GENERAL OBSERVATIONS

RESPECTING

CHOLERA-MORBUS:

BY

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"Un plan sistematico es un plan absurdo. La naturaleza no conoce estas normas; inventar un sistema y buscàr pruevas es un delirio; observar efectos y deducir causas, esta es una CIENCIA."

F. VARELA, "*Apuntes filosoficos.*"

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SEÑOR DON THOMAS ROMAY, M. D.

PRESIDENT OF THE MEDICAL BOARD OF THE HAVANA,
ISLE OF CUBA &c. &c. &c.

To whom with more justice than to you, Sir, ought I to dedicate this small fruit of my labours? The more I look back to the length of time during which you have honoured me with many marks of kindness and regard, the more obliged and grateful do I feel to you, particularly, for the services that you have been so kind to render me in the beginning of my medical career. Since 1827, *when I left the* HAVANA, *up to the present, I have travelled through the principal cities of Europe, and almost through all* ASIA. *In the different parts of the latter where I resided (the principal are* MANILA *and* CALCUTTA,) *I have had frequent opportuni-*

ties to observe the most remarkable phenomena peculiar to Cholera-Morbus, which has unfortunately spread itself in so many and distinct climates; and which is still going on, causing ravages not only in that Island, but in the South and Western parts of these States. The desire of being useful to humanity is what induces me to publish these observations, which I hope will prove serviceable, as they contain a new treatment for that disease very different from any hitherto put in practice, and which has obtained more success.

Under these considerations, I beg you will accept of the dedication of them as a small testimony of my deep gratitude, and believe in the sincerity of the affection and respect,

With which I am,

Sir,

Your very devoted servant.

J. N. Casanova.

New-York, July, 1834.

INTRODUCTORY REMARKS.

THE difference of opinions among medical men on the most important questions regarding CHOLERA-MORBUS, is a sufficient evidence that there is but little known concerning it. For my part I do not pretend to set those opinions aright, by producing a new one that might, perhaps, be as obscure, or as absurd as those which prevail at this day. For the present I shall only direct my observations to point out the errors that have been committed; first in describing several phenomena peculiar to that disease, in a manner rather ambiguous; second, in having mistaken some apparent objects for real ones; and third, in having established a therapeutical method by far too exclusive: and to state what appears

to be the most reasonable condition of the particular state of the subject of each of those questions, and the most probable facts about them. In bringing forth my assertions I shall endeavour to set down nothing but what I have seen, and what appeared to my understanding "*to be or not to be.*" Should this mode of investigation be considered as an attempt to close the scene of discussion by a new discovery, I beg to repeat that my pretensions do not extend so far, though I may bring to notice some remarks that, perhaps, will throw some light upon the subject.

N. B. The first outlines of the following observations were originally written in an epistolary form, and addressed to the Medical and Physical Society of Calcutta, through its Secretary, W. Twining, Esq. (*December* 21*st*, 1833.) At the time of my departure from that country, (*January* 25*th*, 1834,) they had

not yet been presented to be read and dicussed at the said Society, for the members were not to meet until the first Saturday of the following month. Since that time, having many materials in my possession, I undertook to correct my former paper, and to compose the present book by adding a considerable number of facts on the subject, and a second series of clinical observations, which will be found at the end. If some peculiarities of style and arrangement are observable in it, it must be borne in mind that I am a Spaniard, writing in a foreign language, and that the sole object in giving it to the public is that of making myself useful to suffering humanity. "*Non est bonum vivere, sed bene vivere,*" said SENECA, giving us to understand that we must not live for ourselves alone, but for the benefit of mankind.

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"In no science is the pure inductive mode of reasoning more important, and in no science perhaps is it less observed, than in that of Medicine."—*United States' Med. and Surg. Journal, page* 24.

FIRST SECTION.

GENERAL OBSERVATIONS.

FLOGISTICAL, NEUROLOGICAL, RESPIRATORY, CARBONICAL AND CONGESTIONAL DOCTRINES EXAMINED AND CONFUTED.

Chapter I.

FLOGISTICAL DOCTRINE.

Preliminary observations.—Definition of the words SEAT, NATURE, and CAUSE.—Is the stomach and intestinal canal the seat of Cholera-Morbus?—Are the morbid appearances found in them *a priori* or *a posteriori*?—Is the discharge of the stomach and intestinal tube an abstraction of the fluid portion of the blood?—Definition of the words *Ab-* and *Sub-irritation*.—Conclusion.

THE principal points which have baffled the endeavours of many intelligent and ingenious writers with regard to the disease generally known by the names of CHOLERA-MORBUS, CHOLERA SPASMODICA and CHOLERA ASPHYXIA, are as follows:

1st. The seat of the disease.

2d. Its nature.

3d. The cause that produces it, and

4th. The proper means of arresting its progress.

To prevent the propagation of errors by an improper use of words, I beg to be well understood. I mean by the word *seat* the organs or functions that are primarily seized, and that their mode of suffering does not depend on, nor proceed from, any other affection.

The word *nature*, having many acceptions in all philosophical inquiries, I beg leave to observe, that in the present case it denotes both the pathology and the physiology of the disease, *i. e.* the manner in which the affected organs or functions suffer. Whether from a superabundance of vital energy, or from a deficiency of it. In fine, I comprehend by the word *cause*, the poison, or the deleterious agent, which produces the first morbid impression on the human body. The influence which all the improper expressions have

in creating errors, is obvious. The terms *proximate, immediate, efficient,* and *essence* have been substituted for the more comprehensive term, *poison;* and the morbid appearances found in the dead bodies have been taken for the *cause*, when we know that such derangements have no more manner of immediate efficiency in producing the disease, than the sun has in producing the efficient cause of darkness, though the darkness succeeds the setting of the sun. In the first case we ought to consider that phenomenon as an effective *cause;* and in the second as a deficient *cause.*

The fourth point speaks for itself, and requires no explanation. But to the matter.

Many treatises, many essays, many histories, and many, many more dissertations and memoirs have been written on the subject by physicians of both hemispheres, but not one has yet found the great secret. Not one has yet given a satisfactory account on any of the points above stated; and it seems that the present state of Medical Science does not admit of better information. Errors

over errors, hypotheses over hypotheses, and conjectures over conjectures, have multiplied and accumulated themselves into the heads of eminent inquirers: they have been put forth and now remain in the annals of the present day, and for the time to come.

"Litera Scripta manet."

Will this be the everlasting state of medical knowledge with regard to Cholera-Morbus? I most sincerely hope not.

We must, nevertheless, except from the above remarks the worthy works of Mr. Twining of Calcutta (*on the diseases of Bengal*), and Dr. Hays, of Philadelphia, (*on the Pathology of Cholera-Morbus*): the first is the most accurate practical book yet written; as the author had the best opportunities of observing the disease in its own field, and an uncommon genius for clinical observation, could not but succeed in giving to the world the veridical fruits of his labours. The second, is, without any exception, the best theoretical essay on the subject: it is princi-

pally founded on the spirit of the flogistical doctrine; and contains many good pathological axioms. His investigations are explained with method, good style and skill. Had this distinguished physician not taken such an exclusive view of the general points on the subject; and had he seen as many cholera patients as he has seen cholera works, he would undoubtedly have left nothing to be desired. But to return—

Were I to be questioned on the first point, viz; which is the seat of Cholera Morbus? I do not know, would be my answer.

"Nec me pudet, ut istos, fateri nescire quod nesciam."

Nor is any one better informed about it than myself. Again, which is its nature? my answer is that when the disease is unconnected with any other, its nature is spasmodic; and that the affected organs, and functions, suffer from a deficiency of excitement and vital energy, as I will more distinctly explain in further investigations.

It has been supposed, no doubt correctly, by different writers, that the principal seat of the disease in question, is,

1st. The stomach and intestinal tube.

2d. The nervous system. While others consider it to be :

1st, a chemical phenomenon of the lungs, or a decarbonizing power of the respiratory function ; and

2d, an hypercarbonation of the veinous blood.

"Quod homines, tot sentenciæ."

Thus we find the opinions divided ; some place the seat of the disease in organs, and some place it in functions. Were I asked for the names of the writers who have so much varied in their opinions regarding the present questions, I would answer the same demand by a reference to the records of our Medical and Physical Society, and to the European and American works, with which every studious physician must be acquainted.

The votaries of the flogistical doctrine, that is to say, those who consider the disease

to be a local inflammation of the stomach and intestinal tube or an "intense gastro-enteritis;" and the neurologists, have endeavoured to make it the subject of anatomical, pathological and physiological researches; but unfortunately their statements do not correspond with the great book of nature; whilst the other advocates have made their inquiries the subject of chemical experiments.

"Fere libenter homines id quod volunt credunt."

Neither have any of the above sectaries, ever succeeded. Virtually they have sought the object of their investigations and found nothing but visions: I speak from personal experience, acquired in the several places of Asia where I have been. I have more than once witnessed their attempted experiments, and engaged in them myself with equal interest and disappointment. They were tried on the living subjects during the different stages of the disease, and after death. But they were tried to no purpose. The phenomena of inflammation, affection of the nervous system, lungs, or respiratory function; and

the hypercarbonation of the blood, are not as uniform in their march, or existence, as it has been supposed. Nor are they as universal during life, or after death. Every well informed practitioner is satisfied of this being the fact. Neither those phenomena, or any one in particular, supposing to exist in every individual uniformly, cannot be ascribed to the principal seat nor to the cause of the disease in question, but to a mere effect of the deleterious agent, be it what it may, or to the improper use of cathartic or drastic purgatives, taken on or about the time of the attack. (See Appendix, No. 1, observations 1 and 2.) Pathologists having taken the symptoms for the disease, the disease for the effects, and the effects for the cause, and *vice-versa*, fell not only in the most professional absurdity, but in a great logical error.

"Hominis errare, insipientis vero in errore perseverare."

I have not seen one single case of real *Cholera-Morbus* accompanied with gastritis or gastro-enteritis, excepting in the cases above stated, or when the patient has been

labouring under an habitual diarrhœa, or a dysentery prior to the invasion. (See observations 3 and 4.) Nor has any one; and the reverse of this is not a medical fact. We know that the greater part of individuals more subject or predisposed to this disease, are persons whose habits are not in accordance with the most reasonable precepts of public hygiene: that they do not observe a salutary regimen of diet; and that their gastro-intestinal mucous membrane is constantly in a state of ab-irritation from the excessive use of spirituous liquors, (See observations 5 and 6,) and from the indulgence of indigestive food and condiments; and that under these particular circumstances we are sure to find the stomach and intestinal tube more or less affected, but not otherwise.

"All I relate I have seen."

The symptoms which sometimes appear, announcing a disorder of the digestive canal, in subjects not labouring under it prior to the attack, are really indicative of such a disorder; but is this derangement to be considered as a primary, as an exclusive, or as an essen-

tial lesion of that part? Certainly not. It cannot be considered otherwise but as a mere link of the great chain of sympathies to which every function, and every organ are subject; and the morbid appearances which are sometimes found in such subjects after death, are either the immediate effects of a metastasis, performed during the pathological action of some system, or the results of an inappropriate therapeutical method.

The celebrated Dr. Hays, in his speculative attempts to discover the real seat of the disease, and to show which are the organs primitively affected, brings on an argument, supported on Morgagni's theory, respecting the "Seat and causes of diseases," which tends to persuade that Cholera is an inflammation of the bowels; though it is intended to explain the cause of the sinking of the circulation, and the thickening and viscidity of the blood, and is as follows: "The sinking arises from two causes: 1st, The Choleric evacuations suddenly and largely diminishing the amount of the circulatory fluid must, like profuse hæmorrhages, weaken the action of

the heart; and 2d, The thickening and viscidity of the blood caused by the abstraction of its fluid portion, must present a mechanical obstacle to its circulation." This is no doubt a very good and able argument; but let it be placed in its own sphere. It can, with more propriety be applied to those diseases which have some similarity to real Cholera-Morbus, though produced by different causes, and wherein the deleterious agent, acts directly and exclusively on the mucous membrane of the intestinal tube, in which it causes the profuse ejection of its contents and the superabundant excretion of its mucous and membranous fluid, to which naturally follows that diminution of the circulation; that thickening and viscidity of the blood, and in fine that well marked mechanical obstacle of the circulatory function. But where is the proof that Cholera-Morbus is produced by a similar agent? and that such an agent carries its absolute sway directly into the digestive laboratory? Such a proof has not yet been given. If it has, I do not know where it is to be found.

The sinking of the circulation, in cholera patients, and the weak action of the heart, precedes the choleric evacuations. This is a practical fact which I have almost invariably observed: it cannot escape the eye of a close observer if he takes the proper means of exploration in the early stage of the invasion. The thickening and viscidity of the blood, can invariably be discovered long before the supposed abstraction of its fluid portion: this is another indisputable fact. Then the profuse evacuations are not the cause of the sinking of the circulation. Nor does the supposed abstraction of the fluid portion of the blood, cause its thickening and viscidity. Chemical analysis of the choleric evacuations have satisfactorily proved that *there* is not a component part in them similar to that of the fluid portion of the blood: then the deleterious agent which produces Cholera-Morbus does not act in the human body in the same manner as those poisons that produce a disease similar to Cholera. Nor does it carry its destructive power primarily into the intestinal tube, but through the great sympathetical chain; then

the morbid appearance found in that part of the body is not the cause of the disease in question, but an effect. Were I to be asked how then, or by what physiological action these phenomena of the circulation are produced? I will answer the demand in its proper place. Again; how such a discharge of the intestinal tube is originated or produced? By the anomalous aberration of the blood from the circumference to the centre, leaving almost all the capillary vessels of the mucous and membranous tissues in a state of vacuity: This is my answer, which no physiologist can controvert. The intestinal tube being thus affected, it follows, that a secretory action of its mucous membrane is considerably increased; being deprived of blood to support its physiological want, it supplies itself with its own gastric juice. From hence a sub-irritation is established and the excretions of the fluid substance (serous) succeeds the discharge of the alimentary materials (if any) which have not yet undergone the process of digestion. Should my assertions not be considered as a sufficient evidence of the subject in question, I re-

quest the reader to peruse Dr. Hays' own remarks on the same subject, which are as follows ; "We have considered the choleric fluid to be the product of an exaggerated secretory action, and not a simple leakage from the vessels: and the correctness of this view is fully sustained by the character of the choleric fluid. If this fluid was the result of a mere leakage from the vessels it would consist of the fluid portion of the blood unaltered, now this is not the case ; all the analysis show that it contains an excess of saline materials, and the analysis of Dr. Christie and Dr. O'Shaughnessy, show that it contains febrine; and it has been equally found that the blood is deficient in these matters. The choleric fluid is then an elaborated one, and must be the product of a secretory action, whilst the presence of febrine equally proves that this action is an active or an inflammatory one* the

* Dr. H's opinion and meaning of the word "Inflammation," is no doubt what is called by the old school *Stenia*, the reverse of *Astenia*. I judge from his advice for the treatment of such an "inflammation," with anti-flogistics. As I made use of the words "*ab*," and "*sub*-

effusion of febrine being the strongest possible evidence of such an action."

Dr. H. speaks, no doubt, of the Cholera which prevailed in the U. S. A. and in Europe.

Now let us hear *Mr. Twining's* recapitulation of his experiments on the East-Indian Cholera. "Without entering into minutiæ, concerning the conclusions deducible from the

irritation" in the foregoing pages, I beg to be well understood, and therefore shall proceed to explain the meaning of each one: "*Sub-irritation*," according to its true etymology, is the reverse of *ab-irritation;* the former denotes that state of the human constitution in which there is a deficiency of vital energy, and a general want of excitement: and we comprehend by the latter, the superabundance, or excess of the said vital energy.

Since the true physiological doctrine has made its way into the enlightened schools of the present day; we find greater facility in explaining the worthy axioms of Dr. Broussais, in which he shows how an organ or a function can be affected by either of these two physiological laws; whether it suffers by a defect of vitality, or by an excess of it. Either of these states can be called "*irritation*," and the only distinction to be made in describing it, is by prefixing the syllables *ab*, or *sub*, in their respective cases. We may, with the same propriety add to the word inflammation, the substantive *Stenia*, or *Astenia*.

above;" (he alludes *to the results of his experiments*) "it is evident that the subalbid evacuations, called the true cholera stools, does not consist of the serum of the blood, as some authors have stated. I have found the conjee stools not coagulable by heat when the blood of the same patient has separated a small quantity of serum, which has coagulated firmly on the application of heat. The occasional indications of an acid in the cholera evacuations, while we know that uncombined soda is generally found in serous fluid, would be an additional reason for our not acknowledging the conjee stools to be the serum of the blood."

And again, in another place, speaking on the same subject respecting the nature of the materials voided from the stomach by vomiting, says: "To avoid probability of erroneous conclusions, I have tried similar tests on the various kinds of food and drink allowed to cholera patients; so as not to mistake the effects of the tests on any of these articles, for their effects on the secretions of the

stomach and intestines." I have myself performed several experiments of the kind with the same success; and having analyzed the blood of many subjects, dead of the real Cholera-Morbus, taken from their bodies from 4 to 12 hours after death, I have invariably found in it the same proportions of serum as those generally found in that of healthy persons.

