and especially when it attacks some important internal organs, or surfaces we must have recourse to our antiphlogistic remedies.

It is sometimes stated that the only one of these antiphlogistic remedies on which absolute reliance can be placed is bloodletting. But its indiscriminate use in practice has been much

rejected of late in consequence of its producing, when vigorously employed, an extreme state of depression in the system.
I shall not at present make any further allusion to this as I shall have occasion hereafter to make some few remarks on the anti-phlogistic effects of Bloodletting when used in connexion with Mercury as a remedial agent.

Mercury appears to be much more relied on in the practice of eminent medical men of the present day than one would be led to expect from the theoretical opinions, as expressed by many of them with regard to its value as a remedial agent. We can, in some measure, account for this apparent inconsistency between the theory, and practice of many when we consider that the early habits of practice of men now advanced in life, and holding

a deservedly high standing in the ranks of the profession, were acquired when a distrust in mercury, but little prevailed in the various schools of physic.

As an advocate for the use of mercury I should indeed be sorry to seek to gain any adventitious support for that remedy, from the fact, that its administration is still continued to a great extent even by those medical men who express as their theoretical opinion an almost universal distrust in the antiphlogistic, and other medicinal properties of this mineral. On the contrary I shall rather endeavour in the few subsequent pages to point out, or rather mark the boundaries of the path, which it seems to me, should be followed by those capable of tracing the connexion between the acknowledged effects of mercury, and what are now universally

confessed to be the tendencies, in inflammatory disease, towards a curative process. At the same time and once for all I must say that in my humble opinion some weight should be attached to the favourable prestige shown by many past generations for this drug.

With regard to the nature of inflammations the beneficial effects of Mercury appear to be more decidedly marked in those, which have a tendency towards the deposition of lymph, or are of an adhesive character, and considering as a fact, that after the administration of Mercury the blood is reduced to a more fluid state than before recourse has been had to this remedy one may I think draw the conclusion that this induced state of the blood is antagonistic to the deposition of lymph, and that such should be the case does not appear to me to be, at least prima facie an improbable result;

for the contents of the vessels being rendered more thin there would not be actually propelled through the arterial system the same amount of solid matters to be yielded up to the inflamed districts, in the shape of lymph of which we dread the effusion and its consequent results.

As a direct consequence of the induced fluidity of the blood, and consequent non effusion of lymph we may view the well authenticated fact that serous are more favourable to the remedial operation of mercury, than mucous membranes, and in the same light may we look upon the interesting exceptions which present themselves in some cases of laryngeal affections.

In respect to the states of the constitution which aid, or hinder the curative operation of mercury it is an acknowledged fact that its use is more beneficial in inflammations

occurring in a strong, and otherwise healthy constitution, or habit of body, and that it is contraindicated in a diathesis of a strumous character; and it appears to me that nature in furnishing us with this finger post to point out where we should give the rein to our course of mercury, and on the other hand where we should withhold this spur to the system has enabled us, though dimly, to copy the modes in which this remedy acts in diverse states of the constitution, for whilst in a strong and healthy frame of body mercury tends to produce a curative effect by its power in checking the deposition of lymph; on the other hand in a weak, and scrofulous system the action of this drug would merely seem further to diminish the consistence of the blood, already too diluted, and prove the very nature

of which we have not to dread inflammatory danger as arising in the lymph effusing powers of the arterial coats.

Mercury is generally regarded as contributing in two ways towards the cure of inflammation. First by constraining the morbid energy of the blood vessels, and counteracting the powers by which the inflammation is carried on, and thus it takes its place as an antiphlogistic agent in the same rank as bloodletting.

The thin blood theory can I think be reconciled with this first view of the curative effects of mercury; the induced fluidity appearing to act as the cause of the constraint of this morbid energy, for the coats of the vessels, acting on their less resisting contents, are more easily able to deprive the inflamed districts of the morbid excess of blood; a tendency towards a return to a normal state being produced,

and in this result it is marshalled along side of its companion antiphlogistic agent, "bloodletting", both summoned to the field to oppose the powers of inflammation, and as the immediate result of their action producing a state of depletion in that body which they are called to protect, but as in every rightful contest employed with the ultimate hope of gaining complete victory over the aggressor. Secondly, Mercury is viewed as aiding in the separation of parts by promoting the removal of substances foreign to them, whether fluid, or solid which inflammation has produced, and left behind. It would seem here to exert its influence on the capillaries of the inflamed part, by dilating, or at least in some way or other decreasing the amount of the Protein compounds, and in this way contributing to the facility by which

the blood may circulate, or pass out from the congested vessels to make room for another portion of a more healthy kind to flow in. In this way we can account for its absorbing power, indirectly, by relieving the capillaries of their comparatively stagnant contents whereby they regain their normal tonicity - which is requisite to allow a free passage of blood through them; and we can imagine that any exudations previously infiltrated into the surrounding textures would be taken up with greater facility when the blood is successively renewed by a more free circulation.

