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LECTURE ON THE NATURE & TREATMENT OF CHOLERA,

CONSIDERED WITH REFERENCE TO ITS

ANALOGY WITH CONGESTIVE AGUES OF QUOTIDIAN TYPE.

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LECTURE II.

GENTLEMEN,—

The object of my former lecture was to show that cholera is not a disease *sui generis*, but one of a large class produced by malaria;—that, operating on the individual, either by some agency with which we are unacquainted, or by a poison carried by the blood, its cause does not directly affect the blood itself, and is not capable of reproducing itself in the blood by the elaboration of fresh poison in the system, like that of contagious fevers;—that no poison is extricated from the blood by special emunctuary action, like that of small-pox and scarlatina, which is capable of giving rise to the same disease in another by inoculation or by infection;—but that diseases of this class are all incommunicable from man to man, and as there is no remedial object accomplished by the morbid action, and no noxious poison removed from the system, there is necessarily no crisis and no natural termination; and so far from disease of this class conferring immunity from subsequent attacks, one of its chiefest characteristics is a tendency to relapse, and to render the patient more, rather than less, amenable to the influence of the same impression for the future. Not being like that of exanthematous fever, (a poison which produces disease in the blood itself,) the cause of this class of disease does not operate as a source of continued irritation to the whole system, so as to produce continued fever, but on the contrary, acting in a manner directly opposite, it induces diminished irritability of the system, instead of irritation, causes depression, instead of excited action of the vital powers, and when fever succeeds, it is that of mere reaction against an impression opposed to vitality, not a struggle to rid the system of a source of irritation which proceeds unintermittingly towards the accomplishment of an end. When, in continued fever, the

digestive and cerebro-spinal functions become disordered, they do so in consequence of an all-pervading source of irritation, and in conjunction with excited circulation; but in the class of diseases under consideration, we observe the effects displayed in the digestive, the cerebro-spinal, or the respiro-circulatory functions, separately, or in either two combined, in conjunction with depressed circulation.

In continued fever, death occurs either in consequence of organic disease and change of structure in some vital organ, or from the effects of poisoned blood upon the brain; but in the class of intermittents, the brain is the last to die, death taking place in consequence of mere disordered function of the vital organs, without organic change of structure.

These wide distinctions between the effects which we know to be produced by the circulation of diseased blood in contagious fevers, and those which follow the impression of the unknown cause of epidemic diseases, led us to the conclusion that the phenomena displayed in the latter class, were inconsistent with the belief that actual change in the constitution of the blood could possibly be their cause; and if not on the blood, it is quite evident that whatever produces these effects, must operate on the sympathetic system of nerves, for only the sympathetic and the blood are distributed co-extensively with the effects observed.

We showed reason to believe, that in every disease of this class, the first effect of the unknown cause is an *impression* on the sympathetic, which impairs its power of exciting, regulating, or combining the functions of those vital organs whose unity of action is necessary to life; and that this impaired vitality or disturbed function of the sympathetic, is variously evinced by derangement of the functions, in whole, or part of the circulating, digestive, and cerebro-spinal systems, either separately or combined.

It was argued that, great as the changes are that take place in the appearance and quality of the blood, during a fit of cholera, this does not at all militate against the above conclusions, for these changes are not primary effects of poison on the blood, but secondary effects of functional derangement in the pulmonary and systemic capillaries, by which the blood is prevented from undergoing the processes necessary to its healthy condition, and to the maintenance of its vitality. It is only in consequence of cessation of such changes that the blood in these diseases loses its florid colour, its fluidity, and its vital property of forming a

firm coagulum as it dies, for it has been observed that blood drawn during an attack of cholera, as well as that taken from the body after death, shows all the wonted disposition of healthy blood to absorb oxygen from the air; and when we practise bleeding successfully in a severe case of cholera, and thereby restore the patient to immediate health, we find that the blood which at the first was dark, tarry, and adherent to the wound, and made to flow with the greatest difficulty, presently runs more and more freely, and before we bind up the arm we see it acquire all the characteristics in colour, fluidity, and free uncontrolled motion through the vessels, which belong to healthy blood. It is obviously impossible, that by simple removal of a portion of the blood, all the dread poison on which so many authors of repute insist, can be removed from the whole mass of the blood, along with this small quantity; on the contrary, this is rather an *experimentum crucis*, to show that restoration of the functions of the minute circulation in the lungs, and throughout the system, is the cause of the immediate restoration of the blood to its natural condition, which had been altered only by the cessation of these functions.

Having thus endeavoured to prove that the disorder is not originally, but secondarily, in the blood, and therefore that the primary cause must be morbid impression on the sympathetic nerves, we proceeded to consider the great characteristic of this whole class of disease,—viz., periodicity of attack, and attempted to explain periodicity by the law of nervous impression,—viz., that long continued impression on a nerve of sense subdues its sensibility, and that change of impression restores it, endeavouring to show that when disorder is induced by morbid impression in one part of the circle of vital actions, the derangement of action which results in other associated organs produces a new impression on the nervous system, calculated to counteract the first, and restore to the nerve the power of being excited by its natural sensibilities in all its varied functions.