My object in having quoted the above facts is to prove the correctness of my assertions respecting the action of the deleterious agent (or the poison producing Cholera) in the human body. They evidently show that it is not the intestinal tube that first receives the morbid impression. Were Cholera-Morbus of the same nature as those diseases mentioned by *Morgagni*, that neither depend on, nor proceed from another, the fluid portion of the blood, no doubt would, in every instance be detected by the chemical tests.

Chapter II.

NEUROLOGICAL DOCTRINE.

Have the advocates of this doctrine succeeded in their attempts ?—Is the nervous system the first affected ?—Comparative Proposition.—Conclusion.

"Hic patet ingeniis campus."

Nor have I found in the nervous system that phantom which has so often been in contact, not with the scalpel, but with the imagination of many Indian and Ultramarine anatomists. The catalogue of their opinions is so voluminous; their details so many, and so diverse, that it would require a forty-pen power to condense them into a reasonable space. Nevertheless, I shall endeavour to keep myself within the limits of the subject in view.

Those who have thrown their anchors of hope into the great sea of the nervous system, in order to support their ingenious arguments, have not been able to hold a good ground; consequently all their hypotheses and

conjectures went adrift and perished in the storm of their own discussions. Had I not witnessed their attempts, I would not venture to say that the nervous system is the main grave where all the medical difficulties are buried. Whoever undertakes a close examination of the subject will find that the nervous system (in Cholera-Morbus) is nothing more than the conductor of the disease ; that it is very seldom affected at the commencement of the invasion, and very often, or most always, at, or about, its fatal termination. In the first case its affection is of little duration, and of no importance ; in the second it becomes of as great a consequence as the greater has been its connexion with other secondary derangements.

Can it be compared with the conductor of the electric fluid of a building that receives the gust from the atmosphere and carries it to the ground, where it strikes and disappears, causing a greater or lesser damage as the greater or the lesser is the resistance opposed by the stricken body ? Let us suppose that the inferior extremity of the conductor is connected with the building (as the nervous

system is with every part of the human body) instead of being thrown in a vacuity where no mischief can be apprehended; and that the electric fluid in passing through the rod strikes the building and throws it down; in this case the building as well as the conductor are materially affected; the former primarily and the latter secondarily. Consequently its downfal must cause as greater material damage to the conductor, as the greater is the demolition. Thus is the nervous system affected; and the presence of its morbid appearance during life does not constitute the *seat*, nor the *nature* of the disease. Nor does the absence of its affection after death denote that it has not been assailed. This is a practical fact. Every physiologist knows that the cessation of life causes considerable changes in the principal functions of the organical life of the human mechanism; and that many phenomena which existed during life are apt to disappear after death. The reverse of this is also true.

Chapter III.

RESPIRATORY DOCTRINE.

Is the decarbonizing power of the lungs essential to the disease?—Does respiration depend on the supposed deficiency of Oxygen and Carbonic Acid Gas?—Or on the disturbed state of the circulation of the blood?—Conclusion.

The chemical notion respecting the deranged state of the respiratory function, deserves perhaps, a passing notice. It is that which attributes Cholera to be a decarbonizing power of the lungs. This again, I say, is as empty a conjecture as has ever issued from the dreams of a visionary. It is true that there is a deficiency of carbonic acid gas in the air expired from the lungs of patients who are found in a state of prostration, with low pectoral voice, feeble pulse, and cold extremities; and that such a deficiency has been found in some instances very low. But it is also true that this phenomenon is not peculiar or exclusive to Cholera. That it exists in many other diseases at their commencement, and approaching state of death

cannot be denied. But let us suppose that the reverse of this is true ; is there any proof, or any reason to believe that the lungs are the seat of the disease? or that the supposed deficiency of electric fluid in the atmospherical air causes the respiration to be thus affected? For my part I think that there is not ; for we know that Cholera makes its appearance in all seasons of the year, and under all circumstances ;* and that these circumstances which seem to be efficient in exciting an attack in one year, are not productive of the disease in the next.

The first one who has more accurately observed, and described this phenomenon is my friend and colleague, Mr. Twining, (*I speak of Indian writers*). He says "whoever undertakes an accurate pathological inquiry relative to the nature of cholera, and has an extensive opportunity to pursue his investiga-

* I allude to the atmospherical vicissitudes, which have been considered absolutely necessary to produce the deleterious agent, among which the principal one is asserted to be "the deficiency of the electric fluid in the atmosphere."

tions, will find many reasons for concluding, that among the most important lesions of functions which takes place in that disease, the decarbonizing power of the lungs is affected to a very great degree ; more especially in those cases which are attended with early collapse and coldness, and are void of any febrile and inflammatory symptoms. In connexion with this subject, we have occasion in post-mortem examination, sometimes to observe the contents of the cæcum and colon black, when the contents of the small intestines are of a light colour. These facts will induce us to inquire whether the black colour of the contents of the colon, and of the stools which appear during life in certain stages of cholera, be in all cases dependent of black cystic bile. Is there no reason to conclude, that the black secretions in the cæcum and colon, may depend on an effort of nature to compensate by a cutaneous secretion, for the inefficient action of the lungs and skin ? Many patients die of cholera before such secretion is established." This mode of reasoning speaks for itself; and Mr. Twining would have fallen into the same absurdity, had

he attributed the difficulty of breathing, or the decarbonizing power of the lungs, otherwise than an effect.

Can any one dare to assert that the disordered state of respiration in Cholera-Morbus, is caused by a deficiency of oxygen or carbonic acid gas? as it does in many other Asphyxia produced by a particular mephitical state of the air of a circumscribed place? Many and many have supported this extravagant notion, without having taken the pains of ascertaining, or closely examining, the state of the atmospherical air of the places from where the poison is supposed to have originated

"Nescit vox missa reverti."

And even those who have attempted the experiment, have they found in it (the atmosphere) the supposed disproportional quantities of its component elements? The results of their inquiries shows that they have not.

The imperfection of the respiratory process (*I speak a posteriori*) arises from the feebleness of the action of the heart, in the like manner as it happens in many affections to

which it is subject, viz. 1st, from its congenital malformation, and 2d, from other physical derangements of its own body, or of its dependencies. In the first case, we observe sometimes that the aorta arises from both ventricles, or by the obliteration of the foramen ovale. In the second, we find it hardened cartilaginated, ossificated, fattened, and in other pathological states.* In all the above cases the circulation is impaired primarily, and consequently the respiration difficult. In Cholera-Morbus I have observed that the diminished action of the heart precedes the difficult respiration; then this phenomenon does not depend on the deficiency of carbonic acid gas, even supposing that it has been found in a very small proportion. This mode of reasoning induces us to suppose that the seat of Cholera-Morbus resides in the heart; further investigations will show us whether this supposition can possibly be or not.

* See Dionis, Corvisat, Dupuytren, Senac, Bonet, Boerhaave, Weber, Kerkring, Morgagni who speak of all its organical lesions.

Chapter IV.

CARBONICAL DOCTRINE.

Is the blood of Cholera patients preternaturally dark, or preternaturally florid?—Does either of these phenomena depend on a superabundance, or on a deficiency, of *Carbon* in it?—Have chemical analysis detected in it a portion more than is found in its natural state?

The blood of patients in Cholera, say the advocates of its hypercarbonized state, "is always preternaturally dark coloured, from holding in mixture a superabundance of Carbon:" that the Cholera patients are "poisoned by the circulation of their own undecarbonised blood, through the substance of the brain," and that this particular state of the circulatory fluid is the "cause and the nature of the disease." It is well known that vulgar credulity ascribes the cause of this and many other diseases to an impure state of the blood. It is not strange that a person totally unacquainted with the laws of the human mechanism,

should think thus, but that an M. D. should, is a PRODIGY, or as Dryden said;

> "Great wits to madness sure are near allied,
> And their partitions to their bounds divide."

May I be permitted to say that neither of these propositions, nor their attempted explanations, are, or can be true. As a general rule, the blood of cholera patients under such circumstances as I have stated in *p.* 10 & 11, is more preternaturally florid than preternaturally dark. But it becomes darker as the respiration becomes difficult, and as the other symptoms of lowness and collapse announce its approaching state of death. May I be allowed to ask, if this phenomenon has any connexion with the amount of *Carbon?* Such a phenomenon is applicable on a very different ground, and on that its explanation is easy. The *blood* fluid which is sent to the heart by the veinous system for the very important process of arterialization, or for the purpose of supplying the lungs and other parts of the body, is accumulated in its right cavities, in the great vessels, and in all the viscera that receive the circulatory fluid

from them. (From hence the veinous congestion of which I shall speak in its proper place.) The blood being thus arrested, or imperfectly circulized, it naturally follows that its original dark colour, must, in some degrees, be preternaturalized, but not from a superabundance of CARBON. BICHAT has very judiciously observed, that the circulation of black blood, (veinous, or imperfectly arterialized blood) through the coronary arteries, is destructive to its sensibility. This phenomenon will also be considered in the explanation of the supposition proposed on the preceding pages. (*p.* 27.)

No Indian writer yet known, has made any distinction whatever, regarding the circumstances in which the blood of Cholera patients has been found preternaturally dark or preternaturally florid, excepting MR. TWINING. He has very accurately observed, that "when we can succeed in bleeding a man who is in the state of lowness and collapse," the blood has been generally found "thick, black and tarry," which being allowed to co-

agulate and to cool, it became somewhat more florid than when first drawn. But, "when Cholera is attended with febrile symptoms," he observed that the "surface of the crour was remarkably florid." From this authority and from what I have myself witnessed, I am allowed to draw the following conclusions.

1st. That this fluid is dark in deeply congestive Cholera patients, where reaction is suspended, and when the access of cold stage is manifested, but not from holding in its composition a superabundance of CARBON.

2d. That in Cholera patients attended with inflammatory symptoms, from prior derangements, where a certain degree of excitement is manifested, their blood is preternaturally florid, but not from a deficiency of CARBON. In fine, in every case where the circulatory system is torpid, or in any way wanting in action and respiration deficient, the blood is, and by the laws of animal economy must be, preternaturally dark. But it never is, nor can be so when the circulation and respiration are free. Were it admissi-

ble for me to dwell longer on the present subject, I would, on principles which no physiologist would controvert. But it suffices for me to say that CARBON has no more connexion with the phenomenon, than it has in giving fragrance to the rose, or lustre to the sun. That it should, by intelligent physicians, be supposed to have, is matter of surprise.

I have taken the liberty of borrowing a few productions of an eminent American physician who wrote on a no less interesting subject, to illustrate my assertions.

"Alterum alterius auxilio eget."

I beg now to close the present question with the following remarks, which are very applicable to my subject, taken from the same source.

"Have chemists detected, by a fair and satisfactory analysis, a superabundance of CARBON in dark veinous blood? Have they detected in it a particle more than is found in the florid blood of arteries? The annals of their profession cannot reply to these

questions in the affirmative. Or if they can I know not where the record is to be found. Again: does a mixture of carbon with bright arterial blood, convert it into dark veinous blood? No physician of reputation will contend that it does, I, on the contrary assert that it does not. I have witnessed the experiment, and know that I speak correctly. The hypothesis is but an abuse of animal chemistry, which should receive no countenance from real physiologists. Were I to say the same in general of chemistry, as applicable to the functions of living matter, I might set opposition at defiance. It neither performs any of them, nor aids in the performance. Within its proper sphere, that science is delightful and important, none can be more so. But it is concerned exclusively with dead matter. With life and all its attributes it is at war. It is the great antagonist of life, and life of it. It is no more suited to explain a single function of living matter, than the laws of life are to explain the functions of *Carbonate of Magnesia, or Glauber's salts.* When an attempt is made to expound by it a vital phenomenon, it is

dislocated and misapplied ; and that dislocation, like every other, proves a source of mischief. The harmony of nature consists in every thing producing after its kind. Abrogate this law, and chaos is recalled. Chemical causes, therefore, can produce only chemical effects, and vital causes vital effects. They are not transmutable in themselves or their action. Physiologists would escape an infinity of trouble, and the profession no less confusion, and error, were chemists to confine themselves to their proper laboratories, and to dead matter. The living body of man is as completely without their sphere as its structure and economy are beyond the imitation of the manufacturer of Chess-Playing Automatons, and Rope-Dancing Harlequins."

From all what I have stated relative to the opinions of the writers on Cholera-Morbus, we may draw the three following conclusions--

1st, That neither of these are correct,

Quacunque cernatur.

2nd, That their anatomical researches

and chemical experiments have not yet determined, in a positive and satisfactory manner, which is the *seat* of this disease; not which is its *nature*. Is this state of medical ignorance owing to the difficulty, or to the impossibility with which the solution of the problem is attended? or is it owing to the improper means which have been employed in the investigation?

3d. That the greatest error has been committed in having confounded the different forms of the disease; and consequently, in having established an invaluable therapeutical method for every one. As it is evident that Cholera-Morbus can be produced by different causes:* that it can be complicated with other diseases, and that its mode of action is different in different individuals,†

* Independent of the efficient one, there are others which may be classed under the head of exciting, and pre-disposing causes.

† This only relates to those who are found to be labouring under a preliminary affection for some time, and to those who are attacked immediately after having been intoxicated, or having taken an improper dose of medicine.

it is in a like manner unquestionable that each mode of suffering requires a different mode of arresting its progress. Under these considerations I shall endeavour to point out, in its proper place, the cases and stages in which such a distinction should be observed.

Chapter V.

CONGESTIONAL DOCTRINE.

How this phenomenon has been considered.—Is the sanguine system the first who receives the deleterious impression?—How is it affected during life, and how is it found after death?—Are there any other morbidness but congestion found in subjects dead of Cholera exclusively? Supposed seat of the disease.—Physiological investigation on the same subject.—Nature of the disease.—Conclusion.

"Ce champ ne se peut pas tellement moissoner,
Que les derniers venues n'y trouvent a glaner."
La Fontaine, Lib. iii. *fab.* i.

VEINOUS congestion is one of the most remarkable and uniform phenomenon of Cholera-Morbus. Every writer has found it to exist after death, in lesser or greater degree; but none, to the best of my knowledge, has attributed it to the seat or to the nature of the disease. For my part, I can say that out of every hundred individuals that have been opened by myself, I found at least ninety-nine with this morbid appearance. Does this very regular phenomenon show that the veinous system

is the first affected? I would not venture to answer the demand, though I have reasons to think in the affirmative. The following one will, perhaps, throw more light on the subject than any one yet given.

The *principium vitale* being from the very commencement of the attack, more or less impaired, it follows that the heart is deprived of that degree of excitement which is so necessary to the important function of circulation: hence the accumulation of the blood in its cavities and in the other important viscera of the human body. But is this to be considered as the *cause* of the disease? All I can say on the subject is, that personal experience has repeatedly shown me, that the phenomenon of the circulatory system precedes always, the derangements or lesions of the thoracical or abdominal organs, particularly when the patient has not previously suffered from other diseases, as I have stated ere this. Then the morbidness found after death in the organs of those individuals placed under similar circumstances, cannot be considered

but as effects of the primary cause, and rules of logic command that the latter should precede the former. But, again: if we look upon the cause of Cholera as a body residing without us, whose deleterious action we receive from the exterior: and that its first impression on the human body is carried directly into the sanguine circulation, we cannot with propriety call its morbid state the cause of the disease. Such a morbid state is no doubt a disease, but still this disease is not an idiopathy. Then the veinous congestion is but an effect. Then we see nothing, and we have nothing to combat but effects? The veinous system may be the seat of the disease, and yet its morbid state may retain a clasical or nosological denomination under the head of effects.

"Observar effectos y deducir causas esta es una ciencia."

The particular condition of the blood which constitutes congestion, has been considered to arise from three different causes, viz: 1. From the subtraction of its fluid part, and from the superabundance of carbon in it. 2. From the disordered state of the ganglion-

ary system, and 3. From the flogistical action of the stomach and intestinal canal.

With respect to the first point, I think I have said sufficient to prove that these assertions are not true; with regard to the second, I may add to what has been stated, that the disordered state of that system is the immediate effect of the unimpaired circulation, and of the other morbidness of the different viscera; in fine, what concerns the third, is not true, for we know that inflammation or ab-irritation of the mucous membrane of the stomach and intestinal tube, or that of any other part of the human body, cannot cause congestion. On the contrary, in all those affections, where there is a superior abundance of vitality, the blood flows freely, and the acuter or the intenser is their stage, the greater or the quicker is its circulatory action. Then the supposed causes of congestion, are merely effects. Then the destruction of life is effected by the united powers of all those effects. We may say, with Addison, that

"The united powers of hell were joined together for the destruction of mankind, which they effected in part."

It remains now to show which of these stated effects is the primary one, or which is the one that emanates from the deleterious agent itself, and from the knowledge of such an effect we will be able to deduce the seat of the disease.

