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AN June 1857

ACCOUNT

OF THE

Contagious Epidemic Yellow Fever,

WHICH PREVAILED IN

PHILADELPHIA

IN THE

SUMMER and AUTUMN of 1797;

COMPRISING

*The questions of its causes and domestic origin, characters,
medical treatment, and preventives.*

BY FELIX PASCALIS OUVIERE, M. D.

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CONNECTICUT, AND RESIDENT MEMBER OF THE
PHILADELPHIA ACADEMY OF
MEDICINE.

*“ Figulus quidem figulo invidet, juxta tritum proverbium, et rara
“ est concordia fratrum. Sperare tamen licet publicam utilitatem
“ bonis omnibus cordi esse satis, ut remotis contentionibus, huic
“ soli omnem adhibeant operam.”* Wanfwieten Comm. in
Boerrh. Aphor. 1412. de Morb. Epid.

PHILADELPHIA:

FROM THE PRESS OF SNOWDEN & M'CORKLE, NO. 47,
NORTH FOURTH-STREET.

1798.

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TO THE
Medical Society of Connecticut,

THIS
ACCOUNT
OF THE
CONTAGIOUS EPIDEMIC
YELLOW FEVER,

Is Respectfully Inscribed and Presented,

BY THEIR DEVOTED FRIEND,

A CORRESPONDING MEMBER.

Philadelphia, February 12, 1792.

ERRATA.

- Page 29, third line of the note, for *introduced*, read *adhered to*.
Page 34, twenty-third line, for *Vide case No. 4*, read *No. 8*.
Page 45, fourth line, for *iliac and mesenteric*, read *splenic, &c.*
Page do. do. for *their last anastomoses* read *the last anastomoses*.
Page 59, eighth line, for *petechæ*, read *petechiæ*.
Page 70, twenty-third line, for *suppuration of the glands and parotids*, read *of the parotid glands*.
Page 97, first line, for *infiltration*, read *filtration*. This word and its derivatives have several times been thus used, which the reader is requested to correct.
Page 99, third line, for *two very remarkable*, read *four very*.
Page 114, seventeenth line, (*Vide case No. II.*) to be struck out.
Page 132, eleventh line, for *lumbary region*, read *lumbar region*.

[S] Several other errata may have escaped, for which the indulgent reader will make the necessary corrections.

For Biographical sketch of Dr. Paganini
See Hazard's Register Aug 1833 - page 123

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↵ A Short History of the Yellow Fever has been lately published in Philadelphia, in which the number of deaths has been brought, by an aggregate total, to only 988. By a comparison with previous information, this number appeared to me inaccurate, and I procured an authentic extract from the records of the health-office, by which it appears that the above total is deficient of 278; which number, added to the former, truly corresponds with my computation of about 1300.

AN ACCOUNT, &c.

TO THE MEDICAL SOCIETY OF CONNECTICUT.

GENTLEMEN,

YOU have been informed, that, in the beginning of August last, the yellow fever broke out in Philidelphia; that, according to authentic records, this malignant scourge devoured about thirteen hundred of its inhabitants; and that, early in the month of October, it had happily and absolutely disappeared.

You have known also what measures were adopted by our executive, by the board of inspectors of the health-office, and by the college of physicians of this city, to check its progress.

No doubt you have likewise read several publications on the cause or origin, and on the nature and treatment of that malady. You must also have observed, with much concern, that learned men, eminent professional characters of the faculty, were absolutely and systematically divided both in their theoretical and practical opinions on the

subject ; so that, those desirable improvements which would check its progress, and justify and establish the best mode of treatment, were unhappily retarded. But, gentlemen, the public alarm will soon subside ; and it is my hope that all regular physicians, without any party spirit or ambition to dictate to each other, will very soon surrender to striking facts, and submit to fundamental and beneficial rules.

I shall, therefore, dispense with any historical details, conceiving that they more properly belong to the province of a public recorder, or to an official authority. My only view is, to promote medical knowledge, on that interesting subject ; and it admits of nothing foreign to the obligation which is imposed upon every physician, to afford, if he can, by the means of a candid investigation, some improvements to the healing art. To physicians and to natural philosophers, in fact, the public, with confidence, entrust the task of researching the laws and evils of nature, that they may thus be enabled to protect the lives and health of their fellow creatures. My opinions and observations, however, I submit to your examination and judgement ; not pretending to dictate to any one who may think himself better informed.

I shall trace the design of my subject in order to comprise the different views under which it may be considered ; in all of which I shall con-

fine myself to well known facts, instead of arranging new theories and systems.

Firstly, I shall examine most of the opinions entertained by writers on the yellow fever, and the arguments by which they have been supported or refuted.

Secondly, I shall give a physiological description of the yellow fever, as it appeared, at different periods, in Philadelphia, and enquire into the causes to which it may be ascribed.

Thirdly, I will describe our method of treatment for the cure of the yellow fever.

Fourthly, Practical cautions for the cure, will be enumerated.

Fifthly, General means to prevent the introduction and generation of the yellow fever, will be proposed.

Sixthly, Particular preventives against the yellow fever will be recommended.

Seventhly, History of cases.—Conclusion, &c.

SECTION I.

VARIOUS and numerous are the opinions on the origin and nature of the yellow fever. The first is, that it was imported from the empire of Siam,

into the West-India islands by a French Squadron, returning from thence, in the year 1689; and which was obliged, by stress of weather, to put into Fort Royal, in Martinico*. It is true, indeed, that, as soon as these ships arrived, their crews, as well as the crews of many others, were much infected with a very malignant fever. Great numbers perished, together with many inhabitants of the island. From Fort Royal the malady was imported, by some commissioned ships, into St. Christopher's and into Hispaniola, where it made great havock. In Port-de-Paix, and several other places, its effects were so dreadful during many years after, that, in the year 1692, a royal edict, from the king of France, ordered a quarantine for all ships coming from Martinico. Two years after, and even so late as 1708, penal laws, inflicting the punishment of death, were passed in commercial towns against any seaman or passenger who should come on shore without a legal examination or permit. The malignancy of the disorder was such, says Mr. Moreau de St. Mery, "as to cause corrupted blood to run out from all the organs, and even from the pores of the skin, which was afterwards covered with bloody spots." Since that fatal epocha, several accounts have been published of a particular kind of malignant fever raging,

* Vide Description de la partie Franc. de St. Domingue par Moreau de St. Mery, p. 700.

at certain periods and seasons of the year, in all the tropical countries ; which, in all its symptoms, was nearly like the yellow fever. One of the oldest and most satisfactory accounts which we have of the malady of Siam, or of the yellow fever, is that of Mr. Pouppe Desportes*, a French physician, sent to Hispaniola, by the king of France, in the year 1732, to superintend the regulations and establishments of the hospitals in the colony. It is true that some symptoms of the fever described by that candid writer, seem never to have occurred in the American yellow fever ; but they cannot constitute a material difference. They only lead to prove, that the same disorder may take various shapes and characters, according to circumstances of soil and climate. Pouppe Desportes called the fever a pestilential one, and had no doubt of its contagious nature. He enumerated more dreadful diagnostics than any we know of. Besides the black vomit, and the jaundice, he observed that suppurations and mortifications on the joints were often its forerunners. The successive stages of the disease, as described by him, correspond with what we have experienced here ; and, from a comparative statement of the temperature and variation of the atmosphere, during many years, he drew the decided opinion, that the malady of Siam was always an immediate effect of

* Vide *Maladies de St. Domingue.*

noxious exhalations, produced by the united agency of storms, rains, and great heats.

Another respectable witness of the same disease, is Mr. Dazille, physician appointed by the king in Hispaniola, about twenty years ago*. He reports that he was called in, at Cape Francois, with three other physicians, to consult on the case of a Mr. Lambert, who had lately arrived from Europe, and thus expresses himself. "On the seventh day of his sickness, Mr. Lambert was standing up in the middle of his room, not complaining of any kind of pain. He appeared much displeas'd at our meeting for consultation, and affirmed that he was not sick. His pulse was intermitting, and a little febrile; his conversation was somewhat incoherent; and his eyes were tinged with a light yellow hue. I firmly declared to the physicians, that, in the evening, he would die. We met again at twelve o'clock; when we found him as yellow as a marigold and in a state of coma. His deglutition was already difficult, and he died at a half after seven in the evening!