Having then shown that the first stage of disease is alike in ague and in cholera, it was argued that they are alike subject to the same effects or law,—viz., periodicity of action. Such was the theory of the disease then offered to you. Practically it was shown, that in ague and in cholera, the morbid impression always evinces itself first in apparent cessation of vital action in the capillary circulation, more or less general, and more or less complete, by a greater or less approach in the condition of these vessels to that of inanimate tubes or dead structure; that the vital changes on the blood in the terminal capillaries then cease, animal heat is not evolved, the blood instead of coursing freely through the minute veins, adheres to their coats, and instead of remaining fluid, assumes a half-coagulated condition, as if the interior coats of the vessels had lost a portion of their known power to maintain its fluidity; that the veins, instead of being gently distended, contract, as in death, and reject their contents. Such was considered the first condition of the cold stage.

It was then shown that the direct effect of this first

condition, and of the continued rejection of the blood from the capillary circulation, is its accumulation in the great sinuses and venous organs of the chest and abdomen, oppressing the action of the right side of the heart, deranging the circulation, and impeding the functions of the principal vital organs, and diminishing the quantity of arterial blood distributed to every part of the body; therefore, as upon this the life of the whole body depends, destroying vital action, and causing collapse and death.

But to this fatal effect of derangement of the capillary circulation and consequent congestion, it was shown that the system does not always submit without a struggle, although such is the history of those almost instantaneous deaths from cholera sometimes met with; on the contrary, when from the above cause the cavities of the heart and spleen are distended, (for I believe the spleen, with its sympathetic plexus and elastic structure here plays an important part,) the immediate effect is that produced by the distension of any hollow muscle,—viz., a stimulus to contraction. This becomes a source of excitement to the nervous energy of the heart, and through it to the sympathetic, in all its functions, and among others, to the resumption of its power over the capillary circulation.

It was shown that in ague the commencement of re-action is evinced in general convulsive shivering of the whole frame, then by fever, and then by return to natural action; but that in cholera the heart seldom experiences relief by simple re-action, without some mechanical aid to diminish the quantity of the blood thrust upon it from the extremities; that this is effected either artificially by bleeding from a vein, or naturally, by the exudation of the watery part of the interior blood into the mucous or serous tissues. It was stated that this mode of relief commonly, but not always, takes place from the intestines, by the watery diarrhoea of cholera, and is then either sufficient at once to relieve the circulation, and conduce to complete cure, or if insufficient for complete cure, it may be adequate to prevent the immediate death which would result without this relief to the congestion, and thereby permit the disease to reach its secondary stages; or, third, failing both these methods of relief, the power of the heart succumbs to the oppression, after which the morbid impression, unopposed by circulation of arterial blood, attacks the cerebro-spinal system, and terminates the struggle in convulsion.

Lastly, attention was invited to the fact that cholera, like congestive ague, has its diurnal periods of accession and remission,—that, therefore, extreme caution is requisite to avoid attempting to give relief at all times by the same means; for bleeding, which will relieve all the symptoms in the first hours of an attack, will produce the very opposite effect some hours later, unless we wait for the commencement of the new accession, when it will be equally applicable as in the commencement of the first attack.

It was also thrown out as a suggestion worthy of inquiry, whether cholera does not follow the course usual in quotidian agues,—namely, a tendency to run a course of three days' repetition of congestion, where

death or cure does not interfere, for in that case the return of the congestive stage will not be so much to be dreaded on the fourth day as consecutive fever.

In dwelling upon these points I was not so presumptuous as to hope that you would receive any one of them solely upon my individual statement, or even consider them proved by the arguments adduced. My intention was rather to state them as points, which, after much reflection and study of the subject, both in its general features and in individual cases, appeared to me to be those to which it was most important to direct attention both in reading and in practice; because, if we are convinced that the disordered action begins in the capillary circulation,—that the congestive stage and symptoms are direct consequences of this disturbance,—that this condition is not absolutely persistent throughout the whole attack, but goes through certain diurnal changes,—and that the general tendency is for the congestive stage to return on three successive days, and afterwards to run into more continued febrile action, we shall then have a clearer perception of what is wanted in respect of treatment at each particular stage of the disease, and can adapt our remedies accordingly; and from knowing what to expect, we are enabled to distinguish the effect of the remedies from that of the disease they were intended to combat.

I am aware that by many the theory of the disease may be considered to have been unnecessarily dwelt upon, especially in that part of it which attributes the effects to morbid impression on the sympathetic, but this appeared to me important with regard to diseases associated with cholera, and in reference to the *modus operandi* of medicines which are found to exert a beneficial influence, in very different, and apparently very opposite, conditions of the system, arising from the same malarious influence.

I have stated it to be the object of the present inquiry, to search for some enlarged principle for our guidance in the treatment of cholera, which the observation of individual symptoms only tends to confound; and it seemed absolutely necessary, before considering the means employed for cure, to inquire, as carefully as possible, into the essential nature of the malady, in order to comprehend distinctly the intention to be kept in view in administering medicine.

CONNECTION OF CHOLERA WITH OTHER EPIDEMICS, AND THE INFLUENCE OF ITS CAUSE ON THE CON- STITUTION.