If we closely observe a patient attacked with Cholera-Morbus in its early stage, we may be sure to remark that the action of the heart is the first sensible announcement of the disease, as the circulation is the last organical function performed even after death. The first phenomenon has escaped the observation of many practitioners,

"Ea sub oculis posita negligimus: proximorum incuriosi longingua sectamur."

and I do not know that any one has noticed it. The second one has been described by the principal part of them. I speak from practical and personal experience; having myself had two very distinct and well marked attacks, with an intermission of two years one from the other, in different countries (*Manilla and Calcutta.*) I recollect having felt as when we sigh profoundly, with a quick and an interrupted palpitation of the heart which last-

ed for a short time, and similar to that produced by a fright or a sudden moral impression. To which followed diminution of respiration and of animal heat—defective perspiration—nausea, vomiting and purging. The patients in which I had the opportunity of performing some experiments, unanimously asserted that they felt the same symptoms. My investigations, since my last attack, were principally directed to explore the circulatory system in every stage of the disease, but particularly in its commencement, both by percussion and auscultation. In these experiments I found that the impulse of the heart's action was, at the commencement, increased—that its alternate contractions were dissimilar and much more audible than in its natural state; and that successively it began to diminish, and to assume a more prolonged contraction (*here the respiration begins to fall*) more dull and not corresponding with the strokes of the pulse, which gradually decreased until it was no longer to be felt. That in the highest state of coldness, and collapse, it was generally motionless: that no sound or feeling indicative of its action was to be perceived;

and that in every instance where the above symptoms existed, it roused again, even a long time after death. I can assure that it is not uncommon to see the torrent of circulation in motion for some time after all the other functions have ceased. That this phenomenon reproduces the heat in the dead body no one would doubt, and that this animal heat is the agent of those muscular contractions observed in the corpse for some time after the total extinction of life, every physiologist will acknowledge. Then the depressed state of the heart is the primary effect of the deleterious agent itself, and consequently the disordered state of the circulatory system, or the veinous congestion, is the secondary : the abirritation of the mucous membrane of the stomach and intestinal canal, is the terciary ; and the morbid state of the ganglionary system is the last. Then the seat of the disease is the heart. Can its affection be compared with those mentioned in page 27 ? though its producing cause is different. The circulation of the blood is the principal and the first condition of animal and organical life ;

if it is disturbed by any cause whatsoever, the consequences are easy to explain. In Cholera it produces a complete cessation of every function of the organical life* and an arrest of vital energy. Under these very particular circumstances, is it not very reasonable to suppose that the principal seat of the disease is *there* where the effects of the deleterious agent are first felt during life? and *there* where the most constant morbidness are found after death? Every Cholera writer has invariably observed that the heart, especially its right cavities, is generally gorged with black semicoagulated blood; that its proper veins are also exceedingly distended with the same kind of blood; that the nearer the vessels are to it, the greater is the quantity of such black blood which they contain, and that it is especially considerable in the superior vena cava, and in the ramifications of the vena porta. That in the arteries the blood

* Excepting the lacteous secretion of nurses, which I have repeatedly seen in the most perfect state until the moment of death, and even to continue the same for some time after.

is also dark, viscid and imperfectly coagulated. In fine, if we look to the different parts of the body where the blood is most required, and where it circulates the most in the state of health, we shall find them more or less injected with blackish blood, and in a state of morbid vascularity. The said parts are the liver, the spleen, the pancreas, the mesenteric ganglions, the kidneys, the intestines, the omentum, and the capillary vessels.

The piamater and the posterior portion (*sometimes all*) of the cerebral hemispheres, upon their convex surface and upon the cerebelum, presents most always several patches of true ecchymosis and well marked saguineous infiltration ; and the nervous system contains a blackish, viscid, semicoagulated blood, somewhat resembling blackberry jelly. Even the lungs and the bronchial mucous membranes are generally of a deep livid red blood ; the former generally exhibit a degree of vetnous congestion, which at the depending parts, is much increased by gravitation : the subclavious, the internal jugular, and the vena azygos are found loaded with

blackish blood and somewhat contracted.* Now if all these phenomena have been so regularly and so closely observed by the generality of writers, what reason have we not to consider the stated supposition as a reality ?

Another no less remarkable phenomenon has called my attention in the examination of subjects dead of this disease, that neither had been previously affected by any other, nor had they taken any medicine whatever during their sufferance. This is the absence of a morbid appearance in either thoracical or abdominal viscera, excepting a degree of veinous congestion, which was relative to the temperament of the individual. The alimentary canal of these subjects was always found of a pale white colour and somewhat pulpy ; its lining easily detached from the subjacent coat. This is another unequivocal evidence in favour of my supposition, and against that

* Madras Reports—Calcutta Med. and Phy. Trans. —Lancet—Edinb. Med. and Surgical Journal—American Journal of Med. Science—Twining—Christie—Keir —Kennedy—Bell—Orton—Roch—Cyclopædia of Prac. Med. Lond. 1832.—Chol. Gazette—and many others.

which attributes the disease to an essential and primary gastro-enteritis; and leads me to believe that the greater part (if not all) of the stomach and intestinal morbidness found in those individuals not at all affected prior to the Cholera attack, are owing to the *male-practice* rather than to the nature or result of the disease.

To comfirm the stated supposition we must first know how the producing cause, or the deleterious agent, is introduced into the human body, whether it enters by the absorbents to the capillary vessels, and from hence to the torrent of the veinous circulation; or whether it finds its way through the respiratory organs. I should say that its morbid impression is principally performed through the lungs, though the skin may contribute to the same operation, but not so powerfully. In such a case the nerves of the respiratory organs receive the deleterious agent and they carry it to the heart. By this physiological action, those nerves receive a passing ab-irritation which disappears as soon as the heart is

seized. The heart's action is consequently increased ; its contractions are dissimilar and impetuous, whilst the strokes felt on it are dull and not corresponding with those of the pulse. This revolutionary action continues for a short time, and it gradually decreases and concentrates itself in its great cavities, where it remains until reaction is produced, either by the efforts of the most active therapeutical agents, or by those occurring after death. From this spasmodical action of the heart (*if it can with propriety be called so*) must necessarily follow the concentration of the circulatory fluid, and from hence the morbid secretion of the gastric-mucous-membrane, and that of other tissues which have great sympathetical relation with the respiratory and circulatory functions. This morbidness is a sympathetical effect, and its appreciable condition depends exclusively on the state of health in which the patient was placed prior to the invasion, and on the powers of the drugs employed during the sufferings.

If such a poison be introduced by the skin, the same phenomena will occur, for every physiologist knows the intimate relation which this organ has with all the tissues under it, though we do not observe in this part of the body any other phenomena than the absence of caloric, and the suppression of exhalation.

Should the above theory be correct, I can with propriety assert that

"Non cernimus ea, quæ videmus."

Easy and simple as it appears we must, nevertheless, confess that the human economy is very complicated, and that we are unacquainted with many of its laws and sympathetical relations. We deduce from the above that the *nature* of the disease in question is Spasmodic and that the affected organs and functions suffer from a deficiency of excitement and vital energy.

Chapter VI.

Which is the cause that produces Cholera-Morbus ?—Where is it to be found?—Which is its nature or composition ?

"Felix qui potuit rerum cognoscere causas."

The cause of Cholera-Morbus is to be searched for nowhere else but without the human body. Let this *arcanum* be what it may, the fact is that it resides without us; and that we do not know it but by its deleterious effects.

"Causa latent, vis est notissima."

Were I to enter into a controversy regarding it, I would, undoubtedly fall into the great *abyss* of medical difficulties. All what can be said on this intricate subject, is that we are ignorant of its nature, or composition, and of the species of matter to which it belongs. Here the subject for the present may be allowed to rest. "*Ne quid nimis.*"

With regard to its origin, the following, is the best account that can be given.

"Proinde ubi se cœlum, quod nobis forte venunt,
Conmovet, atque aer inimicus serpere cœpit;
Ut nebula ac nubes paullatim repit, et omne,
Qua graditur, conturbat, et immutare coactact.
Fit quoque, ut innostrum quom venit demique cœlum,
Corumpat, reddatque sui simili, atque alienum."

Lucretius, de Nat. rerum, lib. vi.

Which has been rendered by the learned J. M. Good, Esq. as follows:

"But when the heaven, of poisonous power to us
First moves remote, its hostile effluence creeps
Slow, like a mist or vapour; all around
Transforming as it passes, till at length,
Reach'd our own region, it the fatal scene
Taints, and assimilates, and loads with death."

And what relates to its properties, whether contagious or infectious, see Chapter III, of the second section.

SECOND SECTION.

THERAPEUTICAL OBSERVATIONS.

Chapter I.

The different methods of treating Cholera-Morbus, employed hitherto are founded on empiricism.—The favourable results obtained from them cannot be attributed to their specific properties.—Insufflation of air, or oxygen gas into the lungs.—External frictions.—Application of heat.

With regard to the last point set down in the general observations which relates to the treatment of Cholera-Morbus, I cannot but maintain that the different and numerous methods established hitherto are the reverse of being curatives. And how could it be otherwise when they have been led both by ontology and empiricism.

The first intention to be attended to in establishing a treatment for any particular disease is well known, viz: *to restore the vital, or the organical powers of a preternatural function to its natural state.* For this purpose it is supposed that a thorough knowledge of the pathological state of such function should precede the therapeutical indication. But has such an intention proved as successful to the practice, as it has been expected? Many have said yes, but experience has shown the contrary. In the impossibility of knowing how to act, many methods have been proposed and many drugs were efficaciously recommended; and these methods and drugs have endured as many changes as the success in their practice was more or less frustrated. I have observed myself, that medicines that have been in vogue at the end of an epidemy, were set down as specifics for the following season. But the season makes its appearance with that destructive enemy of the human kind, and those very medicines which were once considered so powerful against it

are then of no use. The reason of this though obvious, has been overlooked. If we reflect on it we shall find that in almost every epidemical disease the last cases are much milder than in the beginning, and it is a matter of course, that in such circumstances the recoveries should be greater in proportion. The same is and has been the case with regard to Cholera. Hence it is evident that the number of fatal cases being less, the recoveries were attributed to the properties of drugs instead of being ascribed to the mild character of the disease.

I also have observed another, and perhaps no less interesting circumstance, relative to the subject of attributing particular properties to drugs which have been considered as specifics in one season, and of no use in another, and which deserves a passing notice, viz: That the votaries of the anti-flogistical method having met with a great number of cases of a mild character, and tending to a certain degree of flegmasy of the intestinal tube, produced either by a particular circumstance of the disease, or by other causes

existing prior to the invasion, have, consequently succeeded in saving a greater number of individuals: and thus have been encouraged in supporting their arguments in favour of their method. But, is the theory of these advocates applicable to every case of Cholera, and to every one of its stages, exclusively? Certainly not. The same is the case with the partisans of stimulants. They have succeeded with their curative plan, in cases where general collapse, coldness, and other symptoms of adinamia were well marked, and the success obtained in such cases being greater than that experienced in others, it was considered quite sufficient to establish it generally, and exclusively. Hence it is evidently known that the above mentioned sectaries having failed in some instances, and succeeded in others, without having taken the pains of discriminating in which case, or in which stage of the disease, the stimulants are indicated, or contra-indicated; they erroneously and empirically attributed to themselves what belongs to an adventitious hazard.

From the above, we may conclude, 1st. That the failure of the great number of valuable medicines employed hitherto in the treatment of Cholera, can only be attributed to the unsettled state of medical opinion relative to the pathology of the disease, and to the improper use of them, rather than to the deficiency of their remedial powers—and 2d, That the success occasionally obtained from any of them can be imputed but to a mere chance.

Independent of the above mentioned methods, there are three other mechanical means, to serve as auxiliaries in the treatment of Cholera, and which have been recommended with pretty much the same degree of enthusiasm and empiricism. These means have been put in practice in three particular cases, or stages, peculiar to Cholera, viz: in short or difficult respiration; in difficult veinous circulation, and in deficiency of animal heat; and they are as follows:

1st. To restore breath many have proposed, and even made use of, the artificial in-

flation of the lungs with a common pair of bellows, with the object of introducing oxygen gas into the organs of respiration, and thus producing an excitement throughout the veinous system; but this practice cannot afford much assistance. Nor would its physiological action satisfy us of its efficacy: 1st. Because the air which is introduced into the lungs, either by the mouth or by the nostrils, will escape, even without being withdrawn by suction: 2d. Because a forcible exhaustion of those organs is liable to occasion pulmonic hemorrhage, and 3d. Because no pathological advantage can accrue from such a practice, even admitting the possibility of the air's non-escape from the lungs.

Ægrescit medendo.

2d. The same means, and also frictions have been employed to restore the circulatory motion, thinking, no doubt, that by introducing air into the lungs, they could oxygenate the blood, and could thus produce re-action of the heart. But is it not a physiological error to ascribe the action of

the heart to the excitement or to the motion of the lungs? Every physiologist ought to know that there are many cases wherein the function of respiration ceases while the heart continues to circulate. I have satisfactorily proved that we find this phenomenon in almost every case of Cholera. As to the frictions I do not think that they could answer any useful purpose when the action of the heart has ceased, or that they could be necessary when it still continues.

3d. With respect to the reproduction of animal heat, steam baths, and many other local, and external applications, have been more or less successfully employed. But it is my opinion, and perhaps that of others, that there is no medium through which we can more advantageously re-produce it, than by that of applying the agent to the interior of the body through the mouth or through the anus.

The best agent for the above purposes are those of a stimulant property, which being elevated to a certain degree of temperature will

undoubtedly regenerate the animal heat much sooner than any other. The one to which I would give the preference is to Wine, Brandy, or to any volatile alkali; and the place to which it can be applied with more confidence and success, is undoubtedly, the intestinal tube, through the anus.

Chapter II.

OBSERVATIONS ON TOBACCO SMOKE ENEMA.

Physiological action of Tobacco in the human body—Which is the best form that Tobacco can be administered?—Which is its principal element?—Which are its relative merits?—Final Conclusions.

"All true remedy must begin at the heart; otherwise it will be but a mountebank cure, a false imagined conquest. The weight and wheels are *there*, and the clock strikes according to their motion."

THE use of Tobacco Smoke Enema, which I have brought to the Medical and Physical Society's notice in my paper of the 1st of Aug. ultimo,* though perhaps of no less an empirical nature than any other Cholera medicine hitherto recommended, yet it gives greater satisfaction to the inquirer who un-

* See Appendix No. 2:—in that paper I state the results of my first trials in three different cases.

dertakes to be acquainted with its action ; and it also proves to be in the practice, a successful and a safe pathological agent, if properly administered. In the above mentioned paper I stated that being a new medicine for that disease, a greater number of trials were absolutely necessary to confirm its efficacy ; and that as the medical opinion was not settled with respect to the mode of action of the Tobacco plant's different preparations, it was a matter of importance to engage our attention in a future investigation on the subject, in order to enable us to prescribe *that* which may prove to be the best. I also promised to make some experiments on that subject, and to communicate them to the Society as soon as I could do so. Now, in compliance with my engagement, I have much pleasure in submitting the summary of my experiments, which will serve to illustrate the three following points, which in the present question are of a greater importance : viz.

1. To ascertain the physiological action of the Tobacco plant on the human body.

2. To ascertain the form in which it can be more beneficially given, and

3. To determine the relative merits of either.

With regard to the first, I am obliged to decline the opinion which I have entertained hitherto, viz. that different preparations of Tobacco may produce different effects on the constitution. Mr. Brodie's statements led me to that error—but having myself performed the experiments on animals of different kinds, and having observed the effects on the human constitution and experienced them in my own, I am able to sustain the contrary, viz. *that the Tobacco plant and all its preparations act immediately on the sanguine system, with more or less activity, according to the degree of their strength, and to the quantity administered;* that when either of such preparations is introduced into the heart of a living animal through the auricula, it produces very nearly the same effects, viz. vertigo, nausea, tremor, cold sweats, syncope and general insensibili-

ty ; and if the dose is overcharged it produces death. Forty cubic inches of Virginia Tobacco Smoke is enough to produce the former effects in a dog of an ordinary size, and twice as much more, repeated several times, will cause death.

The same is observed when the smoke is injected into the brain, and it acts also in the same manner when introduced into the system, either by the mouth or by the anus ; with a greater or lesser degree of local inflammation and upon examination of the dead bodies of animals killed with the smoke, we find the nervous system, as well as every other organ, unimpaired. Repeated experiments of this kind have shown me that the nervous symptoms manifested during the administration of the medicine on the living subject, are not caused by its *immediate application or contact with the nerves of the heart,* as it might be supposed, but that they are a secondary effect, or a sympathetical phenomenon of its physiological action on the heart. This physiological action is performed in the following manner. The active element of the Tobacco

plant is first introduced through the absorbents of the mucous membrane and carried into the circulation, where it acts principally; from hence it is transferred to the brain through the aorta, but if we tie this vessel in order to intercept the communication with the brain, and we inject the heart through the auricula, the transference does not take place; and the nerves which have been in contact with the medicine are found in their natural state.

With respect to the form in which Tobacco may be administered, I cannot but affirm that that of smoke is preferable, in every respect, to any other. I have tried the extract in a dose of from 1 to 3 grains, without much success, and knowing that a greater quantity would produce alarming effects I declined the administration. The aqueous infusion of the leaves administered by enema, in various proportions, has been very successful, not only in my hands but in those of the gentlemen to whom I have alluded in my first communication on this subject;* but

* See appendix, No. 2.

still there are some inconvinients which I will state in the solution of the next point.