"I was, sometime after, requested, by the viscount de Choiseul, to visit Mr. de Sainthenay, knight of St. Louis, &c. I found him sitting at his desk counting money. Since the fourth day of his sickness, he had been yellow all over his

* Vide Observations sur les Maladies des Nègres.

body. His countenance was anxious and much altered ; his pulse very bad ; and his skin had already that cold moisture which so peculiarly designates the last stage of this kind of malignant fever. I immediately sent word to the viscount, that Mr. de S. would die on the same day, which was, unfortunately, the case."

Experience had taught Mr. Dazille the insidious and deceiving appearances peculiarly remarkable in the malady of Siam, or yellow fever ; and he cautions his medical readers not hastily to prognosticate the fate of their patients. He and several other French writers have positively asserted that this fever was introduced into the West-Indies from Asia, about a century before. Although it has all the features of a contagion, to prove that opinion, yet it is very strange that it never has been imported into Europe, notwithstanding the uninterrupted intercourse of all the European powers with their islands. Time and experience have proved to them, that the malignancy and frequency of fevers in the tropical countries could not reach Europe. However, it cannot be inconsistent to suppose, that, if the malady of Siam had been imported from so distant a region as the East-Indies into tropical America, it might, of course, have been received in the south of Europe ; since there is no great difference between the climates of New-York or Newhaven, and those of Cadiz or Marseilles.

Indeed, if there is a difference, it surely will be favourable to the hypothesis, that such a fever could have been imported often into the southern latitudes of Europe. This was never the case, I believe, however, but once; when, in the year 1757, an English man of war from Quebec arrived in Plymouth with the yellow fever, which was very soon subdued by the climate, and did not leave the least marks of contagion.

But it may be said, that, by its nature, this fever is confined to tropical countries, and seldom or never can spread in the northern latitudes, unless it should there meet with an uncommon degree of heat, as is often the case in North America. Such objections may be refuted, by considering, that the yellow fever does not precisely break out during the heat of our tropical days, but on the return of the variable days of autumn. Shall we not then say, that the yellow fever may arise from some source colder and nearer than Siam or other tropical countries?

I find that Hypocrates has known, and mentioned the chief symptoms of this kind of malignant fever; and has noticed the spontaneous vomitings of the bile, the jaundice, and the black vomit, &c*. The warm climate in which *he* lived, could, indeed, give him frequent opportunities of

* Vid. Aphor. Hypocrat. Aphor. 22, 23, and 62, sec. iv.

observing all the effects of any infecting effluvia on the human body. His rules and precepts still hold good in the symptoms of our yellow fever. Why then should we search for its origin in distant countries, whilst we are surrounded with the same causes and circumstances that generated the yellow fever in the island of Cos, in the West-India islands, and in Siam, as well as in America?

It is an unquestionable truth, that a contagious disorder may be imported; and that this frequently happens, can be proved by many historical and recent facts. Against these we do not pretend to oppose any dogmatical assertion. But, if the malignant scourge has always been introduced by extraneous causes, and could never exist in our climate but by importation, why does it reach our shores, so late as the month of August? Why is the plague of the American tropical islands increased by the mild and moderate temperature of our autumn? If it be answered, that the contagion must acquire its growth during the hot summer of the islands, before it can be transported, they thus assert a positive contradiction. On one side, they *create* the fever in the hottest country of the earth; on the other, they *support its progress* in cooler parts and seasons. Should it be acknowledged that the yellow fever often breaks out, in the islands, during their winter, or early in their spring, it ne-

vertheless would not explain, why we do not receive it, on the return of our hot days.

An imported contagion might, indeed, be more heightened in certain places than in others; but as the contagion of the plague, the venereal lues, the itch, the scurvy, the small pox, &c. are active in any part of the world, why does not this complaint spread to our inland places, country seats, and towns; among our robust farmers and the numerous inhabitants of our back countries? Are these places so perfectly airy and refreshed, that this kind of contagion cannot reach them? Should it be answered, that in maritime towns only the atmosphere can receive and transmit the seed of contagion, it is obviously admitting that there is an unquestionable ground to assert, that the fever is generated among us.

Why is it that people, attached to a certain mode of life, and careful in the use of certain preventives, may expose themselves to the floating contagion, without fear as well as without effect? Are they more favoured by nature, disposition, and constitution? If it is said, that a perfect state of health does not admit this kind of contagion, is not, what we suppose, admitted, that an imperfect state of health will easily be acted upon by an impure atmosphere, or by exhalations from corrupted animal, or vegetable substances?

In fine, there are authentic proofs that the yellow fever has sometimes, appeared in isolated cases, in Philadelphia, and other towns. It did not spread, however, except in the years 1762, 1793, and 1797. Doctor Hilary has also observed, and positively ascertained, that once in Barbadoes the yellow fever was not communicated even to the attendants of the sick. As this strange circumstance cannot be explained, except by the state of the air, is it not enough from his assertion, and from the repeated instances in which it did not spread, to derive the grounds of our opinion, that this fever is sometimes generated by principles contained in our own atmosphere? After all these arguments, gentlemen, against the importation of the yellow fever, from Siam or from the West-India islands, it would be unfair not to take notice of the arguments by which it has been deduced from a different origin. These grounds or proofs are but few and equivocal, and most of them will contribute to support our opinion. It is said, *firstly*, that, in all places and towns in America, which have been infected with the yellow fever, it has been easy to trace its origin to certain ships from the West-Indies, &c. Now, I shall not recapitulate to you those tedious enquiries into facts that every party have ingeniously and with equal success controverted; for, should they prove the possibility of the importation of the contagion, it will not affect our doctrine. Such facts, indeed, ought rather to impress

upon our minds, the important truths of the dangerous effects of any kind of effluvia from corrupted vegetable or animal substances, which are so often unavoidably engendered in the cargoes of ships coming from tropical countries in the hot seasons of the year. Of this, there are as many instances as there are eminent medical writers, on the subject of contagion.

Secondly, The importation of the yellow fever cannot be doubted, when it is so often known to have raged on board of vessels both at sea and in port. Indeed, the French have derived their name of this fever, from its peculiar frequency among seaman; and several of their writers have called it *la matelote*. Be this as it may, two reasons are obvious, even in our opinion, to render the yellow fever more frequent among seamen. One is, that they are constantly predisposed to bilious complaints, as we shall hereafter explain; and the other, that they are continually exposed to putrid exhalations.

Thirdly, If these towns and places had not received, the contagion from tropical countries, we should find in our historical records more frequent instances of a malady that is supposed to be of a domestic origin. Formerly our summers were still hotter, and more insupportable than they are at present; and our towns, or rather villages, were destitute of any improvement, were often filthy and necessarily neglected; yet they were remarkably

healthy. Against objections so obstinately urged, I could oppose undeniable proofs of great changes in many towns and places, of variations in the air, winds, and atmosphere, from wholesome to pestilential, and *vice versa*; but we have no certain data from such fluctuating premises to direct our enquiries. It is, therefore, unnecessary to insist on them here, while we can, in a few words, satisfy our reason and judgement from well-known facts, more applicable to the point in controversy. Is it not true, that putrid effluvia, infectious vapours, and poisonous miasmata, must be more abundant and permanent, more often generated, and more fully disseminated, in populous and large towns than in villages or thinly inhabited places?