We have hitherto considered the malarious influence by which ague, cholera, and remittent fever are produced, only in its physiological effects on the human body, with little reference to their epidemic character, and without attempting to fathom the origin or nature of the cause. The cholera atmosphere, as it has been termed, is generally believed to pervade chiefly the lowest levels of a tract of country, and I believe this to be correct; but it is singular, that one of the spots pointed out to me as most fatal in Persia, was elevated 10,000 feet above the level of the sea, another 8000, and another 5000; it is also said to follow chiefly the courses of rivers,—in Persia it has uniformly been

most fatal in the neighbourhood of the extinct volcanoes which crown the great range that extends from Ararat to Khorasan. Dr. Prout observed, that during the prevalence of cholera, the atmosphere was perceptibly heavier than at other times. In 1834, it was observed in the great London breweries, while cholera was at its height, that fermentation proceeded more rapidly than was usual, and of late an attempt has been made to connect it with certain remarkable electrical phenomena. Dr. Prout's observation has been verified, that during its prevalence a greater than usual tendency exists to the formation of oxalates in the urine. In both its invasions of Europe, its progress has been very remarkable, and not in the direct commercial route from India, having in its first advance adhered steadily to a course nearly W. N. W. from Hindostan; and its second was nearly identical, but with greater extension of its left wing, towards the south.*

Not only to medical men, but to the Government of every country through which cholera has passed, its progress has been a subject of great interest in reference to the question of contagion, ever since its first recorded outbreak in Lord Hastings' army in India, in 1817. But although none of the well-contrived barriers opposed to its advance by *cordons sanitaires*, or quarantine regulations, have yet succeeded in delaying its march a single hour, the question is not yet settled. The facts just alluded to all display the general pervasion of something unknown, which influences the physical as well as the animal world, but is wholly beyond the power of man to stay; and, did time permit, others might be added still more convincing, bearing upon the change observable in the features of disease, both in the animal and the vegetable kingdom, long before the actual appearance of cholera. If, then, the connection

* Without attaching much importance to facts which cannot explain the progress of cholera in other directions, I may mention as a contribution to its history in central Asia, that its first advance upon Persia in 1828-9 was preceded by terrific earthquakes in 1827-8, extending for some hundred miles around the extinct volcano Demawund; that there then succeeded a period of repose from subterranean convulsion till 1840, when a violent earthquake shook down a portion of Mount Ararat, and continued to convulse the country to the south-east of that mountain till December, 1843, when, for the first time in the historical period a new volcano burst out near Shoomacha, thirty miles to the west of the Caspian and perhaps a hundred to the north of Ararat. That in 1841-2-3 the whole tract of country between the mouths of the Indus and the Caucasus had been overrun with unaccustomed dysentery, pestilential fever, and in some places cholera, but after this eruption earthquake ceased and the country became comparatively healthy till 1846, when cholera again broke out with virulence in the same tract. Since then, the main line of the advance of cholera has been in the direction of the volcanoes of Iceland. I leave it to philosophers to determine how far it is possible that extensive chemical action beneath the thin crust of this earth, evinced by these earthquakes, may have had anything to do, either by disturbance of electrical currents, or the evolution of imperceptible gases, in producing so great an amount of disease, and in determining the main direction of cholera over the line of country which evidently overlies an immense volcanic tract, that extends in a direct line from Cutch, late the scene of extensive subterranean disturbance, over the Elboorz and the Caucasian mountains, towards the principal volcano of north western latitudes.

of these facts with cholera were better determined, and collected, it seems to be impossible to doubt, that the evidence of the existence of a cause, infinitely more general than mere contagion, would soon prove so conclusive as to set the question at rest for ever.

These are points, however, far beyond my depth, and foreign to our present object, which is practical observation of the facts which indicate the relation of cholera to other diseases, and to inquire what useful inferences may be deduced from them.

With respect to the epidemic influence of the cause of cholera in this country, a great change in the character of disease must have been remarked by the elders of the profession since its first advent; and it is notable to younger practitioners, that there is an obvious difference in the practice of the generation of physicians which is now passing from among us and their own,—those of the old school are much more stringent in the article of diet, more cautious of the use of stimulants, and altogether much more apprehensive of inflammation, than we of more modern days; it is also notorious, that tonics are now much more universally prescribed than they were five and twenty years ago. All this is attributed by some to *fashion* in medicine, but it is evidently not so. In the commencement of the present century, the prevailing fever was attended with high arterial action, and the more acute forms of inflammation were much more general, insomuch that the lancet, calomel, and antimony, were then the sheet-anchors of the practitioner; but since a few years previous to the first inroad of cholera, a great change has occurred, bleeding in fever is now almost obsolete, a much more generous diet has become necessary, and calomel is comparatively disused. Since 1843, the type of sporadic fever of this country has approached more nearly to that of the remittents of tropical climates, displaying an unusual tendency to relapse and to local congestions. Neuralgia has also greatly increased; and Bright's disease, and dropsy after scarlatina, &c., become more general. This particular type of fever has pursued so remarkable a course, that before submitting to you the account of the various forms in which it appeared in Persia in 1842-3, when obviously and essentially connected with cholera, I think it of some importance to trace its progress from India to this country, great part of which I have myself had the opportunity of witnessing.

In 1841, a fever of remittent and quotidian intermittent type broke out in Scinde, where it destroyed many of our best troops, alternating occasionally with cholera. Both proved severe in Caratchee: it spread through Beloochistan, and appeared at Bunder Abbas in the Persian Gulph, early in 1842; also at Yezd. It thence spread westward to Shiraz, and northwards towards Ispahan and Tehran, proving everywhere extremely fatal; but its further progress to the northwest was arrested for a time, on the high grounds of Sultanieh, by the setting in of winter. Next spring it resumed its course, overspread Aderbijan, Erivan, Georgia, and the whole shores of the Caspian, crossed the Caucasus, and was very fatal in Veronish in the centre of Southern Russia. I here lost sight of

it in November, 1843, but was not a little surprised to find it again in December, on my arrival in Edinburgh. It was there modified it is true, and displayed less of an intermittent character, but was fully characterized by other symptoms, especially the tendency to relapse, and the pale tongue. Late in 1844, it appeared in Manchester, especially in Ancoats, where it was very severe. In 1845, it became epidemic in Liverpool, somewhat more modified in type, and the fever of 1846-7 in Manchester, still preserved much of its peculiarities, especially in the frequency with which it was accompanied with jaundice, and in running a course of seven, fourteen, or twenty-one days, and relapsing at these intervals.