My reasons for preferring the Smoke to any other form, are founded on practical and on theoretical observations, viz. 1st. That it does not produce any disorganization of the organical structure to which it is applied—and 2d, That the Tobacco leaf, by undergoing the process of ignition, loses the greater quantity of animal matter, lime, acetic acid, nitrate and muriate of potas, and muriate of ammonia, which it contains, leaving a particular principle of a volatile nature, which is very different from that of any other vegetable yet known. This principle gives the proper character of Tobacco to the plant and is soluble in water and in alcohol, but the small portion which is solved by infusion being mixed with the other substances of which Tobacco is naturally composed, it follows that it must be much less active than in its insulated state. The numerous experiments which I have performed, give me sufficient confidence in assuring this to be a fact.

Thus Tobacco smoke being charged with a greater quantity of such principle, which in my opinion is the most active element of the Tobacco plant, and perhaps the constituent part of the essential oil, its efficacy and *modus operandi* must undoubtedly correspond with its physical and chemical qualities.

A few days after having performed some experiments connected with the above related statement, I met with a German journal, in which I flatter myself to say that I found my opinion confirmed by the accurate statement of a learned foreign chemist, *Mr. Hermbsteadt,* who undertook to make a perfect analysis of the Tobacco leaves, and to isolate that principle which is the active constituent of that plant. Mr. H. succeeded in his undertaking and named it *Nicotianine.* On further investigation I found that Mr. *Duncan* speaks of him in his Edinburg Dispensatory, and quotes Mr. H's experiments as follows " He infused six pounds of dried Tobacco, cut small, in six times its weight of water, and drew off one third. The distilled

water was turbid, neither acid nor alkaline; tincture of nut-galls produced white flocculi, soluble in acids and alkali. By exposure in a closely covered vessel, the water became clear; and on the surface a white, foliated crystalline substance collected. This was called *nicotianine*. It is easily fusible; equally soluble in alcohol and in water; is volatile, and diffuses a smell like that of the finest tobacco. Its action upon the animal economy is powerful. When tasted, it produces a peculiar stimulus in the mouth and fauces, like that of Tobacco, and very little applied to the nostrils causes sneezing. A grain swallowed caused vertigo, nausea and retching. It is the *nicotianine* which is agreeable in the smoking of tobacco, but its flavour is deteriorated by the empyreumatic oil mixed with it." In order to render my opinion still much more satisfactory, I shall make another quotation from another no less eminent work, which is as follows, "In the process of smoking Tobacco, the oil is separated, and rendered empyreumatic by heat, it is thus applied to the fauces *in its most ac-*

tive form." (Paris and Fonblanque's Medical Jurisprudence, page 419 vol. II.)

With regard to the third and last point, I think I have already stated the general results of the physiological action of the Tobacco Smoke, from which we ought to come to a conclusion in determining the relative merits of either smoke or infusion, as a therapeutical agent for the treatment of Cholera-Morbus. In the above mentioned general results it is proved that practical as well as theoretical observations are decided for the smoke form, and experience has subsequently confirmed the resolution.

The following comparative conclusions on the effects produced by smoke, and by infusion, will add to my assertion, and will contribute to solve the problem at once.

1st. That the action of the infusion is not so quick nor so energetic as that of smoke.

2. That it is apt to be rejected before it can have impressed its action on the system.

3d. That it produces local inflammation

when retained a long time into the intestinal tube, and

4th. That a return of vomiting soon after the injection is most generally observed, whilst the smoke does not produce any such phenomena, and it acts almost instantaneously in rousing the latent energies of life, and with much more activity in setting the circulatory, the exhalant, and the absorbent systems into motion; which, in my opinion, are principally and generally affected, if not primarily.*

"Tobacco, in my joy thou didst not flatter:
Tobacco, from my woes thou didst not flee;
And Fortune to the winds her gifts may scatter,
I shall not miss them—so she leave me thee."

"Let Dantzick boast her matchles eau-de-vie;
Let gin, Schedam, immortalize thy name;
Rum and rum-shrub support Jamaica's fame;
Grog—toddy—punch—whatever the mixture be;
Or naked dram,—shall not be sung by me.
I sing the praises of that glorious weed,
Dear to mankind, whate'er his race or creed,
Condition, colour, dwelling, or degree;
From Zembla's snows to parched Arabia's sands."
"Loved by all lips, and common to all hands!

* For the above assertions, compare the clinical observations of the Appendix, No. 3, with those of No. 4.

Hail, sole cosmopolite, TOBACCO, hail:
Shag, long-cut, short-cut, pig-tail, quid, or roll,
Dark Negrohead, or Orinooko pale,
In every form congenial to the soul."
Monthly Magazine.

From all the above stated principles we are directed to come to the following final conclusions, viz: That the Tobacco Smoke Enema is the most active, and the most successful, therapeutical agent in the treatment of Cholera-Morbus of any one hitherto known: That the less complicated this disease is with any other, the greater and the more effectual are its remedial powers. But we must abstain from its administration in those stages accompanied by an ab-irritation, or a superabundance of excitement, produced by other preliminary causes, or by a particular individual idiosincrasis.

I said, in the first section, page 36, that each mode of suffering requires a different mode of arresting its progress; and that I would endeavour to point out the stages in which such distinction ought to be made. In accordance with my promise, I beg to state, that whenever there are symptoms of real and

existing flegmasy of any internal organ, the Tobacco Smoke Enema in the first or second stage of Cholera is contraindicated, and it will do more harm than good. Cholera-Morbus, presents itself sometimes under two very distinct forms. Each of them is dependent on the state, and on the temperament of the individual, but it assumes only one, some time after the invasion. In a stout and muscular person of a sanguine constitution, born in northern latitudes, and accustumed to live high, but not in dissipation and not previously affected by any disease, the attack sometimes comes on, at the commencement, with unequivocal symptoms of an inflammatory state of the principal organs, which induces the physician to employ an antiflogistic treatment; but it suddenly sinks in a depressed state of vital energy, with coldness, veinous, congestion and tendency to sudden death. In the generality of these cases, the Tobacco Smoke Enema, is by no means injurious at the commencement of the attack, but its use is indispensable as soon as the symptoms of collapse begin. Other times it attacks the same sort of individuals without those apparent inflam-

matory symptoms, and the disease is declared at once in a different form, viz. cold extremities, eyes sunk, difficult respiration, no pulse, no cutaneous exhalation, torpor and collapse: in this case, the above enemas are absolutely necessary. But when the disease has invaded a person of any constitution, or habits, who has been previously affected by other disorder, in a febrile, or inflammatory form, an antiflogistic treatment ought to be followed as long as the inflammatory stage prevails, but it must be changed immediately on the appearance of the spasmodic symptoms. The change consists in the administration of the Tobacco Smoke Enema. Thus we find medicines do good, when properly and judiciously administered.

Chapter III.

IS CHOLERA-MORBUS CONTAGIOUS?

Preliminary observations.—Definition of the words CONTAGION, *and* INFECTION.– How contagious, and infectious bodies are communicated or received into the system, and what diseases they can produce.—Dr. Twining's observations on the same subject.

THIS is the extensive FIELD where many able writers have sowed their erudition ; and unfortunately we reap in *it* nothing but speculations.

A close inquiry into the different opinions on the present question, will not give us a satisfactory answer to the demand, for the greater part of them are contradictory ; others are incoherent, and many are entirely false. Some wishing to maintain that *it*

is contagious, have proved that *it is not.* And how? By an abuse of terms, and by an improper definition of the words *contagion* and *infection;* whilst others intending to assert the negative, have exhibited that the positive is the case, by the same misapplication of the above mentioned words. But if we take a fair examination of the real meaning of each term, and apply them in their proper places, we shall be able to answer the above question satisfactorily.

On se sert ordinairement de plusieurs noms, pour ex primer la même chose: cependent si l'on examine tous ces noms les uns apres les autres, on trouvera qu'ils ont chacun leur signification particuliere.

Quintilianus Justit. A. Orat. vi. 3.

The excellence of a word is its definition, and definition is the rule for the scholar in the use of words.

The term *contagion, contagium*, or *contagio*, is composed of the preposition *con*, which is used by latinists conjointly with other words, instead of the adverb *simul;* and of the verb *tangere.* In a philosophical sense it means the contact, union, or cohe-

rence of several bodies which are reciprocally touching each other. But medically speaking it comprehends the physiological action of a poisonous matter introduced into the human body either *per intimum contactum,* or *per solucionem continui.* In a philosophical sense, this word is considered as a substantive and has no other grammatical variation; but in medicine it is subject to the conjugation and forms of a verb.

The word *Infection* takes its derivation from the Latin verb *Inficere,* to infect: it is philosophically applied to those sensations which are produced in the olfatory organs, by a disagreeable smell. But in Medicine we ought to consider it in the same view as the word contagion; i. e., the physiological action of a poisonous matter introduced into the human body, with the exception that it is communicated or introduced into it only *per contactum mediatum* or *in distans.*

Under these considerations, it is evident that contagion cannot be produced without the concurrence of a visible and palpable

specific virus ; and that such a *virus* cannot with propriety be called contagious unless it has the faculty of producing a disease of its own kind, when applied to the body either *per intimum contactactum or per solucionem continui,* as we see it with the *virus* producing

1st. Syphilis, small pox, and many other affections of the skin ; and

2d. Hydrophobia.

In the first case we only require to be in an immediate contact with the virus : in the second one, the virus must be introduced through the skin. Whilst infectious poison being an invisible and impalpable particle or corpuscle scattered in the air, of an unknown nature, and not within reach; produced (as far as we are able to judge) by the emanations or vapours of stagnant swamps, or corrupted waters, where animal and vegetable substances have been decomposed by the action of the atmosphere, and also by the vicissitudes of the celestial bodies, is inhaled through the respiratory organs, and does not produce the

same affection in every person so exlcusively and infallibly as the contagious poison. Nor can the persons suffering from its effects, let them be what they may, communicate them to any one by either of the contacts above stated.

Contagious poison is invariable in its propagation or transmission, and it does not degenerate into another foreign disease, viz. Hydrophobic *virus,* can produce but Hydrophobia:—syphilitic *virus* can produce but syphilis, and vaccine *virus* can produce but small pox, &c. &c. Whereas infectious poison can produce many different diseases, in different persons, in the same season of the year, viz: Dysentery in some; opthalmia in others; catarrh and fevers of various descriptions in many.

It remains now to determine whether Cholera-Morbus *is* or *is not* produced by a *virus sui generis,* or whether the disease can create *one.* My opinion is in the negative. My long residence in India and other parts of Asia, where the disease is endemic, has afforded me great number of opportunities for personal

inquiry on the subject, and therefore I think that Cholera-Morbus *is not* contagious.

Were I to state the number of practical cases which I have put to the test, in order to ascertain the real truth of this question, I would perhaps give greater weight to the solidity of my opinion, and it would also persuade those who are of a different mode of thinking. But let it suffice to state, that neither the intercourse of a great number of sick in hospitals and in my private practice; nor the experiments tried on my body on different occasions, have been sufficient to acquire the disease. I have many marks in different parts of my body of incisions made on it, in order to introduce in my circulation the different kinds of matters voided by patients during the different stages of the disease; and these experiments have not had the power of communicating it.*

I am supported in my opinion by many In-

* In page 41, I speak of having been invaded myself on two different occasions; but it must be understood that the disease was not taken by either of the contacts already stated, for I had no communication at the time with any patient suffering from Cholera.

dian writers, who have had as much, (if not more,) experience than myself on the subject, and it is with the greatest pleasure I avail myself of this opportunity for quoting Mr. Twining's observations on the same question. They are so interesting, that I cannot deny myself the gratification of giving them to the public, and more particularly, knowing that the work that contains them is scarce in this country, where the contagionists are, (or have been in the time of the epidemy,) greater in proportion than in Europe.

"It is an object of much importance to ascertain, if possible, whether Cholera be a Contagious Disease, and liable to be communicated generally to those in health, by means of a virus generated about the persons of the sick ; and conveyed either indirectly, by means of clothes or goods ; or received directly, by personal contact or near approach to patients : whereby the disease is produced, independent of other exciting causes. If it should appear, that Cholera is *generally* propagated by means of some noxious emanations from the persons of the sick; the strictest

quarantine regulations would of course be adviseable. On the contrary, should we observe that the disease is neither generally, nor even frequently, found to affect those who are most exposed to personal communication with the sick; under such circumstances, that if contagion existed, we might reasonably expect it would be present in its most concentrated and active forms: we would then doubtless abandon all idea of retarding the progress of Cholera, by interdicting direct intercourse with the sick, or with those who may be exposed to any emanations from the bodies of persons suffering under that disease.

"I will now proceed to state such facts as appear conclusive with respect to the Cholera of India; showing the results of unrestricted communication with the sick: and if the disease be neither generally, nor frequently, received, after the most extreme exposure; few persons will deem the danger great, from slight and transient intercourse with the sick. If the disease ever possess contagious properties, assuredly there could be no difficulty in pointing out the particular

instances of contagion, at the time that they occur."

"The persons most exposed to contract Cholera in the General Hospital at Calcutta, (if the disease were contagious,) are those having charge of the bedding and clothing, and those employed in personal attendance on the patients. The man who has charge of the Hospital clothing, and his assistant, both attend in the wards every morning, changing the bedding of one ward each day; on ordinary occasions. But when Cholera exists, these people are obliged in the majority of cases, to change some of the bedding of the patients having that disease daily, or oftener when soiled; for which purpose they come to the bedside, taking away with them the dirty bedding, which is given to the head-washerman. The clothes-keeper, SHIAK SELIM, at present employed at this Hospital, has been on that duty for two and a half years; his predecessor Dhowall filled the same office for 23 years, and died at his own house, of old age and debility; having been pensioned for long service. The head washerman GAWHEE, at present employed here,

has been on this duty about one year and a half: his predecessor HASSYE, held that office for two years, and died of chronic disease of the bladder, after an illness of near four months. Before this man, BEECHUCK was washerman for 21 years; he died of chronic induration of the liver, and pulmonary disease. Not one of the subordinate washermen or people employed about the clothing and bedding stores has ever had Cholera."

"The native dressers have daily the most unreserved communication with the sick, changing the applications over leech-bites, and the bandages to the arms of such as are bled; dressing blisters, and applying sinapisms: not one of these men has ever suffered from the disease. BUCTOURIE, the head native dresser, who instructs the subordinates, and attends with them alternately, while at their duty, has been constantly employed at the Hospital for 26 years. He is a clever man, of good character, and asserts that he has never known one of the Hospital servants to be attacked with the disease."

"The sweepers who clean and change the close-stools, as well as the pans in which the matter vomited is received; and who wash those patients who are helpless; have never been known to suffer from Cholera. It may be supposed, that the occupations of the sweepers, are usually such as might be expected to blunt their susceptibility to disease, or to the effects of any ordinary exposure; but this will not be urged respecting the Hindoo coolies;* who are employed in ordinary attendance on the sick, and are obliged to be much in contact with all bad cases of Cholera, to keep the blankets from being thrown off, and the men from falling out of bed, when in the worst stages of disease, and suffering much from jactitation and restlessness. These coolies are also employed to rub and champoo the extremities of the Cholera patients; and often cannot avoid inhaling the breath, as well as the exhalations from the bodies of patients, in the most deplorable stages of the disease. Not one of these men has ever suffered an attack of Cholera. The young students who are under a course of medical instruction, at the H. C. School for Native Doctors: are

* Coolies is the Indian name for Porters.

usually in attendance, and assisting at the Hospital when Cholera is prevailing in a severe form, and when great numbers of patients are admitted with that disease. In March and April, 1827, when the Hospital was unusually crowded with Cholera cases ; and all the attendants much distressed and exhausted by the severe duty : a number of young students from the school, were brought to the Hospital, and placed in attendance over the worst cases ; being relieved regularly day and night. These young Asiatics, performed their duties with great diligence, assiduity and humanity, for many days and nights; and none of them suffered by this constant exposure to whatever may be contagious in the emanations from Cholera patients ; as well as frequent contact of their persons. I publish these statements, after having made the most careful observavations on this subject, when the disease has been prevailing, during my residence at the Hospital : and after the most diligent inquiry relative to the same points during the last 14 years. A remarkable instance of exposure, with impunity, to any morbific causes arising

from the person, during Cholera, is recorded at page 497 of this work."*

"By Mr. Henderson's account of the disease which appeared on board the H. C. ship *Berwickshire*, in Bombay Harbour, in June, 1830; it appears that 94 men were taken ill of Cholera within a few days: of whom 38 died. A large proportion of the sick was landed, and treated at the Bombay European Hospital, and 16 of the deaths occurred in that Hospital; where there were at the time more than 100 patients and attendants, not one of whom contracted the disease."