I do not find, gentlemen, among the English medical writers, any other peculiar opinion, on the origin of the yellow fever, except that of Dr. Warren, who implicitly believed, that it had been first brought from Palestine to Marseilles, and from thence to Martinico and to Barbadoes, about thirty or forty years ago. All the works I have read, agree generally in the support of the doctrine of local exhalations. It is now time, however, for me to dwell a little on the opinions which, though much divided, have nevertheless prevailed in Philadelphia, both among physicians and others. The college of physicians of this city, had officially expressed, in the

year 1793, an opinion, that the fever had been imported from the West-India islands, and that it was very contagious. They have, by no means, departed this year, from that declaration. As we have not any publication, collectively, from that body, that could exhibit more, and stronger arguments than merely their opinion of its importation, I suppose, that it is unnecessary for me to say any thing either for or against the opinion. An almost equal number of physicians, among whom are many eminent characters, have uniformly supported the contrary doctrine, that the fever was of a domestic origin; and that it resulted from corrupted substances in the cargoes confined in ships' holes, as well as from those impure exhalations to which we are exposed. Among these last, however, a distinction should be carefully made of those who acknowledge its highly contagious nature, and the few who yet think that it is not of such a malignant character. I hasten to observe, that this assertion has been repeatedly published by a few European and West-India practitioners, who have had but few opportunities of seeing many instances of the *malady of Siam*, at least in Hispaniola, where it has very seldom appeared for these last twenty years, and where they have a better opportunity of treating the *amphimerina biliosa* of Savage, or what they call *la fièvre lypyrienne*, or the *Tritacophya Americana**. These are

* Savage's Nosologia, class. ii. febr.

simply reduced to an inflammatory typhus, and to the putrid malignant fever. This capital mistake has been, consequently, connected with assertions destitute of necessary demonstration; it has exposed to doubt, and almost denied, some fundamental principles of physiology and practice, respecting infectious disorders and epidemics of camps, jails, ships, and of all crowded places*. In a word, this mistake has erected a doctrine void of the deference due to the authority of writers in the healing art of the former and present age.

I shall analyse, with more pleasure, the contrary opinion, for which documents, enquiries, and liberal and candid discussions, have been procured and unremittingly pursued by several physicians. Among these Dr. B. Rush deserves particular notice; because he has supported it, since the year 1793, both in his lectures of the institutes of medicine, in the university of Pennsylvania, and in several treatises he has since published on the yellow fever. He has never ceased to warn his fellow citizens of the presence or proximity of the cause of this contagion, in their sea-ports, wharves, streets, and stagnant waters. He has explained the phenomena of exhalation from a combination of vegetable and animal putrefaction; and, being aware, by long experience, and

* It has narrowly reduced medical assistance to the insufficient method of diluting, cooling draughts, and feeble cathartics.

an enlightened judgement, that the inhabitants of this place were particularly subject to bilious fevers during the autumn, from sudden changes, and the extremes of the climate, and from the grossness and indigestive quality of their aliments, he early understood that infectious miasmata could aggravate the bilious remittent, and convert it into a malignant and contagious fever. On this judicious ground he founded his theory and practice, and we shall see hereafter of what importance it has been to the discovery of truth, and the improvement of medical practice.

Having hitherto stated, gentlemen, the historical opinions of the most enlightened physicians of Europe and of America, I must observe, that it was my purpose to point out such of their opinions as were more congenial to the true basis of the theory to which I have confined myself; and to illustrate a position which has already occupied so greatly the public attention. I shall add a few more arguments to support the local origin of the yellow fever and its highly contagious nature.

A striking circumstance was formerly exhibited by Pouppe Despartes, a French physician, sent by the king into Hispaniola. During many years he accurately observed the state of the atmosphere in the spring and summer. He noticed, that frequent and heavy rains, interrupted by se-

rene weather, and intervals of heat, in those tropical countries, was productive of more dangerous exhalations from the earth. He was thus enabled to foretell the appearance of the pestilential malady of Siam, as he called it. He observed, also, that, after heavy rains, the noxious effects of exhalations were checked by winds, or other circumstances. A few cases from this very just authority, will serve to warn the inhabitants of our towns of the terrible effects of the exhalations to which they will be exposed, by the concurrence of rains, after long draughts, with the intense heat of the summers, if they retain among themselves all the materials of vegetable and animal corruption. These materials seem to increase with our population; and, in Philadelphia, I believe, there are more of them than in any other town in the union. They may consist of the logs which form our wharves, and which project to a considerable distance in the water; of the boards with which almost all inclosures of lots and houses are surrounded; of the roofs of all our houses; of numerous privy-houses which are seldom emptied; and of many ponds and stagnant waters, both in the city and suburbs. If it should appear strange to point out, among the sources of exhalation, the very wood which we necessarily make use of for our dwellings and ports, I intreat my reader, before he rejects my assertion, carefully to enquire into the natural laws and effects of exhalations from wood, timbers, new

ships, cellars, forests, &c. of which he will find ample documents in the writings of doctor Lind and others. Let him call to mind the number of wooden works in all our cities and ports, where the tide successively uncovers and exposes the wharves to the scorching rays of the sun, and then let him draw his conclusions.

In proof of the fermentation of animal substances, particularly during the heat of summer, which I have already suggested, I shall propose an experiment. Let a candle be lowered into a ditch, by means of a line, and it will be found, that the mephitic ascending gas, will put out the light in proportion as it approaches the surface of the earth, and this effect will be much more certain in the latter end, than in the beginning of the hot season. When this gas ascends and is received into the atmosphere, it doubtless breeds contagion and death; and I am fully satisfied, that many people have, as well as myself, perceived and smelt its effluvia, chiefly during the calm and clear nights of the month of September. Several interesting publications have appeared in the papers of Philadelphia on this subject*. From this short sketch we may conclude,

* It has been strongly contended in some of them, that the waters of the wells of Philadelphia are rendered noxious by burial grounds and other causes. I confess I have not yet heard sufficient objections to destroy this opinion. By the effect of some local impregnations, several of our wells are particularly remarked for their bad waters. A respectable chymist of this city, analysed the

that the opinion of the yellow fever being generated among us, is founded upon good ground ; and that it would be in vain to attack this opinion by the objections which have been mentioned and refuted above. For further satisfaction, we shall add, that the circumstance of its having appeared but once in Philadelphia, before the year 1793, does not imply that it cannot be of a domestic origin ; since it is obvious, that it might have actually subsisted in some or few cases, among those bilious fevers that are endemic among us in the autumn, without having been much taken notice of.

Would it be just to say, that this epidemic has never made its appearance in Philadelphia, except in 1762, 1793, and 1797, while there are creditable witnesses who have positively seen and observed it, every year since the attention of physicians and others has been kept up by the recollection of the calamity ? This fever, though so highly contagious as to be compared even to the plague, may, like the plague, be widely propagated or entirely impeded by causes that favour or oppose its progress ; for unaccountable changes and variations of heat and wea-

water of his own well, and found that it contained a quantity of magnesia, muriatic salt, and uncombined alkali. This certainly does not prove much in favour of our waters ; and I am fully aware that this subject requires a more particular investigation. I hope, therefore, it will attract the attention and fix the observation of some of our learned and philanthropic citizens,

ther, have sometimes put an end to the latter in the heat of the summer, and they have also increased it in the middle of the winter. The case No. 1, was that of a father surrounded with a numerous family of whom not one was infected but himself. The same fact has occurred to my observation, in almost every family, in which the disorder proved mortal. In such cases, the patients secrete very little of the putrid miasmata; they are much less infectious, because the poison is kept in their body to destroy the functions of life; and one of the most deceiving symptoms is, that they seldom emit any disagreeable smell. It is quite the reverse, however, when they recover; and physicians and nurses are well acquainted with the insupportable fœtor, peculiar to that fever, which exudes from their bodies, and continues, for a long time after, in their bed and clothes. Consequently one or many mortal cases of the yellow fever may have happened, without having been followed by contagion.

But it is further objected, that the traces of the importation have been visibly marked in Philadelphia; where the fever, having been communicated by somebody from Southwark, has infected the most distant part, which is Kensington, and the houses on the Frankford road; meanwhile there were but few scattered cases in the centre and northern parts of the city. This last mentioned theatre of the disease, would, however, have been preserved from contagion if the epidemic was of

a domestic origin; for the place is quite open, and presents a view of many country seats, and being not on the same straight line of the town, it cannot receive its exhalations. However striking and conclusive this whole objection seems to be, yet what will be thought at last, by an unprejudiced reader, when he recollects that Kensington, and all the adjacent grounds, are wholly a kind of naval yard, full of timber, and more than any other part of our suburbs, surrounded with marshy grounds, and stagnant waters. The adjacent banks of the river are, besides, filled up with all the rubbish of new and old timber. So much for the origin of the yellow fever in Kensington, &c.