For nearly two years, the typhus fever imported from Ireland has rendered this type somewhat obscure, but within the last few weeks, beginning in the middle of September, the same form of fever has become again prevalent and very severe. This will suffice to shew that not only cholera has spread to us from the east, but that since its arrival the very constitution of our fevers has partaken of a similar oriental character, and that not fashion but necessity has demanded the remarkable change of practice alluded to. The best evidence that this is not an *imported* change is to be found in those fevers which arise sporadically from the decomposition of vegetable matters, for these always assume the character of the epidemic then prevailing; as when plague broke out in Oxford, caused by a collection of putrifying cabbages, in the reign of Charles the II., and the most exaggerated form of the type of fever we are now considering appeared in a farm-house in Peeblesshire, in 1846, caused by the decomposition of stable manure; so cholera generally makes its first appearance in the neighbourhood of cess-pools, and in the most filthy parts of a city, and judging from my own experience, I should think that ague of a quotidian type must have been remarked by many within the last three years in badly-drained houses. But it may be remarked, that the epidemic constitution of disease is not only displayed in the fevers of a country, but equally so in every aberration from health, and ever since the first appearance of cholera in this country, these have been such as to require a much more extensive use of tonic medicines. In proportion as the lancet has fallen into disuse, iron has come into vogue in another shape, for although seldom prescribed five and twenty years ago, except for chlorosis, in the form of Griffiths' mixture, the greater proportion of diseases are now treated with chalybeates, a perfect evidence to my mind, not of the influence of fashion, but of necessity, and offering, I think, good grounds for attributing to iron some especial influence over the effects of the prevailing epidemic constitution in this country. For, whereas, thirty years ago this was marked by a highly inflammatory tendency, what we have now chiefly to combat, is feeble and imperfect arterial action, and a great and general disposition to venous congestion, not only in fever but in other diseases.

The usual indication for the use of iron is a pale tongue, and this is a special characteristic of cholera,

also in quotidian intermittents and remittents, at particular stages. Its *modus operandi* is generally considered to be to increase the facility with which oxygen is absorbed by the blood, thereby aiding its transmission through the pulmonary circulation, preventing congestion on the right side of the heart, increasing the vitality of the arterial blood, and promoting capillary action in general, but it would also appear that iron exerts a peculiar, and perhaps independent, tonic influence on the nervous system; hence its effect in *tic-doloureux*, sciatica, and spasmodic affections, such as hysteria and chorea. Its use as an opponent to mercury is pretty well known, and in moderating congestion, and regulating secretion, in menorrhagia, amenorrhœa, and Bright's disease, while its wonderful effect on spleen disease produced by ague, is well known to East Indian practitioners. These considerations, which would each admit of extended comment, will serve as an introduction to what I have to say of my experience of its effects in the epidemics I have now to describe, beginning in forms very different from cholera, yet ending in that disease, and while their history will demonstrate their near connection with cholera, it will also exhibit the singular effects of iron in various disordered conditions of the nervous system produced by malarious influence, and in restoring their appropriate action to medicines whose operation had been disturbed by the same cause, especially that of purgatives on the intestines, and of quinine on the capillary circulation in general as an antiperiodic.

In our present ignorance of the *modus operandi* of medicinal agents, the efficacy of iron in counteracting deranged action produced by malaria in the several systems,—nervous, circulating, and digestive, over which the sympathetic exercises its controlling and combining influence, will be looked upon as little more than a curious fact, but as all the diseases I am at present about to bring to your notice occurred in a single year, between January, 1842, and January, 1843, the fact of iron having been found influential in all, must necessarily be taken as strong evidence of identity in the cause of those diseases to which it proved an antidote, and therefore strongly presumptive of a closer connection between tetanus, neuralgia, remittent fever, ague, and cholera, than is generally admitted.

The circumstance which first drew my attention to iron as an opponent to venous congestion, and to mercury, was a severe case of spleen fever, with much cerebral excitement; the symptoms were not such as to induce one to trust to a tonic medicine for the cure, and on the authority of Dr. Abercrombie I treated my patient with calomel, antimony, and salines. He quickly became salivated, an effect as readily produced in spleen disease as in Bright's disease of the kidney. Upon this he got alarmingly worse, fever and delirium increased, and he was only saved by immediate change of treatment to that recommended in Mr. Twining's work on "Diseases of Bengal,"—namely, the combination of sulphate of iron with purgatives. Under this course he quickly recovered from the salivation and fever, and by perseverance for a few weeks the spleen was reduced to nearly its normal size.

As enlarged spleen is the direct consequence of repeated dilatation of the organ by successive fits of aguish congestion, and as subsequent experience showed that purgatives uncombined with iron did not produce the same effects on the spleen, it seems a fair conclusion that the iron operated by opposing the acquired tendency to venous congestion. In my own practice, too, I did not find quinine exert that miraculous effect in diminishing the volume of the spleen which is attributed to it by American and French physicians, and which has been exhibited by experiments on dogs; on the contrary, it often produced irritative fever, which it never did in combination with iron. The probable reason of this difference in the results is, that I employed it most where the prevailing type of ague was quotidian; others, where the type was tertian, to which the effects of pure quinine seem more peculiarly appropriate.