"The History of Cholera in India, presents us with a vast number of instances, where, either a body of healthy troops, has

* Dr. T. alludes to a woman who was nursing a child six months old, when she was seized with Cholera: she would not be separated from her infant who remained in the bed in close contact with its mother when she was suffering severely from the worst symptoms of collapse. If Cholera were liable to be contracted by personal communication, this child was exposed to its influence in the highest degree, but showed no sign of ailment.

joined and encamped along with those among whom the Cholera was existing in the most violent and fatal form; or where a detachment in which the disease was raging, has joined a healthy encampment: and the disease has not been in either case, communicated to those in a healthy state. A body of Holkar's Reformed Cavalry, 500 strong, were posted at Mahidpore, adjoining to the camp of above 2000 Bengal troops and followers, among whom the Epidemic was prevailing; and the Cavalry did not suffer from the disease, although a Cholera patient from the Bengal division was brought to their camp, and went through every stage of the disease among them. In like manner, Casement's Regiment of Irregular Horse, joined the Hansi division of the Army, and remained with that division without contracting the disease; at the time when the Epidemic Cholera was at its height. On the 11th May, 1818, a company of Bengal troops, ninety in number, encamped in an unhealthy spot on the bank of a small lake, sheltered by a few trees, and surrounded by low

woody hills. The detachment arrived at this place all in perfect health; Cholera commenced at midnight, and before sunrise next morning, twenty men were ill of that disease; they were removed to the Saugor camp, in carts and doolies, in the course of the day; but before arrival there, five men died, and two were moribund. By the end of the week, every man of this detachment had gone to Hospital with Cholera; or with a purging of some sort, resembling modifications of that disease: so that there could be no doubt of the malignity of the malady from which they were suffering. The men of this detachment, had unrestricted intercourse with the troops in camp; not one individual of whom was attacked with Cholera. For these facts, I refer to the Bengal Report on Cholera, p. 133, 134 and 137. More than a hundred such instances may easily be collected by any one who will take the trouble to make critical inquiries respecting the History of Cholera for the last fifteen years. The facts above cited are sufficient to prove that the Cholera, in India,

when existing in its most aggravated form, is not a contagious disease: and that there is no virus generated in or about the sick, by means of which the disease may be communicated to persons in health. The facts which prevent our acknowledging that the Cholera of Bengal is contagious; are numerous, well authenticated, and the details are precise,"

"It appears, that a body of troops joining a camp at an unhealthy station, after long marches, is very liable to suffer from Cholera; but if a camp in which Cholera exists, should move to a healthy station, and still numbers of their men continue to fall ill of the disease, in consequence of their past exposure; troops joining them after their removal to the healthy camp, do not suffer from Cholera. It has often happened, that this disease has raged among troops encamped on the low banks of a river; without any evidence of Cholera having travelled to them, or having been propagated from them to others at a short distance, who communicated freely with those suffering from the disease. Epi-

demic invasions of Cholera, arrive at their acme so quickly, and then subside, as stated at page 368: continuing in their severest form so short a time; that the effects of change of place can hardly be duly estimated. We know that a body of troops having suffered severely from Cholera, and remaining in the same station during the disease, and after its subsidence; has in many instances been unhealthy for five or six months afterwards: suffering from fevers, and dysentery, with occasional cases of Cholera. Places where the residents are usually very subject to fever, have of late years been frequently visited by Cholera. These and similar facts, afford the grounds on which we should be disposed to ascribe the Epidemic Cholera to some morbid influence connected with locality, sudden changes of temperature and humidity: more especially when these morbific causes have to act on persons debilitated by disease, or fatigue and privations. Troops having marched through an unhealthy district, and who have been subject to much exposure, fatigue and privations; are very liable to the disease; both on the

march, and when they halt; whether they join a healthy or a sickly camp. Although we have positive proof, that the worst forms of Cholera have not been communicable by means of any virus arising from the persons of the sick, in India: we cannot ascertain why the causes usually exciting Cholera, do not invariably produce the same effect; and why numbers of persons are at times exposed to all those circumstances, which at other times excite the disease, and still Cholera, does not appear among them. However, as already observed, the same immunity frequently happens when persons are exposed to the ordinary exciting causes of Fevers, and many other diseases; concerning the approximate cause, and essential nature of which, we can hardly boast of knowing more than we do of Cholera."

"Contagious diseases differ in many respects from Cholera: they go through a regular course, and persons who are exposed to the virus by which they are produced, only show signs of disease at a certain period after exposure; and that interval in the majori-

ty of cases is uniform. We find nothing of the sort in Cholera, which in some cases has attacked men the day after landing from ship, and 2d day after arrival from sea, as reported by Mr. Scott, in the instance of a portion of the 41st Regiment on arrival at Madras roads. If we examine critically the circumstances connected with any attack of Epidemic Cholera at a station, we find reason to conclude, that the disease is dependent on some morbific influence connected with the locality: for it oftens happens, that a short time before the appearance of numerous severe cases of Cholera in a town; a disordered state of the digestive organs, and tendency to diarrhœa, and nausea from slight causes, having been observed among numbers of the inhabitants; after which the Epidemic Cholera bursts forth suddenly, affecting numbers of persons at the same time; and in many instances, attacking persons who have had no sort of communication with those who were suffering from the disease. Those who are sickly and predisposed, are destroyed in three or four days, and at the end of another week, the severe form of

Cholera disappears. There is no progressive course, or succession of attacks in the individuals of a town, during a severe visitation of the disease; so as to warrant the belief that it is communicated by a virus received from sick persons. Diseases which are distinctly proved to be contagious, namely Variola, Rubeola, Pertussis, and some others; attack persons in good health, nearly as readily as they do the debilitated and infirm; without being influenced by abrupt atmospheric vicissitudes, in the degree to which Cholera seems to have been, on almost every occasion when the severest epidemic visitations have occurred. Nevertheless, we are obliged to acknowledge that the contagion of Fevers, readily affects persons suffering from poverty and mental inquietude, exposed to much fatigue, ill fed, and insufficiently clothed: while men who are in circumstances which enable them to preserve a tranquil state of mind, and whose digestive organs and general health are unimpaired, are very often exposed to similar degrees of febrile contagion, with impunity. The extreme proclivity to Cholera, produced by debility, from what-

ever cause it arises, is also a very remarkable fact."

"Having already stated the entire exemption from Cholera, of those persons employed in the General Hospital, and who were most exposed to unreserved and constant communication with the sick; I am desirous to mention that when Epidemic Cholera has prevailed in Calcutta, and we have had numerous admissions of that disease into General Hospital, more especially if the wards have been much crowded at the time; we have very frequently had sick and convalescents attacked in Hospital; and there has evidently been a strong tendency among the patients who have been for many days, or weeks under treatment for other diseases, to lapse into the low form of Cholera, with early accession of collapse, coldness and cessation of the pulse. It has generally happened that those attacked in this manner, have been in parts of the Hospital remote from Cholera patients; very often in a different building, and precluded from any direct communica-

tion with those who were brought in with Cholera. Moreover, these cases of the disease occurring in Hospital, have generally happened at times when we knew that severe and sudden attacks were frequently occurring in persons living at various and distant parts of the town and suburbs of Calcutta."

"We have no doubt that debilitating diseases of any sort, and more particularly bowel complaints, render patients in Hospital very liable to attacks of Cholera of the worst description; but I am unacquainted with the history of any Hospital, which affords proof, that the most aggravated forms of Cholera have ever proved contagious."

"Mr. Hitchcock's account of the Cholera on board the H. C. ship *Abercrombie Robinson*, exhibits an excellent example of the proclivity, which debility and impaired health induce to attacks of the worst and most untractable descriptions of Cholera. That ship, direct from Europe, arrived at Bombay on the 4th June, 1828; and sailed from thence for China on the morning of the 10th August: during this

long detention in harbour, the greater part of the crew had suffered from the ordinary diseases of Europeans on arrival in hot climates, by which the constitutions of many of the men had become impaired."

"On the morning of the 10th August, before leaving harbour, the boatswain had a violent attack of Spasmodic Cholera: and no other case of the disease appeared till the night of the 12th, when two of the crew were taken ill with the low form of Cholera, attended by early collapse, but did not report their illness till next morning. In the course of a few days, 38 men were attacked with the disease."

"Of these, ten men were at the time in the sick list, and they all died; ten more were weak and in bad health, in consequence of former illness, while in Bombay harbour—of these seven died, and three recovered; the remaining 18 were well, and at duty when attacked—of these seven died, and eleven recovered. The man who first fell ill, with the exception of the boatswain, had the low

form of the disease, which commenced with collapse: those occurring at a later period suffered from the inflammatory and febrile form of Cholera. Mr. Hitchcock's narrative, is the most complete account I have seen of a local epidemic attack of Cholera: it exhibits all the circumstances connected with the disease on board a ship, whose crew consisted of about 150 men."

"When we observe Cholera to have appeared progressively along great roads and navigable rivers; where frequent communications by travellers, and much commercial intercourse exist; the idea of contagion is readily suggested, and it is not always easy for any one to give positive proof that such idea is erroneous; except a person were on the spot, and able to examine all the circumstances connected with the origin of the disease, at the time when it was supposed to have been produced by means of contagion. When Cholera appears in a town on a much frequented road, it is always possible to ascribe its importation to the travellers last arrived. When a proclivity to the disease exists at a

station, from some circumscribed endemic influence; it is evident that when travellers arrive after long journeys, during which they had been deprived of their ordinary domiciliary comforts, and subjected abruptly to change of air, water, and food: they are under circumstances in some respects resembling our recruits on arrival from Europe, who are prone to the severest forms of the disease.—Thus predisposed, it is not surprising that travellers arriving at a town should be the first attacked, when the disease was on the verge of breaking out among the residents. Much the same observation may be made respecting ships trading to a port at which Cholera appears: the arrival nearest to the appearance of Cholera, is likely to bear the blame of having brought the contagion. If we assume that Cholera is contagious, and look only at those circumstances where it is *possible* the disease may have been communicated by personal intersourse; many circumstances may be found where contagion might be *suspected:* but proofs of the fact are wanting in India, while proofs adverse to the belief in contagion are numerous."

"The character which the Cholera has assumed in many places in Russia, namely its going through a febrile stage in almost all cases, prior to the fatal termination; would render it possible that some modifications of the fever may be productive of contagion, among a crowded population, where numerous cases of the disease are occurring about the same time. However, the few accounts of the Cholera in Russia, which I have seen, described precisely the blue Cholera of India, as predominant among the most early and most frequent cases of each local epidemic visitation; terminating rapidly without reaction, as it often does in Bengal. I observe that Cholera has appeared at some Russian stations, in violent forms; attacking persons residing in distant parts of the town, who had no sort of intercourse with each other, or with those, who could be suspected of affording contagion; this was the case at Riga, as appears by the report of the Inspector *D. Dyrsen*, dated 14th May, 1831."

"It is only by the most accurate inquiry at the time, when the violent attacks of Cholera

happen in a town, that any correct judgment can be formed, whether the disease be contagious or not. A remarkable instance occurred at Razupna, where there appeared strong reason to suspect contagion; but after the most rigid investigation, instituted by Dr. Schumov, it was proved, on the clearest evidence, that there was no just ground for asserting that the Cholera had been on that occasion communicated by contagion. The circumstances alluded to, were as follow:"

"In the year 1830, when the Cholera prevailed at Orenberg, a man went from thence to Razupna; immediately after his arrival at that place, he was attacked with Cholera, and soon died. Four days after this man's death, several of the garrison of Razupna were attacked with Cholera. A most careful inquiry was immediately instituted; whereby it was proved that not one of those who were taken ill, had seen, or attended on, or been near the man who was alleged to have brought the disease from Orenberg: but on the contrary, several persons who had visited this man and attended on him during his illness, escaped

without suffering any sort of indisposition: the result of the inquiry, afforded complete proof that in this instance the suspicion of contagion was unfounded."

"I leave the question, whether the Cholera in Russia has been generally contagious, to the decision of those learned physicians on the spot, who have such ample opportunities of investigating the characters of the disease. Having witnessed the ravages of the Cholera so long in this country, we have the most profound interest in the accounts of the nature and progress of the malady in Europe. When we observe that the inhabitants of the Hill-Provinces of British India, live in small, close, ill-ventilated houses; and are clothed in woollen garments, which the poorer classes can rarely change; we might expect to find that if Cholera were hereafter to appear in those districts, its characters may resemble in every respect the disease now prevailing in Russia. Without assuming that we have sufficient grounds, to deny that Cholera may be contagious in those countries of the north of Europe, where it now rages, we

might ask, what good has quarantine and the Cordon sanitaire done? Has it either prevented the appearance of the disease, or retarded its progress in any country: or can it be supposed to have excluded the Cholera from a single house or town, in half as many instances, as we know the severest forms of Cholera to have existed, where intercourse with the sick was in no manner restricted, and still the Cholera was not propagated? Whether quarantine regulations be deemed requisite or not; it is probable that the malignant nature, and rapid extension of the Cholera, may be modified and restrained, by improving the drainage and ventilation of towns and their vicinity; in those parts of the country where Cholera exists, or towards which it seems extending: by repairing the dwellings of the poorer inhabitants, and affording supplies of clothing and food, at such moderate prices, as they can afford sufficiently to provide for their wants. Enjoining moderation in laborious occupations, and the strictest temperance in all habits: restricting the working hours in great factories, where the severity of labour, or continuance of occu-

pation appear very exhausting to human strength. We might also advise early attention to any irregularity of the bowels, whether from diarrhœa or from constipation ; and the propriety of avoiding drastic or cold saline purges, whenever a disposition to Cholera has been manifested in the vicinity."

"The early symptoms of most cases of Cholera appearing connected with general disorder of the mucous membranes ; it will be proper in cold seasons to observe carefully the progress of febrile catarrhal affections ; for the purpose of ascertaining whether any relation exists between those complaints : and to notice their mutual influence on each other."

APPENDIX.

NO. 1.

Six cases in which the inflammation of the intestinal tube cannot be attributed to Cholera, but to the improper use of medicines—to other preliminary diseases, and to the excessive use of spirituous liquors.

Observation First.

A GENTLEMAN of dark complexion and generally very healthy, of regular and moderate habits, 28 years of age, and 15 years in Bengal; awoke on the morning of 18th March, 1830, with slight feeling of uneasiness, which he ascribed to indigestion, and therefore on returning from his usual morning ride, took a small dose of Epsom Salts; soon after which nausea took place, and a cup of tea was vomited two hours after taking the salts: The extremities soon became cold and shrivelled,

voice weak and pectoral, tongue cold, countenance livid; eyes sunk, and cornea dull. The pulse gradually grew feeble, and indistinct: there were occasional slight efforts to vomit, at intervals of half an hour; and only four stools from the commencement to the termination of the attack: the two first of these stools very copious, and like gray water; the other two scanty, and of pale drab colour. There was dreadful anxiety, some thirst, and occasionally slight cramp, by which the fingers and toes were drawn up, but not very great pain. He died at 4, P. M. nine hours after taking the salts. The few cases of Cholera occurring about this time, had for the most part a tendency to sudden collapse.

The above is taken from Dr. Twining's, and it is to be regretted that the author has not given us an account of the state of the body after death; in which we might have found the mischief done by the improper use of the cathartic however small it might have been. I have not the least doubt that the above patient was labouring under the disease, or in other words, that he was in the

"initiatory stage" prior to his taking the salts, for, as the author expresses himself, "he awoke on the morning of the 18th March, 1830, with slight feeling of uneasiness, which he ascribed to indigestion." It is in the above mentioned stage that we ought to look for the affected organs in order to direct or stablish the treatment which ought to arrest the developement and the progress of the disease. The following case will show how the improper use of medicines will assist the fatal termination of the disease, and how many phenomena we find upon inspection which would not have been formed or discovered, were the patient to have abstained from them.

Observation Second.

September 12th, 1831.

James Buck—an American seaman, of strong constitution, very stout and sanguine, with a bilious idiosincrasis—about 30 years old, and no more than 20 days in Calcutta.

Fell sick on board his brig, (the Lima) at about 2, P. M. with vomiting and purging. Near four o'clock the same symptoms increased and the materials voided by both ways were, as I have been informed, very liquid and of a bilious nature. The pulse was stated to be then very weak and slow—no perspiration, much thirst and slight cramps in the lower extremities. The chief officer gave him a dose of Calomel and Jalap in "some raw brandy" which was retained about one hour, after which time the purging and vomiting were much more alarming, and the "man fell in a state of insensibility." I was called on board about 6, and found him in a complete state of collapse. No answers—no pulse—respiration cold, low and difficult—eyes sunk and his countenance very much altered. I directed the mate to place him in his birth and to envelope him with blankets; to rub his body with coarse canvass, and to apply hot water bottles and hot bricks all over his body: to give him now and then a spoonful of brandy with 30 drops of laudanum, and as much liq. ammonia;—but all this

was done to no purpose, he died about 12—10 hours after the attack. Next morning, at about 8, I inspected his body and found it quite warm, though it was extremely cold during the attack. The viscera contained in the chest offered no great morbid appearance, excepting the stomach; this was empty, very much reduced in size and corrugated. Its mucous membrane very thick and red; it was covered with a thick whitish paste. The small intestines contained a small quantity of fluid, somewhat like aqueous gruel, they were much redder than the stomach but less corrugated. The large intestines very vascular. The mesenteric glands in a state of flogosis. There was also an extreme venous congestion of the brain, but not so much in the great veins of the chest or abdomen.

Observation Third.

Pierre Francis Paussadore, Æt. 37, a French sailor, arrived in the river 15 days ago, from Peru; and has worked very hard in un-

lading the ship, which brought a cargo of copper. Had diarrhœa for 5 days past, and was seized with vomiting and cramps in his legs, at noon, on the 24th October and was brought to the General Hospital at 10, P. M. he was then in the act of vomiting, his pulse feeble, surface cold, tongue cool, the skin of his hands shrivelled, respiration hurried, voice weak and pectoral: thirst extreme.