In support of the opinion, that the yellow fever is of domestic origin, why should we not derive, gentlemen, some authority from the medical doctrine already known and promulgated in all the schools of the world; of the possible infection of disorders generated in places where people are crowded, or where unwholesome exhalations are produced? The history of jail distempers, of fevers on board of fleets, and of various disorders in camps, teaches us that it is not requisite to search for the origin of our calamity in distant countries. We must not be unaccustomed to the idea, that our atmosphere may be poisoned as easily as a plant growing in our fields. From all the corners of our extensive continent, winds may blow over us, as dreadful as the *Siroco* of Ara-

bia and as the *Harmattan* of oriental Africa. Barren and uninhabited lands, thick and extensive forests, have been known to spread, even to the distance of many miles into the sea, miasmata of contagion and death. To incredulous and systematic theorists, I shall exhibit the faithful evidences which we may derive from the instinct of ominous birds. If my mind was not distracted by error and prejudice, I saw, repeatedly, during the two instances of our calamity, vultures flying over our afflicted town. These kinds of volatile and carnivorous animals, never wander but in the currents of miasmata and putrefaction. This is the means by which, in a few hours, they reach their distant and putrid prey. This is also a proof that our atmosphere was infected with the corruption which created our epidemic. For an imported disorder cannot infect the atmosphere, any more than our sources of exhalation.

It remains now with me, gentlemen, to make a few more observations on the contagious power of the yellow fever. I have already noticed, that very few opponents have appeared against that opinion; and it is certain, it will meet with none in the schools of America. The doctrine of the noxious qualities or substances of which the air and winds may be the vehicles, has been handed down to us by Hypocrates; and wonderful improvements in chymistry have still better explained this truth, and all its phenomena; for the

idea of contagion implies nothing else but the transmission of certain principles of disorder, whether conveyed through the medium of the air or by an immediate contact. When this effect takes place, bodies are said to be infected; and surely as many disorders as by their particular effluvia always excite the same morbid state, so many must be contagious. Happily, in the long catalogue of diseases to which we are subject, these are, comparatively, few. Although contagion may arise from noxious effluvia, floating in the air, yet it seems that the same principles acquire more malignancy when they are propagated by the channel of diseased human bodies. In them, the contagious miasmata regenerate and multiply; and, if they were not checked by favourable changes in the atmosphere, who could foresee an end to a malignant contagion *! Such

* Dr. Poissonier, and Dr. Lind have transmitted us the following memorable account of the contagious fever which ravaged the fleet of Mr. Dubois de Lamotte, in the year 1757, in the town of Brest.

This fleet was, at first, joined at Brest by two ships of the line, the *Glorieux* and the *Duc de Bourgogne*, both of which had received on board some men from the hospital at Rochefort. During their stay at Brest, the contagion was so rapid, that they were obliged to send four hundred of their sick on shore.

On the 3d of May, the fleet sailed from Brest to Louisbourg, but both during their passage to, and stay in that port, the fever became general, and was attended with a considerable mortality. On the 20th of October, the fleet sailed from Louisbourg, ta-

are, alas! those contagious poisons, the elements of which are heavy and fixed; they are indepen-

king on board their sick, but leaving about four hundred in a dying state. At sea, the contagion acquired new vigour. In a very short time, the whole squadron was disabled; and, on their arrival at Brest, on the 22d of November, the few remaining seamen were scarcely sufficient to navigate their ships, having no less than four thousand men ill. All their surgeons and almoners were either sick or dead; and, when they arrived, seamen were immediately sent on board to bring them to anchor, and surgeons to assist the sick. Unfortunately four thousand more arrived, at the same time, from Quebec, in the *Bizarre* and *Celebre*, two men of war, into which the sickness was communicated by the above squadron. During the general confusion, they had been promiscuously crowded into the town of Brest, wherever they could get admission. Fifteen hospitals were at last fitted up. Physicians and surgeons came from all parts of France, and voluntarily gave their services, besides those who were commissioned by the court. The hospitals were so crowded, that at last the mortality spread among the attendants. Five physicians, one hundred and fifty surgeons, and two hundred almoners and nurses, fell victims, together with a great number of slaves, who were engaged to assist the sick, upon a promise to receive their liberty. From the attendants, the fever passed to the lower class of people in Brest, among whom it quickly diffused itself. The havoc then became general; and the houses were filled with the dying and the dead. A proclamation from authority, had promised the sick, that they would be provided with the attendance of a physician, or any other necessary means of assistance, if they would give proper notice. But, it was soon found, that, in many houses, not one was left who could give the notice, and that, in others, dead bodies had remained without burial. In fine, the month of April brought a gradual and absolute cessation of this contagious epidemic, which, in less than five months, swept off ten thousand people in the hospitals alone, besides the inhabitants who died in the town of Brest, and who could not be numbered!!!

dent of our controul, and from generation to generation they perpetuate among men, and afflict or blemish the noblest family of the living creation.

But the yellow fever, gentlemen, has manifested such particular characters of a highly contagious malignancy, that it suggested to many, no doubt, the idea of importation, which could not indeed, be denied, were there not so many and such powerful reasons to invalidate it. It was not like an epidemic which strikes only at certain individuals, of the same disposition, or defects of constitution; and thus discloses, at last, what kind of victim it endangers. It does not, like the ague, threaten those of lax nerves and fibres; like the catarrhs or influenza, falling upon the humourous; like the autumnal fevers, afflicting the bilious; and like inflammatory disorders, seizing upon the plethoric; no, the yellow fever has spared neither sex nor age. The infant in the cradle, as well as the most aged, were alike exposed to its attacks. It seemed, indeed, very general among poor, intemperate people, and in filthy houses; but we have seen also its power on those, who, among all the comforts and conveniencies of life, were unfortunately reached by it. Its irregular march and progress, its appearance in opposite extremities of the city, without any visible way of propagation, could not be explained, had

it been an epidemic resulting from general external causes, and not possessing any contagion.

Moreover, these principles and facts cannot, in the least, be invalidated by objecting, that a contagious disorder could not remain confined in maritime towns; and that, like the plague, it would have found its way to populated country places; for even the plague abated entirely in Aleppo in the height of the summer, when the extreme heat, dilating too much the pestilential miasmata, probably rendered them harmless. It disappeared in Vienna, in 1713, as soon as tempestuous winds blew away its aerial venom. By other unaccountable causes, it equally broke out during the winter and summer, and also equally disappeared, during each contrary season, in Okfacow, in the years 1737 and 1738. If the plague could be checked by contrary changes of season, and even by the heat of the summer, who will be astonished at finding that some reasons also excludes generally the yellow fever from the country? These reasons are not incomprehensible; for the pure, open, and elastic air of the country, must dispel the infectious miasmata. And there, with all the balsamic and wholesome fragrance of a useful vegetation, with all the benefit of exercise and salutary labour, preventives enough may be found against contagion.

Let us now enumerate the fundamental observations which result from this first section.

1st, The yellow fever is generated by putrid effluvia from vegetable and animal fermentation.

2^{ly}, The opinion that it was imported, one hundred years ago, from the kingdom of Siam, into the West-India islands, and from these islands to North America, cannot be admitted exclusively, to its being generated spontaneously in every warm country, from the abovementioned causes.

3^{ly}, We may more affirmatively pronounce, that the yellow fever may be an indigenous disease among us, since it was observed by ancient physicians in similar climates, and probably under similar causes; since we are exposed to such exhalations as seem adequate to its generation; and finally, since, in the past progress of the disease, there must have been some place and time in which it was generated and not imported.

4^{ly}, The yellow fever is of a highly malignant nature and contagious power.

SECTION II.

Physiological and Pathological Description of the Yellow Fever.