That bloodletting should be not only a useful, but often a necessary adjunct to the endeavours of the Physician who wishes to subdue a high state of inflammation by keeping the system under the effects of mercury, does not appear inconsistent with the theory by which we have

endeavoured to account for the anti-phlogistic tendency of mercurialism.

For bloodletting has long been experimentally proved not only to produce a resultant state of the system in which the total quantity of blood in the body is diminished but also accompanying this, a reduced amount of solid matter, exceeding in proportion what we might naturally have expected, would be the diminution, considering the duration of the venesection or arteriotomy as the case may be.

And as either of these remedial agents singly is often unable to produce those happy results, which experience has pointed out to us as the fruit of their joint action, we may naturally be led to expect as the result of our inquiries a similarity in their mode of action and a diversity merely of degree in the modus operandi of each.

And I think if we endeavour —

separably to trace out the action of each of these agents on the blood, we will find that our expectations are at least not without some shadow of foundation.

Bloodletting, by decreasing the quantity of circulating fluids ~~in~~ in the body, and by diminishing the amount of solidifiable matter in that fluid, appears to have a direct tendency towards a reduction of the general tone of the system; and by increasing the fluidity of the circulating medium, would not mercury be also travelling towards the same goal? I can imagine that unchecked inflammation may have made such rapid strides as to be quite unamenable to the action of mercurials. These drugs on their administration not being able to overtake the giant steps with which the ravages of disease have

advanced, and thus incompitent even to reach that point at which the hand to hand struggle of these mighty rivals could take place; but when his more active, yet perhaps feeble ally, Hoodleßing, has been summoned to the course there is the haste of Mercury redoubled, and in a few hours perhaps through the aid of this acquired assistance is the lagging mineral brought up to that critical point where on equal ground he can meet, and, as experience has often happily shown, successfully cope with the antagonistic disease.

Not only in the action, but also in the consequences of these remedies (Hoodleßing, and Mercury) there may be traced a similarity; for as their mode of action in combating inflammations seems to be the same, differing only

in degree, so the consequences of either being pushed to extreme agree in producing debility, and ultimate emaciation in the subject under treatment.

And similar resultant effects in both remedies appear traceable to a like cause, viz, the destruction of the red corpuscles of the blood after the use of either of them, and the consequent pallor of the surface; Which striking coincidence, between their actions, in the course of a quotation from another author, has been pointed out by Dr Watson in his Lectures on Practice of Physic; and on recalling the cases in which these active anti-inflammatory agents have been pushed close if not actually to the verge of danger most old practitioners, we believe, will but too well remember instances in which from the very use

of daron the complexion of the Patients have been changed to the tint of purest White which marks the coming snow storm.

The chief remedial power of mercury is generally acknowledged to be that of stopping, controlling, and altogether putting an end to, the effusion of coagulable lymph, and of bridling adhesive inflammations, but alas! in common with every other good with which we have been furnished by bountiful nature, this remedy in some cachexies when given in moderate doses, and in all when administered with a too lavish hand, is productive of the most calamitous, and even fatal results.

The beneficial action of mercury as an antiphlogistic agent appears to be more especially marked when applied to inflammatory

diseases which have their seat in serous membranes. In such localities the endeavours of the Physician are first aimed towards the prevention of the effusion of lymph, or if such effusion has already taken place, to prevent its increase; the fact that mercury is the sheet anchor on which in such cases he rests his main reliance, can only be accounted for by the happy results which he has often found consequent on such a mode of treatment, and therefore in endeavouring to trace the mode of its operation under these circumstances we have the happy omen of successful practice to encourage us in our attempt. The induced fluidity of the blood resulting from the administration of mercury appears to be here peculiarly adapted to the