℞. Calomel ℈i.

Confect. Aromat. ʒi. To be mixed with a little treacle and given directly. To take in two hours Ol. Ricini—Aquæ Cinnamon. ȧȧ ℥i.

October, 25th—No sleep; and no stool during the night: he vomited about an hour after taking each dose of medicine, and at two other times in the night; has occasionally cramps in the fingers and toes. Pulse 92, and free; face little flushed; skin warm; tongue rather dry and brown. He suffers exceedingly from anxiety and restlessness; voice continues pectoral, and he is quite frantic and unmanageable, calling constantly for drink.

V. S. ad. lb. i.

℞. Calomel ℈i.

Confect. Aromat 3i. to be taken at 7, A. M.

Ol. Ricini ℥i. at 10 o'clock.

To take sago with 3oz. of Port Wine at 11, A. M.

Extract. Colocynth. Comp. gr. xii.

Pil. Hydrag. gr. vi. in 3 pills at noon.

At 2, P. M.—The cramps have ceased. Blood drawn in the morning not buffy; circulation lowered; he had two scanty white stools like flour and water; he is cool, and says he feels himself better.

℞. Calomel ℈ss.

Pulv. Jalap. Comp. 3i. to be taken in treacle.

At 6, P. M.—Had no stool; thought himself rather better, but he was colder.

At half past 12, at night, had one scanty stool, like that last reported; no return of cramp; but the pulse is very feeble, and voice pectoral; skin nearly cold, and he appears anxious, low and weak.

To take sago and 3oz. of Port wine.

Oct. 26th—Slept for three hours, and says he feels much better; has no pain; tongue little furred and brown, but warm and moist.

℞. Extract. Colocynth Comp.
Calomel àà gr. v. at 6, A. M. and repeat at 10 o'clock.
Ol. Ricini ℥i. at noon.
To have 3oz. of Port Wine in hot sago.

At 4, P. M.—Had two, black, paste-like stools; moderate in quantity; tongue brown and moist: he appears better, but is still cold.

℞. Extract Colocynth. Comp. ℈ss.
Pil. Hydrarg. gra. v. in three pills now.

At half-past 9, P. M.—He had a very scanty black stool, in quantity not ℥ss. Pulse feeble and steady; tongue moist, brown, clammy, and cool; voice pectoral; hand shrivelled and covered with a cold sweat.

℞. Calomel ℈i in pills.
To take 3oz. Port Wine in hot sago.

Oct. 27th.—Had one scanty figured stool, not ℥i. Pulse 110. He suffers from urgent thirst, and inclination to vomit; surface cold.

He has a troublesome cough, and copious mucous expectoration.

℞: Pulv. Jalap comp. ʒi.
Tinct. Sennæ ʒii.
Aquæ Menth. Pip. ℥i. mixed, to be taken at 7, A. M.

Noon.—Vomited once, and had one scanty stool, like the last; he is cold, weak, and the extremities are perspiring; tongue cold, moist, and white.

Habeat Enema, purg. statim.

℞. Ol. Ricini ℥ i.
Cum. Tinct. Sennæ, ʒ ii.

3, P. M.—Nothing voided but the enema; tongue cold, very brown in the centre, a narrow red clean streak at its edges. Increased anxiety; he is eagerly calling for water, and at times delirious.

℞. Calomel.—Pulv. Scammon. Comp.
Ph. Ed. à à ϑ i. To be taken in treacle.

8, P. M.—Had one scanty black mucous stool: says he is better, but appears weak surface cold, and pulse hardly perceptible.

℞. Calomel. ℈ss. Extract Colocynth Comp.
Gr. V. Opii gr. ½ in pills, 1½oz.
Brandy in hot Sago.

October 28th. 5, A. M.—He has had one scanty stool, like tar; pulse hardly perceptible: he is quite cold, and slowly sinking; cough and expectoration very troublesome in the night.

℞. Calomel. ℈ i. in sugar.

℞. Pulv. Scammon. Comp. ʒ ss.
Pulv. Jalap. Comp. ʒ i.
Tinct. Sennæ ʒ ii.
Aquæ menth. ℥ iss. mixed, to drink after the Calomel.

At 8, A. M.—Indifferent and torpid; no stool. Sago and wine was given; also an injection of four pints hot water with pump; which was repeated in an hour and brought away some flocculi of white mucous.

Died at half-past nine o'clock.

Dissection at 4, *P. M.*—Subject emaciated. Stomach and small intestines contracted; the former pale, the latter of dull lurid colour: a quantity of water in the stomach, much

pale gray mucous and yellow bile in the small intestines. Colon and rectum pale, thin, and flaccid: liver slightly enlarged, soft, and a few small pale gray patches on its surface. Much veinous congestion of the lungs, and thick mucous in the air tubes: no other disease observed.

The author of the above observations (Mr. Twining,) continues with a narrative of some men of the crew of the ship Victorine, who fell victims to the disease; and other circumstances relative to the predisposing cause of their invasion, and finishes his observations on Pierre Francis Paussadore as follows:

"The appearance of re-action on the 25th, induced me to use the lancet, and although the force of the circulation was lowered by the bleeding, I would willingly have repeated V. S. in hopes of giving more freedom to the circulation, but the man refused to submit to it. The progress of the sinking after the blood was drawn, though not rapid, was regular and undeviating. The

general character of the attacks of Cholera on board this man's ship, was most distinctly of the low kind, tending to fatal termination with little re-action: and we are never certain of benefit from bleeding in such cases; on the contrary, we have evidence that in such forms of the disease, V. S. is very frequently injurious, and seems to shorten life."

Any one who peruses the above case will find that its subject had been labouring under a diarrhœ five days prior to the developement of the Cholera symptoms, and that his digestive organs were already diseased, at the time of the cholera attack.

Observation Fourth.

James McCabe, Æt. 23, a stout man, of dark complexion: four years in India, recently arrived from Madras; having volunteered from H. M. 89th, to the third foot; and therefore it may be presumed he has

been living in an irregular and dissipated manner for the greater part of several weeks past. Was admitted into the General Hospital, on the evening of the 11th November, 1830. Ill five days with headach, and griping in the belly. Was bled to ℔. iss. that night, and the blood was not buffy. In the next three days, he took two doses of colocynth with blue pill, and one dose of castor oil, which purged him freely. He was discharged well on the 15th November.

This man was seized on the next day with vomiting, after eating his dinner, at three o'clock; and was sent to the Hospital at six o'clock, P. M. on the 16th November. He was then vomiting with great violence, and constantly passing by stool a conjee-like fluid, with white flocculi: the surface of his body was cold, pulse feeble: and he had slight cramps in the legs.

V. S. ad ℔ i.
℞. Calomel ℈ i.
Opii. gr. i. to be taken immediately in a pill.
Extremities to be rubbed with Ol. Terebinth.

Eight o'clock, P. M.—Only 8oz of blood

could be got from the veins. No change for the better; he has just now vomited, and had a stool like conjee.

℞ Calomel ℈ i. in pills, to be washed down with this draught:
℞. Spirit Ammoniæ Aromat.
Tinct. Opii. a a ℈ i.
Aquæ Cinnamoni, ℥ i. mixed.
The draught and pills to be repeated at 10, and again at 12 o'clock.

He gradually sunk into a state of insensibility, and died at one, A. M. 17th November, 1830.

Dissection—Fourteen hours after death. Much engorgement of blood at the back part and root of the lungs. Liver appeared healthy, and rather smaller than common; its edge thin, and texture of natural softness. The gall bladder was full of green bile; its exterior covered with an adventitious membrane, apparently not of recent formation. Stomach and small intestines, enormously distended with flatus, and containing much whey-like fluid, and thick white mucous. There was no bile in the duodenum. Omentum, mesentery and mesocolon, highly vascu-

lar; small intestines in same state; mesenteric glands enlarged.

Observation Fifth.

Thomas, Holmes Æt. 45., a sailor of the ship *Bridgewater*, was admitted into General Hospital at noon, on the 8th June, 1830. A stout man, of light complexion; has been drinking spirits intemperately: seized with vomiting and purging, and cramps in the legs at 4, A. M. These symptoms continue, with aflushed face and pain in the stomach and right side. Pulse frequent and full, body warm, feet cold, tongue white, moist, clammy and warm.

V. S. ad ℔. iss.
℞. Calomel ϑi. Extract Colocynth Comp. ϑss.
Ol. Cinnamon gut. iv. in three pills. To be taken now.

℞. Spirit Ammonia aromat. ℥i.
Aquæ. tepid. ℥i. mixed. To drink after the pills.

Half past 1, P. M.—The bleeding made him faint: blood buffy, and much cupped,

pain alleviated; he is cold and appears to be sinking.

Pills repeated. Hot brandy and water to be given.

Half past 2, P. M.—Vomited once; but has had no stool.

Repeat the pills, with addition of one drop of Croton oil. Also let him have a purging enema with Ol. Terebenth ℥ ss. and repeat it in half an hour.

Half past 3, P. M.—He had two copious dark green fluid stools, after the enema; he is now warm and more tranquil; has cramps in the feet but has not vomited in the last hour.

℞ Ol. Ricini ℥i. Ol. Menth. Pip. gut. iv.
Sacchari ℈i. Aquæ Font. ℥iv. mixed. To be taken now and repeated at half past four.
Turpentine liniment to be rubbed to the extremities.

6, P. M.—He remained easier for above an hour; and in the last half-hour has had several black water stools, altogether three pints, he suffers from great anxiety, and incessantly calls for drink; tongue cold and clammy. Pulse 126, and weak; cramps very urgent; fingers shrivelled.

℞. Calomel ℈i.
Extract colocynth comp. gr. vi.
Opii gr. ½. To be taken in two pills now, and repeated at 7 o'clock.
℥ iv. oz. Sago, and Brandy ℥i. to be drank after the pills.

10, P.M.—Has been gradually sinking, and becoming more cold. Pulse now imperceptible: he had one stool the same sort as above; has not vomited, says his "head is light."

Repeat the pills as at 6, P. M.
Also let him have Spt. Ammon. Arom. ℥iss.
Aquæ tepid ℥ii.—to be drank after the pills.

Died half past 11, P. M. 8th June, 1830.

Dissection—Fourteen hours after death. Subject stout, eyes much sunk and face very white. Some old adhesions were observed in the right side of the chest: both lungs sound, their posterior part very dark coloured from gravitation of blood. Liver large, soft, and exceedingly vascular, its surface covered with star-like patches of vascularity, like the nose and cheeks of a bon-vivant; incisions into the liver bled freely. Gall-bladder small, its coats thickened; its base adherent to the colon.

Stomach thickened and pale; its interior corrugated, and covered with thick whitish mucous. Omentum and small intestines very vascular: the coats of intestines somewhat thickened and their contents deeply tinged with dark orange-coloured bile. Veins of brain turged; much effusion of serum between the arachnoid and pia-mater, in some places this effusion very milky, 3vii. of clear serum in right lateral ventricle, above an ounce of clear serum in the left, and 3iii. beneath the tentorium: the substance of the brain was firm and tough.

Observation Sixth.

Torrens, Æt. 29, a muscular man, of middle size and light complexion, a sailor of the ship *Mount Vernon;* arrived from sea about the middle of October, 1831, and after remaining a week on board, he landed on the afternoon of the 21st, and drank some spirits in the Bazaar, but says he was not drunk.—Late in the evening he was wet by a shower

of rain, and failing to get on board, he slept in a shed near the bank of the river. About midnight he was seized with cramps, followed by vomiting and purging; at nine o'clock, A. M. he succeeded in getting on board, and the captain gave him 60 drops of laudanum in a glass of brandy; after which the vomiting and purging ceased: but he remained so much distressed by anxiety and feeling of debility, that it was considered best to send him to the Hospital, where he arrived at one, P. M. Oct. 22d. The stage of collapse was then commencing: his face was pale; he was covered with a profuse perspiration, and suffering from much anxiety; the tongue white and clammy; pulse tolerably free; the belly tense and tumid. A vein was opened, and when ℥x. of blood had flowed, the pulse sunk so rapidly that it was not deemed safe to take more. Twenty grains of Calomel, with two grains of opium, were given. Within an hour the pulse rose, and the orifice of the vein being opened, six ounces more blood were allowed to flow, by which the pulse was rapidly and permanently sunk. A large sinapism was now applied over his belly, and spirit of

turpentine diligently rubbed to the extremities. The 10 ounces of blood first drawn, coagulated; and a small quantity of bloody serum separated, which on exposure to heat of 160 deg. formed a firm coagulum. The blood last drawn coagulated, but no serum separated: the crour of the blood in both cups was remarkbly dark coloured.

Calomel with colocynth, asafœtida, and oil of cinnamon were repeatedly administered; and stimulants used: and he took a dose of spirit of turpentine and castor oil, each one ounce; but no medicine had any effect; he gradually sunk into a state of torpor, pulse at the wrist ceased, and the fingers became shrivelled. He died at 3, A. M. on the 23d Octob. fourteen hours after admission into Hospital; during which period he had four scanty fluid stools of a brown colour, and vomited several times.

Dissection,—Twelve hours after death.—Muscles rigid, lungs gorged with blood, especially at the depending parts; and there was a small quantity of mucous in the trachea

and bronchial tubes. There were a few small ecchymosed specks on the right side of the heart. Some morbid vascularity of the omentum and mesentery was observed, and the glands of the mesentery and mesocolon were enlarged. The stomach was pale externally, and its coats much thickened; its mucous membrane corrugated and covered with a large quantity of thick tenacious mucous; when that was scraped off, several vascular patches of deep red color were seen. The pills in solution, and some turpentine with castor oil, which had been taken some hours before death, remained in the stomach.

The coats of the small intestines were much thickened; at no part could they be deemed paler than natural, but several portions, for the extent of a foot in length, had the minute vessels injected with red blood, in a very extreme degree. The small intestines contained much watery fluid; in some parts this was tinged with yellowish bile, in other parts of pale gray colour, mixed with many large masses of white mucous. The coats of the colon presented no morbid appearance, and

this intestine contained much fluid of dark brown colour. The liver was large, and its texture soft, the colour was natural, with the exception of a slight mottled appearance from a few small pale spots on the surface of the left lobe. Gall bladder adherent to the adjacent parts; it was much enlarged, round, and distended with very fluid bile, of a natural colour. There was a great degree of veinous congestion of blood in the brain, and the large veins along the spine were gorged with black coloured blood. Some serous effusion was observed between the arachnoid and piamater: there was ʒiiss. of serum in each lateral ventricle; and ℥ iss. below the tentorium. The preceding four observations are also taken from Mr. Twining's Diseases of Bengal.

No. II.

Clinical observations respecting the treatment of Cholera, with Tobacco Smoke Enema, and reports of the success obtained with the infusion of the Tobacco leaves.

To W. Twining, Esq.

Secretary Medical and Physical Society, Calcutta.

Dear Sir:

I have much pleasure in laying before the M. and P. Society's consideration a few remarks on the treatment of Cholera by injecting Tobacco Smoke into the intestinal tube, which I found to produce an effect worthy of attention.

It is a long time that I have worked without intermission to make myself well acquainted with all the particular characters of

that destructive disease, in order to establish a treatment which may prove decidedly beneficial in some of its different stages ; and if the one which I now bring to the Society's notice, proves ultimately to be so, I shall congratulate myself for having brought it into practice.

The 1st case in which I made my first experiment was in Goolamy, a young Syce* about 19, who having been much exposed to atmospherical vicissitudes, hard work, and bad nourishment, was seized on the 9th July, at 3 P. M. with vomiting and purging. The vomited matter consisted of the last taken ingesta, but soon changed into a dark bilious water. The stools were also liquid and bilious—Pulse ninety-five.—Extremities cold and little headach.

V. S. from the arm about eight ounces.
Hot infusion of camomile flowers.

At five the vomiting and purging increased, still of liquid nature and brown colour ; pulse about the same; cramp in the right foot.

* Hindoostanee name for Groom.

Laud. et Liq. Ammonia, àà 3ii. pro dosis.
Hot brandy and water in small doses, by intervals of 10 minutes.
Frictions all over the body with flannels.

At seven the same medicines were repeated. At nine vomiting and purging increased with tenesmus; complains of pain in the head and abdomen; pulse eighty, tongue dry and white; no urine secretion; spasms in the lower extremities; the same medicines, and hot water bottles round him. At ten, pulse sixty, body cold, eyes sunk, lips and tongue very dry and white, vomiting by intervals watery stools, very restless.

Twenty cubic inches of tobacco smoke were injected into the intestines, after which the vomiting ceased, though still a feeling of nausea; cramp and purging less frequent. Half an hour after I injected the same quantity of smoke, and observed two feculent and bilious stools; little urine discharged, pulse eighty, and soft. At eleven repeated the injection, a sensible perspiration came on and fell asleep.

10th, at five A. M.—Has slept very well;

pulse steady, soft, about eighty-six; skin warm and moist; tongue moist, red in the centre and whitish at the borders; no vomiting or purging since half past ten.

Ol. Ricin. ʒii. Laud. gut. xx. m. pro dosis.
Has taken some arrowroot, tea and toast during the day.

11th. Convalescent.