FROM all the documents which have been transmitted to us, both by English and French writers, there is no room to doubt, that the disorder which they have called the malady of Siam, the *mate-lote*, or the yellow fever, is exactly the same which has, in several instances, raged among us. It seems, however, that our epidemic, differs, though not materially, in some of its symptoms, from that of the tropical countries. Dr. Johnson, has, indeed, acknowledged three kinds of yellow fever. With respect to them, I shall, just simply remark, that, if there are three distinct and apparent degrees, they must be owing to the following obvious circumstances. First, that of its effects or attacks on a patient who quickly becomes its victim; second, of one who, without great difficulty, or danger, passes through its stages; and lastly, of those, who, with proper assistance, get over the resolution and crisis. These three characters, are, undoubtedly, the natural result of the different degrees of contagion, or of the constitution, habit, and previous complaints of the patient. There is consequently but one sort of yellow fever. This malady should, besides, be considered only during two of its periods, that of its *symptoms* and that of the *crisis*. In practice, this division is

a very just one. It traces, exactly, the limits of medical treatment, and is a sure mean of suggesting true prognostics*. When death is unavoidable

* I beg those of my medical readers who are professedly attached to the system of Dr. Brown, and which appears to have been introduced into the university of Pennsylvania, to divest themselves of prejudice against a theory, and to examine with candour a work, written in the good old scientific language of Hippocrates, Boerhaave, and Cullen; for I have not any prejudice myself against them. "Till this day, theories have often changed, while practice remains the same; and it was the doctrine of a celebrated author (Dr. Cullen) that medical hypothesis is but a chain to link facts together;" (*Analytical Review*, Aug. 1789, Art. viii.) I have often been induced to contemplate this doctrine, either from the consideration that men of great genius and information have adopted it, or from a determined resolution not to condemn, what, perhaps, I did not properly understand. With great reluctance, however, I would have exchanged those simple elements that so easily explain the laws of nature, the phenomena of life and vegetation, for a metaphysical theory, which, from the positive qualities of bodies and substances, carries us into a series of complex and occult modes of action. If a person can understand all the phenomena of health and life, by the obscure ideas of excitement being always evolved in a ratio to the quantity of the excitability, and exciting powers, which must always bear a due proportion to each other, &c. let him enjoy his conviction. But, why cannot the same conviction result from the simple laws of human life, as anatomy and physiology exhibit them to our observation? As for the success, which might in practice be derived from that theory, it is a delicate matter, and I will not avail myself of those sarcastic comments upon it which I have frequently read. This much I can say, that I believe the doctrine may be of some advantage with men of genius, but I am satisfied that it leads to capital mistakes, those who direct themselves by it, whilst they do not understand sufficiently the fundamental laws of nature.

ably the final result of this disorder, it is equally horrid and insidious. Penetration and attention are, therefore, the first and most essential requisites to keep us from indulging those erroneous and false hopes, which, both the patient and his friends, are too apt to entertain. A turgency of the blood vessels, or what we call a plethoric state, may, during one or two days, precede the attack, but is seldom taken notice of by the patient; and no other previous indisposition can be remarked. Whatever then may be the state of the body, the fever suddenly and tumultuously breaks out. Spontaneous vomitings of yellow, green, and glutinous bile; a depressing head ache; a numbness of the limbs, and joints; a burning heat in the face; and redness in the eyes; immediately take place. Such rapid and violent changes in the whole frame, are, I believe, uncommon in any kind of fever, and belong only to the plague. During the two first days, this state admits of but little change. Short intermissions, are, however, sometimes obtained by means of the remedies which are administered. The patient may possess all the other febrile symptoms; but I have seen none of them more frequent than delirium and coma. We next discover an ominous and absolute prostration of strength, an abatement in the pulse, an entire cessation of feeling, and an insidious security in the patient, who fancies himself fast approaching

to a recovery, and who only complains of a want of strength. He soon after, however, experiences frequent and short chills; and his evacuations are colliquative, fœtid, with yellow or white matter. He then sighs deeply; is restless; and he cannot even bear the weight of a covering upon his body. He next appears totally insensible either to heat or cold; his skin is dry; there is no kind of exhalation or disagreeable smell about him, and even very little is perceived from his breath. He has no thirst, but he can drink any thing. Nauseous medicines, or agreeable food, are alike received into his stomach without sickening it. His tongue as yet portends nothing alarming; it is covered, however, with a kind of thick white crust, from the root to the edges, which remain perfectly red. In this state his urine seems stopped, although he drinks much; and, if he voids any, it is generally purulent. This period of the disease, in which the delusion of the patient exists, notwithstanding the cessation of his regular functions, is highly expressive of the disorder being unconquerable; and I venture to assert, that when it is observed in the second or third day, it ought to determine the physician to give over, without hesitation, the least hope of a recovery. The patient will be in the agonies of death as soon as the third day arrives, and never later than the fifth.

Another more insidious stage than the former, may take place in the beginning of the disease, and last two or three days. It is not so rapid in its progress, but is equally fatal in its issue. In this case, an ardent fever, which, however may be occasionally abated by judicious remedies, is the only characteristic. Under such circumstances, how anxiously ought the physician endeavour to bring on a change or a crisis! On this point, I cannot too strongly insist: for here the deception of that sickness lies, in which it is so difficult to discover any dangerous symptoms. Several of them are, however, to be remarked.

First, Although the patient may be acted upon by medicines, he is certainly deprived of salutary evacuations; and chiefly of those which we shall hereafter describe as the only proof of a successful treatment. To be deprived of them, before the third day, is a sure prognostic of death.

Secondly, The patient complains but little; and a kind of stupidity, resulting from the slowness of his ideas, forms a striking contrast with the watchfulness and the confusion of his countenance. This symptom is more alarming, and is directly opposite to the inquisitive anxiety and irresistible uneasiness of patients in common cases. Those, therefore, who are best acquainted with the natural disposition of the person who is sick, will be best able to judge of this decisive symptom.

Thirdly, In all his actions the patient shews an uncommon degree of strength; while repeated exacerbations of fever, frequent bloodlettings, and want of nourishment, should render him very weak. This very strength, however, is unnatural and contrary to the appearance observed in favourable cases. It is the effect of an universal spasmodic constriction of the nerves, and indicates the dreadful action of the morbid cause upon the viscera, and is manifested by a kind of trill in the nerves, or by an involuntary fluttering in the muscles, which we may evidently perceive, if we keep, attentively, during a few minutes, the hand or the arm of the patient in our hand. This last sign claimed my particular notice, and it has always proved singularly useful to me.

Fourthly, and lastly, we may always discover, that each of the exacerbations of the fever are preceded by *horripilatio*, or violent chill. After these four symptoms have taken place, we should never put any dependence either on the pulse or the tongue; for, whether the pulse be febrile or not, intermitting or regular, it prognosticates nothing decisive for the patient, unless we can distinguish it hard, and tense, and possessing a spasmodic and fatal constriction. The tongue also presages nothing conclusive; it will be found white or foul all over its upper surface, and its edges red. If the patient remains for some time

without drink, a triangular red spot will appear from the edge to the centre of the tongue. But after a diluting draught this disappears; and these states take place, both in cases of death and recovery. One appearance of the tongue, however, is ominous in the first days of the disease; which is, when it turns black or brown, before the last exacerbation of the fever, which generally subsides on the fourth day. Hiccough or an absolute suppression of urine, are likewise very dangerous symptoms, if they take place before the time of the resolution of the fever; but if the first happens after it, it happily constitutes the final and salutary crisis.

Another symptom usual in malignant fevers, but particularly in this, is a kind of small red petechiæ, very similar to flea bites. They appear on the hands, the neck, the breast, and also on the face. Many suppose that they are from the bites of musquitoes, or of other insects. A physician may know better, but cannot derive from them any thing further than a proof of the malignancy of the fever. (Vide case No. 4.)

I dwell more particularly upon these apparently trifling circumstances, because they are of the utmost importance towards assisting us in our enquiries. Physicians are, alas! peculiarly liable to error in a disorder so difficult to judge, and so violent in its attacks. From an affectionate regard

to their patients, or from a reasonable pride in their own medical skill, they are sometimes overconfident of their success; and too frequently, in the event, the friends of the patient, are unhappily plunged into despair, at the disappointment of their expectations. Would it not be more prudent, then, in cases of imminent danger, to caution them against it; and thus, when the utmost of our skill is baffled, to deserve their confidence and gratitude by our candour?