The next experience I had of iron as a remedy of unexpected power was a very singular form of epidemic disease, that exhibited extraordinary disorder of the nervous system.

A few weeks before this appeared in Tehran a somewhat similar epidemic had prevailed in Bagdad, but there it occurred in the form of angina pectoris, destroying life in a few minutes by spasm of the heart, particularly where any organic weakness existed in the organ, and similar, it may be conjectured, to the attack of which Lord George Bentinck and the corpulent Mrs. Armitage appear to have died.

A notice of the disease in the forms in which I witnessed it, may be found in an extract of a letter from me to my late brother, published in the Twenty-sixth Volume of the "Medico-Churgical Transactions;" and mention of a similar disease, as occurring in Strasburg in 1842, is made in one of the numbers of the "British and Foreign Quarterly Review."

This disease might be described as an epidemic apoplexy or epilepsy; it was characterized in the slighter cases by sleeping of the hand and foot of one side, coming on periodically every night at a particular hour, and accompanied with palpitation of the heart, nervously excited pulse, and severe headache, but though periodical in its attacks, I could not distinguish anything resembling a cold stage or actual fever. In the graver cases it appeared as coma, with hemiplegia, or epileptic and tetanic convulsions, which, if mismanaged, ended in death, at the same time facial neuralgia was unusually prevalent; in fact there was scarcely a form of nervous disorder which this disease did not assume in the two months during which it continued to prevail.

In two of the earliest cases, misled by acute pain in the knees and shoulders, accompanied with great palpitation of the heart, I mistook it for rheumatism, with commencing carditis, and ordered bleeding, and calomel and opium. By this treatment the symptoms were much aggravated, but they subsequently yielded to repeated doses of iron.

It were difficult to say what induced me to try this remedy, but I fortunately hit upon it early in the disease, and there was not a single case among very many hundreds in which a few doses of iron did not

suffice to effect a permanent cure; whereas quinine, purgatives, blood-letting, and mercury, all did more harm than good, and if uninterfered with, the disease often continued to recur nightly for weeks.

In the treatment of this epidemic, the Strasburg physicians were less fortunate. It does not appear that they had tried either iron or assafoetida, and the conclusion came to when the epidemic disappeared was, that "nothing seemed to do good, but that upon the whole, more of those who were bled recovered than of those who were not."

This strange disease affords a good instance of a malarious poison producing its effects mainly on the nervous system, and a singular example of a disease so grave as to present symptoms which generally accompany only the most serious lesions of the brain, yielding completely and invariably to so simple a remedy as a drachm or two of sesquioxide of iron. There was here no remarkable change in the secretions, save that so long as it prevailed there was a general tendency to constipation, and nervous irregularity of the bowels, which I shall have to remark, as occurring again in a subsequent epidemic. For nearly two months while the disease lasted, I had occasion to observe that the action of purgative medicines was frequently either null, or it was unusually severe; but I soon found, that where I was giving iron at the same time, their effect became regular, and for some time I was obliged to combine iron with every purgative, in order to ensure its action, even in cases where there was no other symptom of the malady present.

After the disappearance of this epidemic in March, the season was unusually healthy, with the exception of a few cases of a low form of apparently continued fever, but I believe really remittent, of the same kind with that which afterwards became epidemic in Edinburgh, in 1843, and which exhibited an unusual tendency to relapse.

In August, having few cases of importance to detain me, I quitted our sultry camp, then perfectly healthy, on an excursion into the Elboorz mountains, and pitched my tent at an elevation of 10,000 feet above the level of the sea, near the summit cone of the extinct, but still smoking, volcano Demawund. I was surprised on my arrival to find the tribes already deserting these celebrated pastures, and moving off to the lower grounds, the reason assigned was, that fever and death were busy amongst them, and that they were fleeing from pestilence. I saw several of the sick, and believed the fever to be the usual typhus of the country, but thought it strange to find it in such a locality.

On my return on the fifth day to camp, I found about a dozen of our attendants ill of fever, one man being in *articulo mortis*, but he had newly arrived from the eastward, from which it appeared that this epidemic was spreading. He died comatose, with a black tongue, and symptoms that I now recognize as those of malarious poisoning, and which simulate effusion on the brain,* but which I did not then recognize as such, and

believed his fever to be the typhus, such as I had been accustomed to see in the five preceding summers in Persia, for I was not then convinced that eruption is diagnostic of typhus. In the other cases the tongue was thickly coated, all the secretions disordered, and I saw no reason to depart from the routine treatment by calomel, antimony, and salines, which till then had proved successful. None of my patients, however, improved under this system; on the contrary, they were getting worse, and one case seemed rapidly hastening to a fatal conclusion, from excessive vomiting and irritability of stomach.