The 2d case was a Chinese shoemaker of Cossitollah* named Apoo, about forty years old, of a sanguine constitution and bilious idiosincrasis. He was seized about seven o'clock in the evening of the 14th last, with violent vomiting and purging, and also cramp in the legs. He received no medical aid until next morning, the 15th, at seven, when I was called to see him, excepting some warm water and tea which was given to him by his friends, thinking that he had an indigestion. When I saw him he was pulseless, and almost cold in every part of his body;

* A particular street of Calcutta where the principal traders reside.

very difficult to raise him, could not speak, his countenance shrunk, the eyes much sunk in the sockets, difficult and cold respiration. The tongue was cold, quite dry, and a whitish crapulous matter covered his teeth and gums; lips blue. I attempted V. S. but in vain, blood could not flow from any of the three veins which I opened. I applied sinapisms to the scrobiculis cordis and injected about forty cubic inches of tobacco smoke, at two different times, within ten minutes one from the other. These injections were retained in the intestines and soon after the pulse had become perceptible: heat was restored to the surface of the body, particularly so about the chest. At half-past eight, forty cubic inches more were injected, and a tea spoonful of liq. ammo. in a cup of hot water with a little sugar was given to him; repeated every quarter of an hour. At half-past nine, reaction of the whole system was fairly established. He complains of nothing but debility, though I consider him under a great muscular prostration, effects of the collapse and sub-irritation. The same medicine in half

quantity. At 3 P. M. the bowels were moved by ℥i. of castor oil, with gut. xx of laud. In the evening was doing remarkably well, a cup of tea and a bit of toast was also allowed him.

16th. Convalescent.

The third case was in a servant of Mr. Barrow, about 33 years old, very thin and weak. The attack came on in the morning of the 22d last, with purging and no vomiting. Two hours after 11, he began to vomit watery and bilious fluid. At noon I saw him and found his pulse about 98; lower extremities dry and cold, little cramp in the left foot; tongue moist and whitish all over; pain in his head.

V. S. ad deligum, which came on after having extracted about 9 ounces.

The vomiting was encouraged with small cups of warm water for about an hour.

At 2, P. M. pulse down to 75, skin and tongue cold and dry, cramp in both legs, his voice scarcely audible, breath short and cold, the stools very much like conjee

water, frequent and in abundance—very little vomiting—hiccough by intervals.

I injected 25 cubic inches of smoke, and 10 minutes after the hiccough stopped and the body began to assume its natural heat—20 minutes after I injected an equal quantity of smoke, and directed the attendant to give him a table spoonful of the following potion every 15 minutes.

Liq. ammon. and laud. àà semi. unciam; aqua. destil. uncias tres. sacchar. alb. Q. S. ad grat. sabor. and frictions with flannel all over the body.

At 5, I found him sitting on his charpoy.* His pulse was about 80, the skin moist and warm, and complained of pain on his back. No vomiting or stools since 4; the tongue was moist and red in the centre: a quantity of urine flowed since the last stool.—The same potion in intervals of half an hour and a little thin arrowroot.

23d, Feels quite comfortable has slept well and wishes to go out. Has had ℥ii of castor oil with gut. xx of Laud.—Sago and Tea during the day.

* A native bedstead.

24th. Convalescent.

These are the only cases in which I have made my first experiments with the Tobacco Smoke Enema, and I do not know that the substance of this plant has ever yet been administered in the same form, in similar disease, by any body else. It seems that the salutary effects of the tobacco smoke introduced into the intestinal tube is carried by an especial action, to the nervous system, for we know that the administration of this plant in any other form, such as powder, extract, or infusion, in the healthy body, is followed by vertigo; severe nausea; vomiting; a general tremor of the body; cold sweats; syncope; and when the dose is in disproportion, causes death. Mr. Orfila thinks that the active part of this plant is absorbed, and carried into the circulation. But he does not mention the nature of such an *active part.* This I think must be the infusion, of the leaves introduced into the stomach which, according to Dr. Brodie's experiments acts on the heart at once, while the essential oil introduced into the same cavity acts exclusively on the brain, leaving the power of circulation unimpaired.

The Tobacco Smoke Enema was suggested to me by my esteemed friend and colleague *Dr. Solano*, in a letter to me dated Jessore, 24th April, 1833. In which he tells me (p. 9) " Why do you not try in the beginning of the Cholera the Tobacco Smoke Enema which produces such an admirable effect in Asphyxia, and other diseases in which the principium vitale is directly seized, as in Cholera ? Though he never put it into practice himself, yet he recommended it to me very strongly. But since I have noted the above observations, a new book came to my hands, (*on the Physiology and Pathology of Cholera)* written and published last year in London, by *Mr. Greenhow M. R. C. S. L.* in which valuable production I found several cases communicated to the author by *Mr. Baird*, of Newcastle upon Tyne, which were successfully treated with the infusion of Tobacco leaf. The author of such communications explains himself in these terms :

" The remedy which I considered most likely to meet the views which I have de-

scribed* was the Tobacco infusion to be administered as an enema : how it has answered will be learned by a perusal of the cases. I have stated the formula which I used, but since I have obtained greater confidence in the practice, I am not afraid to give larger doses, when it is indicated by the severity of the cramps or other circumstances. The effects produced are not alike in every subject, but generally they may be looked for in the following succession. The first change which takes place after the administration of the enema is restoration of the circulation, as evinced by the increase of volume in the pulse, and restoration of the livid parts to a more healthy hue. The cessation of cramps next ensues, and afterwards the suspension of vomiting and purging. Last of all, the re-establishment of the biliary and urinary secretions. I have almost invariably remarked, that after the spasms are relieved, the bladder recovers its sensibility, and there is urgent desire to pass urine long before any has been secreted. I

* He alludes to the text of his communication.

consider the vomiting and purging to be vicarious exudation, which is set up by the system to relieve the blood from the excrementitious qualities, during the embargo laid upon the secreting organs, and that it ceases according to the renewal of their functions."

Now it remains to determine which of these two methods is preferable in respect to their administration. We know that Tobacco Smoke Enemas, have been administered by several practitioners in Asphyxia, by submersion, such as Mr. Gardenne, who invented an apparatus for that purpose, which apparatus has been much improved by Mr. Tisot, who has published it in regular drawings, and gave it in his work entitled "*Advice to the people on Asphyxia,* 1774;" but we do not know any thing about the administration of the infusion of Tobacco by enema in any particular disease, excepting in some cases of dropsy, dysuria, obstinate constipation, or in incancerated hernia, in which affections it has been administered with very little success, until Mr. Baird, who has given it in Cholera, and

who I believe has claims to originality in its use, cannot be disputed. For my part I have not yet tried his method and therefore cannot give a decided opinion on the subject, until experience teaches me. I mean to make some observations on this important point in order to ascertain which of the two ought to be preferred—and will do myself the pleasure to communicate them to the Society.*

I have the honour to be
Dear Sir,
Your obedient Servant.
J. N. Casanova.

August 1st, 1833.

* The next number contains a few of them. (9. v.)

After this paper was presented to the Society (August 3d,) some of its members were led to try the beneficial effects of the Tobacco Infusion Enema, and to compare their results with those obtained in Europe by the gentlemen named in Mr. Greenhow's work. But none attempted the administration of the Smoke as I had proposed, till sometime afterwards. Among those who tried the Tobacco infusion, are Mr. Twining and Mr. Raleigh, both assistants in Calcutta General Hospital. Their reports on the subject are as follows :

In one of Mr. T's cases the constitution had sunk into a state of torpor which was insusceptible to the influence of any remedy, and the Enema was of no avail. The other case occurred on the same day; the patient was tending to the same state of general torpor, and suffering from laborious respiration, severe spasms in the left thigh and leg ; vomiting and purging had ceased, there was great anxiety, and the tongue was cold. An Enema, prepared with ℥ ss. of tobacco in half a pint of water, was administered : in a few

minutes after which the spasms ceased, and did not return afterwards; in eleven minutes the respiration was more free, the pulse had more strength and was fuller, and the extremities warmer. In an hour the patient was in many respects worse, he had vomited once, there was great anxiety and lowness, with rapid weak pulse but no return of spasms, and the warmth had not ceased. An Enema of four pints of water containing in solution ʒ ii of carbonate of ammonia (at 100° Fahr.) was administered; after which he gradually revived, and small quantities of brandy in hot sago were given frequently; a moderate degree of reaction took place, and the patient recovered in a few days.

In Mr. R's. case, collapse came on early, and the disease was rapid in its progress. When the patient was first seen he was suffering severely from spasms, with coldness of the extremities, weak voice, rapid pulse, and other symptoms of collapse.* The Enema

* Mr. Twining must undoubtedly have made a mistake

of Infusion of Tobacco was tried ; its immediate effects were to render the pulse more distinct and free, (*here is the evidence of the mentioned mistake : if the pulse was perceived* MORE DISTINCT AND FREE, *after the administration of the Enema, it must indisputably have been less* DISTINCT *and less* FREE *before it. Then the pulse was not* RAPID.) and to diminish the spasms, but the dark-red colour of the face remained, the eyes were sunk and surrounded by dark areola, therefore liquor ammonia was repeatedly given, and calomel in dose ℈i. The symptoms of collapse increased towards 6, P. M. with feeble pulse and occasional spasms. The Tobacco Enema was then repeated, and draughts with ammonia were given every hour. The patient

in recapitulating Mr. R's. case (*a*) when he states the rapidity of the pulse in this subject, and particularly in the described stage, which is always low. I do not recollect that Mr. R. described it thus, though I heard the report read at the M. and P. Society's meeting on the 2d November, 1833. But I saw the patient a few hours after having entered the Hospital, and I am sure that he was far from having a *rapid pulse.*

(*a*) Proceedings of the M. and P. Society, Nov. 2d, 1833, page 44.

gradually sunk, and died eleven hours after admission into the Hospital, and less than twenty hours from the invasion of the disease.

This patient was labouring under a gastro-enteritis prior to the attack. When I saw him I questioned him on the subject, and he answered me that he had been "sick with diarrhœa and gripings, four days," which he attributed to hard work on board, and to the river water.

The results obtained from the same method in Europe, are as follows:

Mr. Greenhow relates 12 cases of Cholera, (see his work already mentioned,) in the stage of collapse, some of them suffering from symptoms which are usually deemed indicative of a hopeless state, and described to have been in the most unfavourable condition; they were treated with the infusion of Tobacco, in the proportion of ʒss. of Tobacco leaf to ℔ss. of water, of these 12 cases, six were treated by Mr. Baird. These patients had more or less of spasm, three of them were bled respectively, to four, eight, and nine ounces, before

the Tobacco Enema was administered; in one of the cases a second Tobacco Enema was given about six hours after the first, on account of a return of unfavourable symptoms. In almost all these cases, vomiting occurred soon after the administration of the Enema, the respiration became more free, and warmth of surface with increased freedom and volume of the pulse were observed; and in some cases in which the pulse at the wrist had ceased, the circulation was restored in 12 or 15 minutes. Some febrile affection occurred in several of these patients, and all of them except one recovered.

Mr. Fyfe* treated with the same medicine five cases of Cholera, of a very bad description, attended with cramps, and more or less advanced in the stage of collapse. In the whole of these cases the cramps were allayed; in four of them vomiting was very much relieved, and in three of the number purging was lessened quickly after the injections were given. In one of these cases the Enema was repeated. The whole of them recovered.—

* L. cit.

The Enemas were prepared with ʒss. of Tobacco in half a pint of water. Mr. Greenhow employed the same mode of treatment in a case of 48 hours duration, attended with spasms, and tending to a state of collapse, which had not yielded to other remedies; a good effect was quickly produced, as in the above cases, but after a few hours a return of unfavourable symptoms required a second Enema, after which all the bad symptoms ceased, and the patient had a tardy recovery.

The results of my experiments with the infusion of the Tobacco Leaves, will be found in the next Appendix.

No. III.

Four cases of Cholera treated with the Infusion of the Tobacco Leaves Enema.

Case First.

Aug. 22d, 1833.—Rahjoo, native of Calcutta, coachman, aged 37 years, tall and thin, bilious idiosincrasis. An attack of vomiting and purging came on about 2, P. M. with cold extremities and vertigo: at 5, pulse 60, small and little perceptible, skin dry and rough, corrugated about the abdomen and face, eyes sunk into the sockets, short respiration, breath cold, voice pectoral, tongue very crapulous, and whitish all over. The vomited matter and stools were very liquid, grayish, and copious. Two injections of the Infusion of Tobacco in the proportions of one drachm

to one pint of boiling water, were administered, and rejected immediately; vomiting increased soon after. He objected to the same being repeated.

Liquor ammonia and Laud. a tea spoonful of each to take at once, and small doses of brandy and water at short intervals. Frictions all over the body with dry flannels, and champooing. I proposed the Tobacco Smoke Injection, but the patient objected to it, and refused to take other medicine from me. He desired to go to his friends, and employ a native doctor.

At 7, died in a palankeen, on the way to his house. On inspection, next morning at six, I found the whole circuit of his body so corrugated, and his face so much altered, that I would hesitate to give my evidence in the affirmative of his being the same man, even his friends and relations could not recognise him to be Rahjoo. The morbid appearances found by autopsia, were as follows:

Brain and Spinal Canal, serous effusion, both hemispheres very whitish and soft.—

The Arachnoid and the Pia-mater preternaturally elastic and coloured.

Lungs. Shrunk, whitish and dry.

Stomach. The mucous membrane very much corrugated, and quite pale. The small intestines the same, and empty; the large ones contained a quantity of dark gray fluid, the liver preternaturally large and spotted, the urinary bladder full of high coloured urine, its mucous membrane quite pale and soft, the spleen much enlarged and spungy.

Case Second.

Jean Pierre, native of Nantz, in France, aged 23 years, sailor, sanguine constitution and bilious idiosincrasis, was seized on the evening of the 25th August ultimo, with vomiting and purging, after being exposed all day to the sun, and having exerted himself in working on board of his ship in taking in cargo. The vomited matter was watery, and stools bilious at first, but soon assumed the character of the conjee water, two hours after

the attack, (8 o'clock,) I was called to see him, and found him complaining of pain in the stomach and dorsal region, his pulse was about 60, extremities rather cool, no perspiration, eyes very bright, tongue crapulous, feels very thirsty, vomiting and purging very frequent and abundant. I was informed he had taken very little food during the day, but abundant drink of water, and claret with sugar. I performed V. S. from the left arm to the extent of about 8 ounces; the blood flowed at first with force, but the jet soon stopped, and ran out gutatim. The blood was very dark and thick, it assumed a light red colour; soon after it became gory and left a small quantity of serum. An Enema of Infusion of Tobacco Leaves was immediately administered, in the proportions of one drachm of the plant,and one pint of boiling water, for two Injections. The first one was rejected soon after being taken. But the second was retained about 20 minutes, after which time the patient was moved with a copious and more consistent motion; the pulse became quicker and fuller; vomiting stopt for a short time, but it increased soon after his bowels were discharged, and the

pulse diminished. I attempted V. S. a second time, as the patient was getting worse, (9 o'clock,) and the blood ran out more freely, and florid; 10 ounces were allowed to flow, and directed to be kept for inspection. I prepared the following potion, to take two spoonfuls every ten minutes,

Liquor ammonia et
Laud. àà ʒi.
Aq. Com. et Brandy, àà ʒiii. m.

and ordered the injection to be repeated every hour or two, according to the effects produced by it.

26th.—At 4 in the morning I was sent for and found the patient in a state of complete collapse. Pulse about 40, low and imperceptible, the skin cold and dry, voice scarcely audible, countenance shrunk, the eyes were shut, and sunken, cold and difficult respiration. I was informed that he could not retain either of the injections (3 only were given) nor the potion that had been prescribed; that he had been very restless during my absence, and complained very much of pain on the ventral and dor-

sal region and extremities ; that he had vomited and purged several times, but had passed no urine. An injection was immediately administered with three drachms of Tobacco in one pint of boiling water, all at once, the liquid being at the temperature of 120°. Fifteen minutes after the injection the spasms ceased, and the patient was roused from the torpid state in which he was plunged, by an inclination to vomit. Half pint more of the same proportioned infusion was injected at the same temperature, and in about 12 minutes the respiration was more free, the extremities and trunk were warmer, the pulse fuller and perceptible, (about 60,) and the perspiration more free, and particularly about the head. A tea spoonful of liquor ammonia in a cup of hot cam. flowers, was given to him, repeated every half hour.

I examined the blood drawn last night, and found it almost preternaturally florid, with a considerable quantity of serum.

27th—At 9, A. M. General reaction was firmly established. He had nausea several

times but he did not vomit ; pulse 75 ; passed urine three times in small quantities. No ventral deposition. Tongue whitish with red borders and dry. Abdomen contracted and hard to the feel ; muscular sensibility. A two ounce dose of castor oil with 10 drops of laud. was directed to be taken immediately, and tea, toast, or arrowroot for the rest of the day.

At 4, P. M. The medicine operated freely thrice, and feels quite comfortable. Pulse about 80, tongue less crapulous, skin moist, and the muscular loco-motion less sensible and more free. To continue the same alimentary regimen.

28th.—At 7, A. M. Has slept sound, and feels no pain. Convalescent.

Case Third.