I now arrive at that fatal period, when, by the deadly effect of the decomposition and mortification of the animal fluids, all the struggles of nature are entirely overcome. On the fourth day, this period is announced by the paleness of the skin and the extreme debility of the pulse; unless, indeed, as it frequently happens, a still more violent degree of contagion has, through uncommon circumstances, produced these symptoms sooner. The feelings of the unhappy patient have now lost so much of their power that he is totally incapable of giving any account of his confused sensations. His skin becomes gradually tinged with a yellowish colour, while his lower extremities become of a deep red and are a little swelled. The eyes lose that remarkable animation which they before possessed, and appear desponding; while the countenance becomes confused and grim. Nausea, at this period, is a common symptom. If drink be thrown up, it is not altered from the

state in which it was taken, unless indeed, by having acquired a ropiness, and being mixed with small flakes of dark coloured matter. A black or brown fluid, much like coffee grounds, is next vomitted. If this does not take place, it is only owing to a want of strength; and the stomach is, then, much more oppressed; and the patient may be expected to die early in the fifth day, or sooner. Stools are also frequent and easy, but very offensive. They are yellow, grey, and of a footy colour, and contain a few flakes of white or red. Delirium in this stage is very common. Frequent instances are also seen of patients preserving their reason till the last moment, (Vide case No. 4,) when a cloud suffuses their eyes, and makes them averse to the light. During all this time, the pulse is in a deceiving state. It keeps, for the most part, quite calm, and is a little febrile, or perhaps not so at all. It occasionally, however, appears intermitting, unequal, and different on one side of the body from what it is on the other. This is generally its last expression of energy, and may be owing to a spasmodic constriction. In such cases, it sometimes rises to an unexpected vigour, and is the forerunner of a temporary relief. The patient talks much of his expected recovery, and will sometimes even try, with success, to give deceiving proofs of it. He wishes to take exercise and to pursue his business. He will get up; want to dress himself; and will walk very

freely. I have seen a few who, on these occasions, were able to set in company. Every one was astonished, and would remark no other alterations than that of a deep orange colour all over his body, an incoherence in his conversation, and a very confused look. How short, alas! and deceiving is this last spark of life? A cool moisture and a total prostration of strength succeeds, and suddenly conquers this elasticity of the fibres. On a sudden, the pulse disappears; the extremities cool; the convulsions of the stomach are renewed, with acute pains, caused by a slight pressure in the abdomen; and a deplorable, though short agony, terminates the disorder, after having diffused a putrifying poison in the blood, and destroyed the noblest viscera by mortification. (Vide case No. 5.)

Such are the periods and symptoms of the yellow fever, which has been distinguished, by several writers, as a particular species of the most malignant kind. When there exists an error in the treatment, or any dangerous circumstances in the constitution of the patient, he must certainly fall a victim. The disease remains the same, however, in its nature and operation; and we will find, among those who happily recover, no other changes than those which constitute an issue prompted by accidental or unavoidable causes, and which take certain modifications from the constitution, the sex, the age, or previous indisposition of the

patient. Let us now direct our enquiry further, by a review of the different stages of the malady, when it can be conquered by nature or by art.

It was the doctrine of Hippocrates, that, on the breaking out of any acute malady, there were symptoms pointedly prognosticating its fatal issue, or the probability of its cure. Thus he remarked, that, if the patient, on being taken, was discovered involuntarily to shed tears, or if he was seized with convulsive fits, he would either die, or labour under a very long and dangerous attack. Medical practice, in our day, is, however, greatly improved, and is attended with far different and happier results. We have seen and known many who have recovered from pestilential and malignant disorders, who, at first, had exhibited the most portentous symptoms. (Vide casés No. 6 and 7.) Whatever these symptoms may be, in the first day of the disease, any unfavourable judgement must be suspended. In fact, if obvious indications have been faithfully followed, on the second day, we may discover beneficial and critical perspirations, remissions of the fever, and salutary evacuations. The latter must be repeated, copious, and of a dark green colour. Instead of that prostration of organic strength, which we have noticed above, the patient complains only of a natural weakness; and when he takes refreshment, by a few hours of sleep, he keeps a peaceable situation in his bed. Upon comparative obser-

vation, it must be acknowledged, that, instead of weakening the organic sensations, the yellow fever irritates and heightens their powers; for, if but a slight dose of physic be given to the patient it will be very powerfully felt. His taste is likewise equally affected by nauseous medicines, by refreshing liquors, and by the most wholesome nourishments. The coma and delirium may take place, without being ominous; the pulse may be rapid and revulsive without a convulsive constriction. The least noise provokes in him a sorrowful anxiety; but this symptom is far better than a deceiving security and a portentous cessation of his complaints. The fever keeps the patient, generally, in this situation for three days. On the fourth, the change operates; and is, indeed, connected with some apparently dangerous circumstances, which are very critical; but, which, in the end, become salutary. The chief of these are, the affection of the stomach, and its repeated nausea, joined to frequent vomitings, attended with a pain which a gentle pressure acutely exasperates. Proper medical assistance gradually relieves this and other accidents; but, until the sixth day, no safe proofs of a good issue are to be perceived. Should, however, a few paroxysms of fever be repeated, so much the better, provided they are unattended with a chill. These will serve to determine a happy resolution; for the yellow fever, when treated with success, runs like the *causos*

or febris ardent, and is remitting during seven days. The yellowness of the skin usually appears after the exacerbation of the fifth day. It is not interspersed with any shade or red spots, and there are scarcely any which are apparent on the extremities. This jaundice begins to disappear on the seventh day. In the beginning, the tongue does not much differ from what I have above described in the worst cases. In these cases however, it every day acquires a more uniform paleness, or small red spots; and upon the whole seems of a more spongy and porous substance.

It is a general observation in medicine, that in proportion as the resolution of an acute disease is perfect, the weaker the patient afterwards feels himself. This state of the body is also, one of the best means by which we can judge of the safety of organic life. Agreeably to these principles, the patient who recovers from the yellow fever undergoes great exertions and a very difficult struggle. In this exhausted state, he is doomed to a tedious convalescence, and may esteem himself happy if he recover from it in a space of time equal to that of the disease.

Several other circumstances more particularly designating the character of the yellow fever, when carried to a successful issue, remain to be mentioned.

The West-India writers have observed in this disorder, some singular symptoms, many of which were seldom seen in the American epidemic. They may, however, from obvious circumstances, become symptoms of death, or crises of a cure. These are,

1st, Hemorrhage from the nose.

2^{dly}, Swelling and suppuration of the parotids.

3^{dly}, Anthrax, or any other eruption on the skin.

4^{thly}, Aperture of the orifice after bleeding, attended with a mortification of its edges.

5^{thly}, Acute pains on the limbs, and suppurations on the joints.

6^{thly}, Spots of dry mortification.

I frequently saw the first of these in Philadelphia, and it proved fatal or not, according to the pathological rules of Boerrhaave:

“*Si Tertio vel quarto die parca, Lethalis; optima fiet die decretorio.*” § 741.

The second has occurred, though seldom, in my practice. When it did appear, it was perfect, and generally succeeded on the fifth day, and always immediately resolved the malady.

The fourth presented itself as an hemorrhage. This I attributed to obvious circumstances. The mortification of the orifice of the veins, however, I have seen in almost all the dying subjects; of the third and the last I have met with but one instance.

The fifth frequently took place as a pain, but never as a suppuration.

Upon the whole, the only critical diagnostics which have been peculiar to the yellow fever of Philadelphia, were, the hemorrhage and the swelling of the parotids*; but these very diagnostics, together with the jaundice, were either favourable symptoms or forerunners of certain death, according to the time in which they appeared. In fact, we learn, by the pathology of the human body, that, in all acute disorders, Nature requires a certain space of time either to cure, to resolve, or to disperse the morbid cause under which the body is labouring; and the most perfect proof that the attempts of art or of nature have failed is when we too early discover incomplete effects or a false crisis. Of these however, an explanation will be given in the section on the treatment of the yellow fever; notwithstanding I shall explain the real pathology of one of the most horrid disorders that ever afflicted the human race.

* The first were commonly from the nose among men, and from the uterus among women of a competent age.

I here repeat with confidence that nothing but facts will be the basis of a theory that has no connection with any new system, and which will be an answer to these questions why the yellow fever is attended with spontaneous vomitings of the bile, with a jaundice, with black vomit, &c. ?