At this time the Russian Embassy was without a physician, and my attendance was besought for one of the *attachées*, who was suffering from ague, to which, however, he had formerly been subject. Hitherto I had seen a great deal of ague in Persia, but almost always of the tertian type, which very rarely indeed resisted the effect of a few small doses of quinine after a purgative. In this case the first two fits were tertian. I prescribed, and promised immediate cure, but in place of cure the third attack took place on the fourth day, and others on the fifth and sixth, and the tongue became dry, glazed, and cracked, such as I had not seen it before in ague, but very like that which we see in the worst forms of nervous fever, without eruption, now prevailing in Manchester. My patient was encamped by the side of a stream, and under the shade of trees. Conceiving that this might be the cause of the unusual severity of the attack, I had him removed to a house on the top of a hill; still, however, he became worse, the shivering less decided, the fever more prolonged, and the stage of sweating and of intermission more imperfect. It was now rather a remittent or a continued fever, like those in our own camp, than an intermitting; quinine was evidently injurious, and I was hesitating whether to adopt the same treatment, with calomel and antimony, that I was pursuing with the others, when, on examining the *præcordia*, I found that there was much pain on pressure over the spleen; upon this I determined to try iron, in combination with quinine, and gave him pills, composed of sulphate of iron and quinine, of each a grain, combined with one-third of a grain of aloes, every two or three hours. I entertained, however, but little hope of his recovery, for I then expected the next accession to carry him off; it was, therefore, with no small surprise and satisfaction, that I found him sitting up next day at the hour which I had expected to be his last, and conversing with his friends. The tongue, which had been glazed and dry, and so deeply and painfully fissured as to prevent his speaking, had now become soft and moist, the pulse more free, and the shivering fit, which had been absent for the

with symptoms of effusion on the brain; but *post-mortem* examination proves these fallacious, and the only constant *post-mortem* feature is soft and friable spleen. Calomel and bleeding is the usual treatment, death the almost invariable consequence. I can confidently recommend rapidly repeated doses of quinine and sulphate of iron, of each a grain, with a drachm of sulphate of magnesia, in three ounces of water, as most efficient in the cure of this much-dreaded form of fever.

* This is identical with the fearfully fatal fevers of the Persian Gulph, which generally prove mortal very rapidly,

last two days, came fairly on, and he was well in a few days.

Returning to our camp full of the new light that had thus broken upon me, as to the nature of the fever which was now destroying hundreds in the neighbouring villages, and spreading with great rapidity, and to which this intermittent was evidently nearly related, I re-examined all my patients, and discovered in all, more or less tenderness in the region of the spleen or epigastrium, and on watching more narrowly distinguished the remittent type, which had hitherto escaped my observation, for I now perceived that all the symptoms became aggravated after three in the afternoon, and that an imperfect remission took place in the morning; that the tongue, which towards evening, and in the fore-part of the night, was dry, black, and coated, was soft and moist in the morning, except in the centre, and the edges pale and translucent. I pursued the same principle of treatment in all, by combining iron with quinine, camphor, aloes, salts, &c., according to circumstances, and adding venesection or leeches to the pit of the stomach in the worst cases, about the time which I judged to be the commencement of the stage of congestion. No sooner was this change adopted than I had the satisfaction of witnessing immediate improvement in all.

I must, here, however, mention the case of one of the table servants of the Embassy, who had for some days been affected with most obstinate constipation. I had given him castor-oil, senna and salts, calomel, calomel and jalap, colocynth, and croton, all in vain—nothing moved his bowels; and, disgusted with my inefficient treatment, he betook himself to the native practitioners in town.

After two or three days spent in the repeated administration of enemata, only one very small evacuation had been produced. I encountered this man on my return from the Russian camp, looking wretchedly ill, and in complete despair. I now remembered my former experience of combining iron with purgatives, and gave him ten grains of jalap powder, with one scruple of oxide of iron, which relieved him perfectly, and afterwards a grain of sulphate of iron, with three of aloes, always operated freely on his bowels.

At the time of which I have been speaking, while my Russian patient was so ill, I was called to see a poor French girl, whose father was a general in the Persian service, and encamped in a damp and thickly-wooded orchard near the town, about seven miles from our tents. She was apparently suffering from dysentery, passing blood and mucus, the skin hot, and pulse about 130. I treated her according to the Calcutta practice as given by Mr. Twining, with ipecacuanha, blue pill, and extract of gentian, in which my experience of the fatal dysentery of the preceding year had given me the utmost confidence. No improvement, however, took place, and it appeared to me that there was no resource but to bleed from the arm, for I had frequently proved the efficacy of venesection even in the most reduced cases of dysentery without meeting with a single untoward circumstance to make me dread its effects; my surprise and dismay were therefore great, when, as

soon as a few ounces were drawn, she became faint and collapsed, and the body mottled, blue, and cold. It was only now that I learned by cross-examination of her attendants, that in the first commencement of her illness she had had one or two shivering fits, and since then had each night become extremely cold, but without shivering. I had hitherto unfortunately only seen her in the forenoon, when hot and feverish, and none of the symptoms led me to suspect ague, which was not as yet prevalent. She revived a little by the use of stimulants, and I then left her, being called away to another patient, where I was detained so long that the city gates were shut, and I was prevented from visiting her again that night.

The patient I was called to was a man of some importance, who had been out on a hunting excursion the day before, and had slept by the side of a stream. He was awakened by excruciating pain along the spine and in the chest, so severe that he could scarcely breathe; the pain was now most in the epigastrium, and so acute that he could not bear the slightest pressure; the agony appeared too acute for inflammation; and other evidences of pleuritis and peritonitis were wanting; the skin was warm, and the pulse small, contracted, and very rapid. Much at a loss, I gave a large dose of morphia, and exhausted every means of allaying the pain, with the intention of awaiting further symptoms, but the pain continued to increase until about midnight when the difficulty of breathing became so extreme that I determined to bleed him; blood flowed freely at first, but scarcely had four ounces been drawn when it suddenly stopped, coagulating, black, and tarry on the wound. He instantaneously became blue and mottled, and was seized with terrific tetanic convulsions, bent backwards nearly double in opisthotonos, and in a quarter of an hour he was dead of cholera.