August 27.—August. Arneaud, native of Marseilles, aged 34 years, ship carpenter,

very sanguine, and of an irritable temper, short, muscular and obese. The attack commenced at about 4, P. M. with frequent ventral motions, of a liquid and bilious nature; and cramp in the left leg and arm. Vomiting commenced at 6, and the cramp was felt in both legs with cold shivering. The vomited matter was at first liquid, whitish and frothy, with a strong smell of bile.

At 7.—Pulse full, and slow, 70. Extremities cold, skin dry, face very red, tongue whitish and crapulous, mouth very dry, cramps in both legs, frequent nausea but little vomiting, purging abundant and repeated, with tenesmus. He had a motion whilst I was with him, very liquid and bloodylike. V. S. from the arm of about 12 ounces. Infusion of Tobacco Leaves in the proportion of one drachm to a pint of boiling water for two injections, at the temperature of 100 deg. to take the second 15 minutes after the first and to repeat the same at 8. Plain brandy and water, in small doses, at intervals of 10 or 15 minutes, and dry frictions on the legs.

At 9.—He was sleeping sound, pulse

eighty ; skin warm and moist ; no vomiting or purging since little after the last injection, which was rejected. The bandage fell off, and about eight ounces of blood flowed from the arm. This, I was informed, happened about half-past eight. I directed the attendants to repeat the injections in the same quantities and intervals in case that the vomiting should come on.

28th.—He slept very sound till three in the morning, and consequently took nothing but some hot tea with brandy, that he wished for ; he feels quite well, and desires to have his breakfast as usual, which was not allowed. He took two ounces of castor oil with ten drops of laudanum, and directed to take tea and toast, arrowroot or sago, during the day.

29th.—Convalescent.

Case Fourth.

September 6.—Sham Mahomet Moongee,

native of Bengal, 38 years old; short and stout; bilious temperament, was invaded at about three in the morning with a severe pain in the abdomen, vomiting and purging: he was living on board of a ferry boat, which I had engaged on the day previous to cross the river, and fell overboard at about four, A. M. on his going to the privy; and remained in the water but a short time, after which he felt much worse. At five, pulse fifty, cold body and cold breath, respiration slow and whistling, voice very hoarse, much nausea, but little vomiting; purging abundant, grayish and liquid, accompanied now and then with flatus. Tongue very white and preternaturally thick, eyes dull, and melancholy mind; an injection of half pint of hot infusion of tobacco (one drachm) was administered immediately, but it produced little effect; another was given with double the quantity of tobacco ten minutes after, and was soon rejected; a third one followed it with three drachms of Tobacco in one pint of water, at the temperature of 125°, and was retained for about fifteen minutes; that went off

with much grayish matter, and a considerable flow of highly coloured urine; reaction was soon manifested, but vomiting increased for some time; brandy and water at short intervals; at seven, no vomiting; bowels discharge increased and had a bloody aspect; pulse seventy; tongue pale and crapulous: skin moist, warm and smooth. Abatement of the respiratory difficulties; voice not much altered; feels very weak, some tea and liquid arrowroot was allowed him. At noon every preternatural symptom is diminishing, except purging, which has assumed the character of a dysentery; Cataplasm emollients were applied to the abdomen and injections of the same nature were administered.

No. IV.

Second series of Clinical Observations respecting the treatment of Cholera with the Tobacco Smoke Enema.

When my first paper was read and discussed at the Medical and Physical society, a few remarks were made by some of the members respecting the treatment proposed in the same, which had for object to persuade that the sudden relief observed in the patients was not owing to the medical powers of the Tobacco Smoke, but to those of the stimulants administered by the mouth. Any one who would take the trouble of comparing their properties in similar cases, will find that they were given in such small doses, that under ordinary circumstances little benefit would have been expected from these medicines. Since this was remarked to me I undertook

a number of cases in which I have administered nothing that could be considered as stimulant, excepting the Enema, with which, the alarming symptoms ceased in a short time after the Tobacco Smoke was injected ; and the patient quickly recovered, requiring only mild aperients of castor oil.

Out of 205 successful cases which have been treated by myself and two other medical friends of Calcutta,* almost exclusively with the Tobacco Smoke, there was not one single death ; and I would be very happy to insert them all here, were it not for the short limits of the present work. Nevertheless, I shall, with much pleasure give a few of them, particularly of those which are most interesting and therefore more deserving of notice.

Sep. 4—Mr. Smith, a native of India, of European extraction, thin and of a bilious idiosincrasis ; about 28 years of age, had always enjoyed good health till yesterday ; when he felt very uneasy all at once, with nausea and

* From August 1833, to January, 1834.

inclination to go to the privy, which symptoms ceased after the administration of a little brandy with about 40. gut. laud. But on the evening of the same day a return came on and the vomiting and purging were very abundant. I was called about 2 o'clock, A. M. and found him in a complete state of collapse; insensible to hearing or feeling: extremities very rigid, no pulse to be felt any where, excepting a kind of deep humming in the chest near the heart; respiration low, cold and difficult. An injection of about 20 cubic inches of Tobacco smoke was administered, and about 5 minutes after, every one present could perceive a gradual change in Mr. Smith's appearance. The skin became warmer; the circulation was in action; and in the space of 20 minutes more, after having taken 3 additional enemas of about 8 cubic inches each, a general reaction was established. The patient could understand what was said to him and could answer by signs in the affirmative or negative to the questions put to him. He was ordered some tea and warm clothes in his bed. At 8.—He had two stools since 4

o'clock and some inclination to vomit ; pulse, much improved ; there was considerable muscular prostration, respiration more free, and disposition to vomit now and then, tongue very dry ; very little urine was discharged since the invasion.

Twenty cubic inches more of Tobacco Smoke were administered in the space of 15 minutes.

At noon—He says he feels well—Tongue warm and moist, with a crapula of whitish, mucous ; he had a copious discharge of urine, and one dark feculent stool in small quantity.

Two spoonfuls of castor oil with laud. gut. 20, were given, and some weak tea at short intervals.

At 6, P. M.—The medicine operated slightly, and he is improving in every respect.

He was allowed to take a little plain and liquid arrowroot in small doses.

5th. At 7, A. M.—The improvement con-

tinues, and he wishes to go out—but is not allowed.

The same medicine of yesterday was repeated and produced a very copious effect. Some sago and little wine and water was given him during the day.

6th.—Convalescent.

September 9th.—Maria Dacorba, native of Calcutta, of a sanguine idiosincrasis; very muscular and short, has been married about five years, and has had three children. She has been subject to chronic hepatitis since the birth of her last child, (January 10th) and was this morning complaining of a great anxiety and pain in the abdomen; about noon she vomited the contents of her stomach and purged three times.

At four, P. M. the symptoms increased and felt cramp in both legs; respiration became difficult and the materials voided were liquid and of a grayish colour.

I saw her at 6, P. M. and found her pulse quick and irregular, rather hard by intervals;

extremities cold, face much altered and complaining of acute pain in the abdomen, corresponding all over the right side as far as the spine. In fact, all this region was somewhat inflamed and very sensible to the touch. The least pressure with the finger was very painful. The tongue was red in the centre and pale round the edges.

Twelve leeches all over the part corresponding with the liver: and mustard poultices at the feet.

At eight, A. M.—The blood extracted by the leeches was about one pound, very thick and dark. She does not complain so much of that side; vomiting and purging increased considerably; pulse 90; extremities colder, cramps the same. The poultices produced no effect whatever.

Ten cubic inches of tobacco smoke were injected, and directed to take four spoonsful of strong black tea infusion, without sugar, and as hot as she could bear it, at short intervals.

At ten—She vomited twice; the cramps diminished a little; skin somewhat warmer, pulse about eighty; but still she has frequent nausea.

Ten cubic inches more were injected, and ordered to repeat the same in case that the disposition to vomit should continue.

10th.—At eight, A. M.—The patient feels much better, she took twenty cubic inches more of the tobacco smoke during the night, at different intervals, and she had no vomiting or purging since the last enema, (3, A. M.) Pulse eighty-five; skin warm and moist; no cramps; she complains of nothing except thirst. She was directed to take two table spoonfuls of castor oil and sago in the rest of the day.

11th.—Convalescent.

September 18*th*.—Antonio Gomez, a native sailor of a Burmese vessel, of very irregular habits, Æt. 28, of small size and dark complexion. He was taken ill on the morn-

ing of yesterday with vomiting and purging, cramps in the legs, and pain in the head. He took some native medicines, but derived no benefit from them. I saw him to-day, at about three, P. M. and found him with cramps; surface of the body cold, pulse little perceptible, eyes sunk, and respiration difficult. He complained much of thirst: purging very copious, liquid and brown; vomiting not so much. He is very restless, and wishes nothing but "drink," "drink!"

He took about twenty cubic inches of tobacco smoke and was ordered to be kept with warm clothes.

At eight in the evening, no relief: all the symptoms increased, excepting vomiting and purging, that he had not since six o'clock; no urine whatever; respiration very difficult and low; no answers; his pulse is not perceptible at the wrist; cold surface of the whole body; and face cadaverous.

Forty cubic inches of tobacco smoke were taken in the space of ten minutes, by injections of about eight cubic inches each, at

short intervals; and after thirty minutes time there was all the appearance of a general reaction. He was allowed to take a cup of tea.

At ten.—The man was revived and wanted something to eat; his body was warm; pulse about sixty-five: he had no return of vomiting or purging; urine flowed in large quantities twice; all pains have left him and complains of nothing but debility.

I ordered him to take a few spoonfuls of plain arrowroot, with a few drops of Madeira wine.

19th.—At eight, A. M.—He feels very weak; he slept about five hours without waking and wishes to go out.

A dose of two ounces of castor oil was ordered to be taken immediately; some tea and sago with little wine.

At four, P. M. The medicine produced a good effect. The patient is improving in every respect.

20th.—At eight, A. M.—Complains of nothing and continues convalescent.

Sep. 27, John Brown, a coloured man from Bombay : very stout and of a sanguine constitution, only 20 years of age : recently arrived from Europe : was discharged from his ship 2 days ago and has been since living in a very dissipated manner. He awoke about 2 o'clock, A. M. with violent vomiting and purging ; cramps all over his body, and great anxiety. The landlord of the house gave him some brandy and laudanum several times ; but the distressing symptoms continued worse. I was sent for at 9, and little after I saw him, he was already in a state of complete collapse. He could not speak or answer to any question ; his face was that of a moribund ; eyes sunk ; the tongue was white, covered with a crapula of the same colour and very thick ; the skin was cold : there was no pulse to be felt. The respiration cold and laborious. I was informed that the vomiting and purging were so profuse from the beginning that they had not ceased till about 7 o'clock ; since which

ume the patient lost all feeling and sensation.

I injected immediately, 40 cubic inches of Tobacco Smoke and stood by the side of his bed to watch its effects.

Twenty minutes after the last enema, there was but very little improvement.

Forty cubic inches more were injected in ten minutes time; and it was with astonishment that the attendants saw the patient, a short time after, revive from the apparent death in which he was plunged.

He was ordered some hot water to drink in small quantities at short intervals and warm clothes on his bed.

At noon—the aspect of the patient was quite different. He had recovered his speech. All the mortal symptoms disappears pulse about 30; skin warm and moist; tongue dry and somewhat white in the centre; respiration free. He wishes for something to eat.

Some thin arrowroot was allowed with little port wine in it, and some tea for the evening.

At 8, P. M.—Continues improving. He was ordered a dose of 2 ounces of castor oil for the ensuing morning.

28th.—At 11, A. M.—The medicine has produced a good effect; he had once a disposition to vomit; but it went off as soon as the medicine began to operate.

He was directed to take arrowroot, very liquid, and little wine and water with a toast for the evening.

29th. Convalescent.

October 5th.—Joseph Mendoza, a native of Calcutta, of Portuguese extraction; about 24 years old, and of a sanguine temperament, very muscular and of dark complexion. An attack of purging and vomiting came on sud-

denly yesterday evening, with violent cramps in the legs, and pain in the abdomen, which continued the greater part of the night, and had no attendance whatever till this morning, when I saw him at 8 ; I found him in a state of collapse. The fingers were shrivelled, eyes sunk, countenance much altered. I was informed that he had no vomiting or purging since 5 o'clock, and from that time he became cold and pulseless, with difficult respiration. I injected 40 cubic inches of Tobacco Smoke in the space of 15 minutes, and after that time he could speak and breathe much easier ; reaction took place gradually and he was ordered to be well covered, and little tea to be given in small doses at short intervals.

At noon. He feels much better; pulse about 80, skin warm and moist, tongue whitish in the centre with red edges: he is very thirsty, and has cramps in the lower extremities

Twenty Cubic Inches of Tobacco Smoke were injected in the space of 10 minutes, and some hot plain water to drink by spoonfulls.

Vesper. The cramps continued; he had several inclinations to vomit during the afternoon, has had two dark gray stools, moderate in quantity.

The same as before, to be repeated immediately.

At 8. The cramps have left him, pulse risen and full, he is warm and tranquil, voided some urine, tongue moist and white.

A little tea was allowed him with a few drops of Port wine in it.

October 6th, 8, *A. M.* He slept well the greater part of the night; had one fluid stool and voided urine in large quantity.

Two ounces of castor oil were given, and some tea, toast, and sago, for his diet.

7th.—*In the morning.* The medicine produced a good effect; he is anxious to go out, and cheerful; his diet was increased and the medicine omitted. 8th. Convalescent.

For the purpose of injecting the Tobacco

Smoke into the intestinal tube, I use a patent Enema Syringe, with two cocks instead of valves, to be moved by a lever, which performs the same operation as an air pump, *(such as those stomach pumps made by Maw and Son, in London.)* At its bottom end I apply the tube to be introduced into the anus, which is to convey the smoke into the intestines: at its side end I adapt a large common German pipe, or something like it, but of a good size to hold at least four drachms of Tobacco finely cut, and a good piece of fire on the top of it. In India I generally used the common Indostanee Hookah, which the natives of that country use for smoking, or the top part of it, which is called the Chillum. It is very handy and always to be had there at a moment's notice.

FINIS.

TRANSLATION

OF THE

QUOTATIONS AND PHRASES

USED IN THE PRESENT WORK.

Title Page Text.

"Un plan sistematico ès un plan absurdo; La naturaleza no conoce estas normas; ínventar un sistema y buscar pruevas es un delirio: observar efectos y deducir causas esta es una CIENCIA."

F. Varela Apuntes filosóficos.

A systematical plan is inconsistent; nature does not acknowledge these laws; to invent a system and to search proofs is a delirium; to observe effects, and to deduce causes, is a SCIENCE.

F. Varela's Phil. notes.

FIRST SECTION.

Page 6.

"Litera Scripta manet."

The written letter remains.

Page 7.

"Nec me pudet, ut istos, fateri nescire quod nesciam."

I am not ashamed, as some men, are to confess my ignorance of that which I do not know.

Page 8.

"Quod homines, tot sententiæ."

So many men, so many opinions.

Page 9.

"Fere libenter homines id quod volunt credunt."

Men readily believe what they wish to be true.

Page 10.

" Hominis errare, insipientis vero in errore perseverare."
Any man may err, but a fool only will persevere in error.

Page 20.

" Hic patet ingeniis campus."
Here is a field open for genius.

Page 26.

" Nescit vox missa reverti."
A word once uttered can never be re-called.

Page 32.

" Alterum alterius auxilio eget.
The one need the help of the other.

Page 34.

" Quacunque cernatur."
On which ever side it may be looked at.

Page 37.

" Ce champ ne se peut pas tellement moissoner.
Que les derniers venues n'y trouvent a glaner."
" *This field cannot be so much reaped*"
But that the last comer finds to glean in it.

Page 39.

" Observar efectos y deducir causas esta es una ciencia."
To observe effects and to deduce causes is a science.

Page 41.

" Ea sub oculis posita negligimus; proximorum incuriosi longingua sectamur."
We neglect the things under our noses, and, regardless of what is within our reach, pursue what is remote.

Page 49.

" Non cernimus ea, quæ videmus."
Many a time we overlook what we see.

Page 50.

" Felix qui potuit rerum cognoscere causas."
Happy the man who is able to penetrate the causes of things.

" Causa latent, vis est notissima."
The cause is concealed, the effect is notorious.

" Ne quid nimis."
Too much of one thing is good for nothing.

SECOND SECTION.

Page 58.

" Ægrescit medendo."
The remedy is worse than the disease.

Page 75.

On se sert ordinairement de plusieurs noms, pour ex primer la même chose: cependent si l'on examine tous ces noms les uns apres les autres, on trouvera qu'ils ont chacun leur signification particuliere.

Quintilianus Justit. Orat. vi. 3.

Many words are usually used to express the same thing, but if all these words are examined one by one we shall find that each of them have a particular signification exclusive to itself.

ERRATA.

Page 29,	line 14,	for	*its*	read	the.
39,	" 19,	"	*effectos*	"	efectos.
55,	" 11,	"	*of drugs*	"	of the drugs.
71,	" 3,	"	*Orinooko*	"	Orinoko.
119,	" 11,	"	*aflushed*	"	a flushed.
198.	" last,	"	(9 *v.*)	"	(q. v.)

WORKS

PUBLISHEDBY THE SAME AUTHOR.

Ensayo delas Aguas minerales de San Pedro, (in Matanzas;) noticias topograficas de su parbido, y sus propiedades medicas.—Printed in New-York, 1827.

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