The opinion that the yellow fever is a true bilious one, and differs only in degree, which is the highest and the most malignant, has been already known and satisfactorily proved by Dr. B. Rush*. With this principle as a guide, many errors, systems and conjectures might have been long since dispelled, or at least better explained. The history of its symptoms, exhibits, in the plainest manner, the corruption and malignancy of the bile. As soon as the patient is seized, he spontaneously vomits bile; and if he recover, it is by the means of successful and copious evacuations of hepatic and cystic bile. If he die, it is evidently in consequence of the mixture of the bile with the blood, and the mortification of all its viscera and reservoirs. All the anxieties, nausea, pains, obstructions, and exacerbations of fever, in every case, seem evidently caused by the fermentation, the stagnation, and the acrimony of the bile. In short, if morbid bodies be examined by dissection, new ravages of the bile are also discovered. From

* Account of the bilious remitting yellow fever, &c. in the year 1793, by B. Rush. M. D.

these facts, what other inferences can be drawn, but that of fixing the pathology of the yellow fever in those laws and accidents that are connected with the bile. In order then to establish some reasonable ground, let us first enquire to what uniform cause we may attribute all the above mentioned symptoms.

Hippocrates has observed*, that autumnal fevers were attended with jaundice, in consequence of people living upon rich beef, and Boerhaave† admits acrid bile and poison among the causes of the worst kind of jaundice. The liver, from its nature and functions, receives a great quantity of blood from the *venaporta*, to prepare the bile; we may therefore conclude, that diseases of that viscera, might disturb or alter the bile, and *vice versa*. But, if a poisonous exhalation has, by its affinity with the bile, diffused itself in the alimentary canal, it is very probable that the infection will early reach, by many known passages, its very source; and the liver, the gall bladder, the duodenum, the stomach, &c. will then be diseased by a poisoned fluid, which stimulates, inflames, and corrodes them. Hence *the spontaneous vomitings of the bile*. Besides, before this infected bile could be sufficiently diluted, neutralized, and evacuated, it is obvious to think, that the whole liver, being affected either direct-

* Aphor. 62, Sect. IV.

† Icterus multiplex. § 916.

ly or indirectly, will no longer be so easily infiltrated nor receive that mass of blood it ought to admit; and this, by revulsion, will pass down the iliac and mesenteric veins to the last anastomoses with the smallest arteries; and hence the violent *and inflammatory fever* with all its attending symptoms. Nature has but two or three days to support the violence of such a struggle. The poison ceases not to act upon the very texture and membranes where it is inclosed; it may perhaps be poured again* from the liver into the duodenum and the stomach, with stronger acrimony; and there is always enough of it to contaminate the blood in the venaporta and that of the vena cava, from which it mixes at last with the general mass, and produces the *black vomit and the icterus*. I need not to relate all the other ac-

* I have it in my power clearly to prove, that the black vomit is the hepatic bile itself, which is completely corrupted in the liver, and consequently mixed with the blood, by an authentic fact, taken from an account of the dissections of Dr. Physick and Dr. Cathrall, published in Dr. Rush's account of the yellow fever of 1793, page 121.

“ In two other persons, the stomach contained, as did also the
“ intestines, a black liquor, which had been vomited and purged
“ before death. This black liquor appears clearly to be an alter-
“ ed secretion from the liver; for a fluid, in all respects of the
“ same qualities, was found in the gall-bladder. This liquor was
“ so acrid, that it produced considerable inflammation and swell-
“ ing on the operator's hand, which remained some days. The
“ viscous membrane of the intestines, in these last two bodies,
“ was found inflamed in several places.”

cidents of gangrene, hemorrhage, eruptions of any kind, and of death; because, to my medical readers, this theory, founded upon facts, will be sufficient to account for every thing. Another striking proof in favour of this theory, may also be drawn from the march of the disease in a recovering patient. His cure will either be rapid or tedious according to the efficacy of his evacuations, which, at first, being chiefly composed of the cystic bile, appear very green, but afterwards turn to a yellow colour, owing to the hepatic. It must, however, still be remembered, that no symptom, diagnostic, crisis, or accident, can better designate any future success, than a continued and uninterrupted evacuation of the bile. After all these physiological and pathological arguments, we must undoubtedly conclude,

1st, That the yellow fever is the first and highest degree of malignant bilious fever, the proximate cause of which is a contagious gas received into the alimentary channel, and into all the viscera of the bile; and that this original circumstance distinguishes it from the plague, which is produced by a poison immediately received into the blood.

2dly, The contagious miasmata which constitutes the yellow fever, is, at first, received into the bile. It there alters it and stops its circulation, excretion, and secretion; and it afterwards, by

its acrimony, inflames and produces a mortification of the abdominalia, and a decomposition or putrefaction of the blood*.

3dly, It appears, also, that there is but one fort

* My dissertation in answer to the honorary prize-question proposed by the Medical Society of Connecticut, in the year 1795, on the chymical properties of the yellow fever of New-York, &c. contains a theory apparently contrary to the above physiological and pathological arguments. It is consequently requisite for me either to make some apology or to give a proper explanation. Were no improvement to be expected from repeated instances of the same facts, any scientific attempt would no longer be praiseworthy, nor repeated investigation meritorious. My theoretical conjecture, however, that the caloric of a hot summer, might produce, by the absorption of aqueous particles, the fermentation or putrefaction of the blood, and thus create a malignant fever, is the natural result of adopted elements and principles. By the help of these, we never fall into contradictory opinions, although we are liable to mistaken applications. Besides, I had long since suspected that contagious effluvia might contaminate and corrupt the animal fluids, as well as that they might be altered by the loss of some of their component parts; and this was my belief in the above mentioned dissertation. "It may be said, that contagious miasmata, whether imported or locally produced, when admitted into the blood, will cause its putrefaction. We know that there are some proofs of such dreadful effects, and we are acquainted with the deleterious qualities of mephitic air. There are, no doubt, other causes, which also destroy the equilibrium of our component parts. There are, in fact, chymical phenomena, which may arise in any town or neighbourhood where there are pestilential effluvia." Vide *Dissertation on the prize-question proposed by the Medical Society of Connecticut on the chymical properties of the effluvia of the contagion of the yellow fever in New-York*, Art. XI. p. 9.

of yellow fever; that its different degrees of malignancy originate from obvious circumstances; and that the disorder will prove fatal or not, according to the mode of treatment, or to the nature of the constitution and previous state of the body of the patient.

4thly, There are but two periods of the disorder, that of the *symptoms*, and that of the *crises*. The first generally last three days, seldom five, and instances have even occurred of but one day. The crises always prove mortal if they appear before the third day.

The *symptoms* are, spontaneous vomitings of the bile, or nausea; violent fever; sickness of the stomach; florid state of the face; restlessness; pains in the limbs and in the back; and a prostration of strength.

The *crises* are, hemorrhages; swelling and supuration of the parotids; petechiæ; jaundice; fluxes from the bowels; and black vomit.

5thly, In cases of recovery, the fever is remittent during seven days, like the *causos* or febris ardens; all the crises may safely take place on or after the fifth day, except the black vomit; but early and profuse evacuations of hepatic and cystic bile are the only critical signs and proofs of next recovery.

SECTION III.

Method of Treatment of the Yellow Fever.

WITHIN these last five years, the period in which the yellow fever has made its general appearance in America, several methods of treatment have been published here; and the same subject has also been ably discussed by many eminent West-India writers. I will not, gentlemen, attempt to comment or decide upon the respective merits of either; but, I must confess, that I have never yet been able sufficiently to discover by what indications the use of their remedies was to be directed. Thus it frequently happens that they sometimes succeed and sometimes not; and the mercury, bleedings, bark, cold or warm baths, acids, blisters, &c. often failed even in the hands of those who contended the most warmly for their application. If they afterwards attempted to explain under what circumstances their proposed method has failed, they have generally offered vague pretences and uncertain rules. Let us then, with candour, declare this unexceptionable rule in medicine, that no method of cure should ever be depended on, unless it be founded on such

rational grounds that the remedies employed will answer, under every circumstance, the indications of the disease. Experience has, at last, proved that bleeding and mercury are sufficiently powerful to conquer the most malignant degrees of the yellow fever; yet, in the use of these remedies, the greatest care and circumspection are requisite in order to insure their success. Before I enter upon the explanation of my method of treatment of the yellow fever, and of the proper mode of administering these fundamental remedies, suffer me, gentlemen, to observe, that, in America at least, Dr. B. Rush has the honour to stand foremost in support of their efficacy. While no other method seemed equally successful, that of venesection and calomel was supported, during the two instances of our calamity, notwithstanding the most bitter invectives and sarcastic publications were continually levelled against it. Some unfortunate and unsuccessful cases were held out as proofs of its danger; and the charge of profuse and indiscriminate bleeding was exhibited as a murderous practice. These objections, however, when weighed with impartiality, will be found to result from the unavoidable inconveniencies of a temporary and violent epidemic. One may arise from the *method of indications*, which cannot, in cases so uncommon, be equally well-understood by every physician; and

the other, from the impossibility of conducting the sick with regularity and dispatch, among so great a number of patients, who are often deprived even of the necessary accommodations, or who frequently mistake their own cases; and who, in the height of their despondency, communicate their terrors to the attendants. Too *profuse and indiscriminate* bloodletting, may have occurred in several instances; but I am happy in asserting that, as far as I am acquainted with them, they could not be fairly derived either from the private or public opinions of Dr. Rush. It is, therefore, peculiarly pleasing to me, that I am thus able, in some measure, to vindicate the character of an eminent and humane physician; and more especially so, because in some points of theory I may be found to dissent from him.