It was not till next morning that I learned that my poor French patient had died at the same hour, with exactly similar symptoms.

The two cases I have detailed were the first of the kind which had occurred, and first pointed to what the epidemic I was dealing with was tending, and made me aware of the fatal mistake I had committed in both; for I had bled late in the hot stage of what might be considered an intermittent, and brought on collapse by the very means which, if used in the antecedent period of commencing congestion, might possibly have insured safety.

I was not mistaken in believing that the epidemic character of disease which now spread rapidly and extensively over the whole district, was but a modification of Asiatic cholera, to which the fresh cases which occurred became daily more and more assimilated, until the various divergent forms for a time merged completely into cholera, as it has everywhere appeared. In all these different forms it was an invariable feature, that if periodicity was to be traced at all, it was always accurately quotidian, and this was the case in a very large proportion of the sick.

I shall not detain you with a detailed account of the various forms of disease allied to cholera which then

prevailed, because I have already published a synopsis of them, in the 32nd No. of the *British and Foreign Medical Quarterly Review* for 1843, under the title,—“Epidemic Ague of Persia, a Species of Cholera.” The character of disease was greatly varied, both in intensity and symptoms, appearing as simple tic-doloureux, and intermitting hemicrania; paralysis, general or partial, of every part, and in every degree; in congestion of the brain, simulating apoplexy or epilepsy; in shivering ague, or ague without shivering. By and bye this form was more frequently accompanied with vomiting, purging, and cramps, so as to constitute, in every respect, an intermitting cholera; whereas others had attacks resembling cholera in every particular, except that instead of the more usual exudation from the bowels, this took place by the abundant out-pouring of the fluid of the blood from the skin, or sometimes into the cellular texture, either of whole or part of the body, producing either partial or general dropsy in the course of a few hours. This latter form was more especially frequent in infants and children. Sometimes, too, this serous exudation occurred in a form not less rapidly fatal than the worst kind of cholera, by producing suffocation, in consequence of sudden œdema of the lungs. All these however, and various other anomalous affections, at length gave place to cholera in its ordinary form, with vomiting, purging, and spasms, as little marked by intermission as it ever is, and differing in no respect from that I had witnessed in Edinburgh and London. Its temporary disappearance was then followed by the return of remittent fever. In every one of these forms, however, the urine was invariably scanty, and of a dark porter colour, or wholly suppressed. In its second onset two years afterwards, cholera did not approach so gradually, but after having indicated its advent by a few cases of cerebral congestion and sudden death, it fell at once upon the population, with all the fatality with which its first arrival is everywhere characterized. Suffice it to say, that in all of these I found the same principle of treatment hold good, and even the same doses of a combination of iron with quinine, together with a careful use of bleeding in the commencement of the congestive stage, universally applicable; whether in the slighter cases of mere nervous affection, in the more decidedly periodical forms, or in those graver cases including true cholera, where the congestion was evidently too extreme to be within the power of medicine to overcome, without the mechanical aid afforded by the use of the lancet, and where the stage of intermission was only to be discovered by calculation of the time, and the most minute investigation.

I shall conclude this division of the subject by the bold assertion, as it may seem to many, even of those who have witnessed cases of the description I allude to, that within the last few weeks, commencing from the middle of September, several cases of quotidian congestion of the brain or other organs, so grave as to threaten life, and sudden unaccountable deaths from affection of the heart have occurred in Manchester, and I believe all over the country; and that these are attributable in my opinion, solely to the already

prevailing tendency to venous congestion, and nervous disturbance proceeding from the cause, and perhaps preceding the actual appearance of the more obvious forms of cholera. The cases which I have myself met with lately of this character, have been total insensibility, resembling apoplexy, with extreme collapse, return of warmth, and again a stage of collapse on the following day; also hemiplegia without other symptoms of apoplexy, both yielding to quinine and iron; intermitting hemicrania, neuralgia, unusual pain and tension of the epigastrium, pains resembling rheumatism in every part of the body, aggravated by the usual treatment for rheumatism, but relieved by iron, and often accompanied with cold chill at a particular hour each day; also sudden attacks of vomiting and purging without tenesmus. These I shall probably have an opportunity of bringing to the notice of the profession in another place; my object here is not to detail cases, which others must have met with as well as myself, but by sketching the course of these diseases generally, to show how maladies, that, taken separately and without reference to the prevailing epidemic character appear to differ in every possible symptom, may yet be found when regarded *en masse*, to be very intimately connected.

I have been particularly desirous that your attention should be directed by the history I have just concluded, to the fact, that in every form of disease there mentioned periodicity has been a prominent characteristic, and that though obscure in remittent fever, in actual cholera and in some nervous affections, the close connection existing between them and decided quotidian ague in contemporaneous occurrence, sequence, and in their essential symptoms and means of cure, would scarcely admit of a doubt that periodicity exists in these also, even if it were more difficult to distinguish in practice than I have found it to be.

There is another point which can scarcely have escaped your observation in these forms of disease,—viz., the great variety of effects produced by the same exciting cause. Now, on the brain and nerves, with various, or without any, remarkable disturbance of the circulation;—now, on the bowels by constipation;—now, by diarrhœa;—now, by dry vomiting;—on the capillary circulation generally in ague, remittent fever, and cholera;—or locally, by arrest of certain secretions, or by exudations from the compressed and congested blood into a great variety of structures, &c., &c., for this alone I conceive would suffice to show, that such diversity of effect without a single constant concomitant, such as fever, could never be the result of altered blood without nervous impression, and functional disorder.