combating of that condition which we dread. For it readily follows from the preternaturally thin state of the blood that less solidifiable matters are contained in it, and hence less of the lymph effusing power can exist in the coats of the vessels which contains the blood. And thus we may account for the remedial action of Mercury in inflammations of serous membranes, both by its preventing effusion where none has already taken place, and also where that result which we dread has already to some extent occurred, we can by Mercurial treatment limit the evil to what has up to this time been effused, and even when the disease has pursued its course, when lymph has been effused and when we dread that lymph becoming organised, and consequent adhesion between the sides of the containing sac, we may

still place great reliance on Mercury, as a powerful agent in promoting absorption of the effused matter; but consistent with our theory of an induced state of thinness in the blood, Mercury would appear to act here in an indirect manner; thus the lymph which has now it's seat in the serous sac is tending towards organization, our great object is to prevent this, could we take a more effectual way to do so than to cut off the supply which the blood furnishes towards the building of new textures? Now mercury, by inducing an abnormally fluid state of the blood, appears to me to place in abeyance the constructive powers of this fluid, thus damming up the well spring from which the new textures should derive their very existence.

When fluid has already passed into a serous sac we have again recourse to Mercury, but now to what may be called its reparative action, to promote its removal. Here by thinning the blood it would seem to act as a means of withdrawing an excessive accumulation of that fluid from any part which may be the seat of inflammatory disorder, and by bringing the circulation to an equalized condition throughout every part; thus what may be styled the partial stagnation of the blood in, and around the seat of inflammation is removed, and the normal proportion of this fluid to the ~~vascularity~~ of the tissues is restored throughout the vessels of the region, and hence a fairer scope is allowed for the action of the natural

powers of absorption.

The antiphlogistic, and reparatory powers of mercury over acute inflammations are most clearly illustrated by its power, & influence over hitis; the eye being an organ peculiarly adapted for furnishing us with ample opportunities to observe the process of disease, and the influence of remedies over diseases.

The iris is lined by a smooth membrane, forming a shut sac and analogous in function as well as in anatomical character to serous membranes of a larger extent. This similarity in the nature of the membranes supplies us with sufficient reasons to arrive at the conclusion that the action of remedies on them is precisely identical in every respect, and is adequate, I think, to remove whatever scepticism any one may have imbibed.

The observation of diseases in

this organ appears also to furnish us with evidence, that it is by indirect promotion of absorption (i.e by the induced fluidity of the blood, producing an equalized condition of the circulation, which tends towards a withdrawal of the stagnation of the blood in the inflamed part) that mercury acts beneficially as a reparatory agent in inflammation; for whilst under its influence the removal of the products of inflammatory disorder is accelerated, other foreign matters such as fragments of Cataract, effused blood &c, which may have found their way into either chamber of the eyes, are just as rapidly absorbed although not a particle of mercury is administered.

It is with regret at the very incomplete manner, in which I have been able to accomplish the task I had undertaken,

that I now feel compelled to draw towards a close of this short attempt, to elucidate the connexion between the remedial actions of mercury and the diseases in which it is administered, especially those of an inflammatory nature. From the limited time during which I have been able to direct my attention towards this subject and the want of practical experience on it, I feel that the few remarks offered in this Thesis are but unsatisfactory in their nature, and at best but touch on those salient points which must strike the observer directed to this peculiar branch of Enquiry.

But whilst engaged in writing these few remarks on the actions of mercurials, I have been much struck with the broad, and ample field which here lies open for the competent observer, whose previous studies and experience would enable him thoroughly, and with

the care, and attention of which the subject is well worthy, to enter on the investigation of this important, and interesting subject.

In the preceding pages I have rather endeavoured to reduce to words my own incomplete ideas, and the suggestions forced upon me in my previous course of study, than merely to repeat the views of others on the subject of mercurial action in inflammation, and though perhaps the latter would have been the safer course for so young, and inexperienced a medical observer, yet it is not with regret that I look back to having adopted this more original course in the formation of my Thesis.

For it appears to me that the great object to be gained by Essays of this sort is not so much to mere accumulation of papers in which the theories and views of preceding Authors have been

expressed in an altered diction, but rather that each individual type in medical literature by opening however obscurely at something of originality might not only perhaps, thus throw some faint light on subjects hitherto little investigated, but at the same time might lay in himself the foundation of a more original train of thought on professional subjects.

I now finally conclude this imperfect sketch in the hope, and full conviction, that henceforth as the march of modern improvement hurries on the advance of medical science, new light will be thrown on these hitherto obscure connexions between the disease, and its remedies.

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