The invariable efficacy of iron in all these forms of disease, whether simply or in combination with quinine, will also, I think, sufficiently illustrate what it was formerly attempted to argue, that the different conditions of the nervous system and of the circulation, occurring in agues of different type, require a different action in the medicines by which the morbid influence is to be counteracted, according to the type or duration of intermission; for, in speaking of ague, it was remarked, that in quartan the febrile stage is greatest,—

that in tertian all three stages are well developed,—but that in quotidian the congestive stage is always the most severe, sometimes even to the exclusion of the others;—that, in proportion as the intermission is prolonged, the congestion is less severe, and the energy of arterial reaction more powerfully excited; but, as the cession of the vital powers to the morbid impression becomes more complete, the period of repose is curtailed, the febrile stage less perfect, and capillary action more impaired, especially in that part of it which belongs to the venous system. Thus quinine, which almost invariably cures tertian, is often found inferior in effect to arsenic in quartan, and in quotidian we have found it prove positively injurious till modified by admixture with iron, by which its ill effects were obviated, and its antiperiodic action restored,—a fact of no small interest in explaining the failure that has always attended the attempts to treat cholera with quinine and arsenic uncombined.

(To be continued.)

OBSERVATIONS ON CHOLERA.

By E. T. ROE, M.D., Plymouth.

The fertility of the human mind has never been more fully exemplified than during the last few months, in the host of remedies proposed for the cure of cholera, that dread malady which has been seen advancing upon us from barbaric realms in slow and measured step, unsated by the destruction of vast heathen hordes,—unchecked by human laws,—unknown as to its essential principle or mode of propagation; its onslaught sudden, fearful, deadly; its election of attack often governed by no circumstance of wealth or power, or health or situation; the young and old, the vigorous and feeble, alike drawn into its cold embrace. The malady indeed is of sufficient importance to demand from all of us the most serious prayerful consideration, and it is to be regretted that the mind should be distracted from its rational contemplation by crude and ill-digested, ill-judged, or reasonless surmises, and suggestions,—that it should allow itself to be led away by every new or startling theory, which “like the baseless fabric of a dream,” vanishes when the mind resumes its throne. Every tyro knowing cholera only from books fancies himself propelled by an internal force to rush headlong into print, and give his lucubrations a local habitation and a name, and himself the practice he has vainly sought by other means, while maturer minds are racked with indecision, filled with fancies, and blown about by every wind of doctrine, hesitating and halting in opinion between carbon and creasote; naphtha and petroleum; calomel and opium; salt and mustard; and discarding all in their turn; and the astonished public looks on aghast, until, recovering from its surprise, it asks, “What are the doctors doing?” “How is it that they have found out no remedy for cholera yet?” Alas! God in His infinite wisdom has decreed that plagues and pestilences shall, at certain periods, devastate the earth, and that the hand of man

shall be powerless against His will; but at the same time he gives us reason to view his judgments aright, and he mercifully permits us to use the agents he has given us, and which He, in His good time, will deign to bless. He has shown that He is not unmindful of those who are not unmindful of Him, and this favoured land can boast of sharing largely of His blessings. Had we done as we should have done in times of peace and plenty, and thought *then* of our poorer brethren, of their crowded rooms, their drainless courts and lanes, and the poisoned air they breathe, the measure of His grace would, perhaps, have been larger; but now, with the disease almost at our thresholds, we set about to put our towns in order for the poor's sake! Shallow hypocrisy: it is for our own, for we dread, and justly too, that if the poor have the disease, the rich will not escape.

With these preliminary remarks I will proceed now simply to the consideration of the best means of treating the *developed* disease, leaving to a future occasion any speculations as to the nature of that disease, as well as the questions of what should be done in the way of public hygiene, and what, in the various phases of general malaise, which are supposed by an alarmed and excited public to be the initial stages of the epidemic.

I will not insult my readers' understandings, nor occupy their time in combatting the various absurd theories indulged in, both in this country and elsewhere, nor chronicle the remedies based upon such fanciful and erroneous opinions, but pass on to notice briefly some of the most rational and well-devised plans which have been proposed, and which offer the greatest probabilities, humanly speaking, of being attended with success, and will then, as briefly, give the result of my own experience.

The scheme of supplying to the blood, by transfusion, the salts which had been drained from that vital fluid by the discharges, was, perhaps, one of the most taking promulgated during the last epidemic, but it has hitherto been found to be productive of only temporary rallying, not of permanent relief.

Carbon and carbonic acid, creasote, naphtha, and petroleum, may be classed together, and need not occupy us long. Each has its advocate, and there may arise cases in which each may effect a cure, but they do not come up to my idea of possessing sufficient energy to arrest the progress of so stern a malady as cholera.

Dr. Parkyn is an able supporter of the claims of carbonic acid in effervescence, and if it be found to check the vomiting, it will be valuable as an auxiliary remedy.

Brandy, cajeput, capsicum, and essential oils, have been found to relieve the distressing cramps, and rouse the vital energies for a time, but to how much of their influence may we ascribe the subsequent inflammatory re-action, often as fatal as cholera itself?

Other agents, as alkalies, salines, acetate of lead, mustard emetics, &c., are also recommended, but all sink into the shade, or become at best only of secondary importance when compared with calomel, opium,