It is only from the pathology of the yellow fever, that any safe or efficacious rules for its cure can be derived. For every judicious observer, will candidly acknowledge, that, if the numerous remedies which have hitherto been recommended for the yellow fever, have produced a cure, they have likewise too frequently failed. If then it be a fact, that the contagion peculiarly connects itself with the bile, and corrupts it, we may clearly and safely establish, as a *first indication*, that the bile ought to be speedily evacuated, purified, and renewed. If it be true, that

the morbid state of the bile causes its stagnation, produces obstructions in the liver, and prevents the entrance of a considerable quantity of blood into that large viscera, we may point out as another *fundamental indication*, the necessity of speedily opposing the immense revulsion of the blood in the arterial system, which increases the general spasms, together with all the symptoms of inflammation, and which continually endangers the life of the patient*. In fine, if it be a fact that the bile, when infected, will contaminate the blood, and *vice versa*; and when the whole frame, labours under imminent danger of putrefaction, that the animal fluids must undergo a depuratory crisis within a certain space of time, and that by the means of natural or artificial exertions, it will be necessary to be well-acquainted with all the accidents attending malignant and putrid fevers, to accomplish *all the secondary indications*, and to obtain, as regularly as possible, a perfect resolution of the malady, without unnecessary or dangerous means. To give, however, gentlemen, a

* I find with pleasure that the theory of this pathology has been already adopted by respectable writers, and has been ascribed to the bilious fevers of warm countries, among which our yellow fever is of the first and most malignant degree.

“ Whenever there is a deficiency in the powers of the circulating system, the larger vessels are distended, particularly the vena portarum; this causes the bilious evacuations in warm climates.” *Critical Review for May, 1795, on Russ's bilious yellow fever.*

more explanatory view of *primary* and *secondary indications*, for the mode of treatment of the yellow fever, suffer me to exemplify them by the following historical case, wherein I shall notice the minutest circumstances, both with regard to the disease and to the medical prescriptions which were administered.

T... B... about twenty-two years of age, was of a sound constitution, and of a regular life. He had lately lost his father and a brother in the prevailing fever. After their death, he, with the rest of the family, went into the country; but he had already been infected with the contagion. This was soon manifested by all the alarming symptoms, but chiefly by the spontaneous puking of the bile. He was immediately carried back to town, where proper assistance might be obtained; and, before a physician could be sent for, an experienced nurse had ordered him to be copiously bled, and had given him a dose of salts. These orders were good but insufficient, and nothing further was done until the evening of the second day. At this time I was called in, when I found him extremely ill, and very nearly approaching to that prostration of organic action which does not even give time for an exacerbation of fever. Having just lost his parent and a brother with this same disease, he could not but consider himself also as a devoted victim. His spirits were, there-

fore, uncommonly low, and he appeared involuntarily to shed tears. This circumstance, agreeably to the rule of Hippocrates, I considered as an ominous and fatal prognostic. A confused and grim countenance, cold extremities, and a hard and low pulse, marked the rapid progress of the disease, during only thirty hours of sickness. All the good effects that might have resulted from the first copious bleeding, had been lost; since no proper help had been administered for the evacuation of the bile. My first consideration was, therefore, to endeavour to raise the exacerbation of the fever to its natural course; for without it the disease can never go regularly through its different periods, and the patient will irrevocably die, if he is so much exhausted that it cannot be produced. To obtain, therefore, this desirable change, I depended much upon the action of the mind on the nerves, and endeavoured much to raise the hope and confidence of the despairing patient. While I kept his pulse and hand within mine, they acquired a sensible energy. His extremities became warm; and, wishing to remove every obstacle to the operations of the treatment, I immediately ordered a carminative and nitrous injection. Thus I considered that the previous congestions of the fœces might be discharged, and that the subsequent and necessary evacuations could no longer be retarded. At night, the patient was, agreeably to my wishes and expecta-

tions, seized with a violent exacerbation of fever, attended with delirium. This state gave the positive indication of a copious bleeding; for by it I fulfilled the second fundamental indication abovementioned, viz. that of emptying the blood-vessels, when the blood can be no longer admitted into the liver, and when the large vessels are in a state of infection. Agreeably to this indication, the patient lost fifteen ounces of blood on the night of the second day. Without losing time, the bile was to be evacuated; for a favourable relaxation, and an absolute cessation of spasms, irritation, and inflammation, always succeed a copious bleeding, and at this time the medicines have consequently more power. I directed the patient, therefore, to take immediately, and every two hours after, a dose of calomel *ʒvi.* jalap, *ʒx.* and scam. of Alep. *ʒii.* This prescription was to be alternately followed with proper diluting and cooling drinks. On the third day, the medicine operated satisfactorily; for a prodigious quantity of green or cystic bile was evacuated. The pulse, however, exhibited a state of constriction, and the stomach was sick.

Let us now venture a few conjectures on these unfavourable symptoms. Among the remedies which we employ, there are many, whose power and efficacy we can understand and analyse; but there are others also which may answer all our

wishes, without our being able to account for their successful operation. Thus, if in the remotest foldings and cavities of our viscera, there exist a corrupted fluid which we wish to evacuate, it is obvious that venesection, affecting the whole system and distending the nerves and the vessels, will operate on each diseased part; yet how does it happen that a mercurial powder so effectually obtains the secretion of the hepatic and cystic bile? This circumstance, as well as that of the same effect being produced by the regulus of antimony, when taken into the stomach, cannot as yet be explained. In the case now under contemplation, twelve grains of calomel, mixed with other drastics, was sufficient to evacuate a great quantity of cystic bile. It was not, therefore, improbable, that by a continued action of the mercury another quantity of bile might be forced out and secreted from the liver to the duodenum and the stomach. It was the acridity of this bile which caused the constriction of the pulse, and which sickened the stomach. Under these circumstances I considered it safer to effect its evacuation by a vomit than otherwise; and I consequently ordered an emetic. It produced the happiest effects; for, at the close of the third day, the patient had scarcely any inflammatory symptoms, and enjoyed a visible remission of fever. His skin appeared moist; and his countenance was more cool and placid. All his sensations were agree-

ably affected by the comforts of a good bed, and a room warmed and purified by a chimney fire.

It should appear, gentlemen, that our patient is now brought, from the most perilous state to the point of recovery. The *moles movenda* of the arterial system, and of the large infarcted vessels, have been relieved, and the contaminated bile evacuated. Thus, therefore, two important indications have been timely fulfilled; and the actual state of the patient appears to be that of the *vis vite*, which always marks the beginning of the convalescence. But you will remember that the last indication has not yet been obtained, and that, within a certain space of time, it must be effected either by natural or artificial exertions. This indication has already been described as relating to the depuratory crisis of the whole fluids, when they have been more or less contaminated; and it comprises all the *secondary ones* for the treatment of malignant and bilious remittents. It is beyond the power of medicine to abridge the courses and periods of these fevers. But, notwithstanding their different stages cannot be so accurately traced as would enable us to form a nomenclature, yet some general rules have been deduced; and, upon the authority of these, it must be allowed, that the bilious remittent, like the *causos* or *febris ardens*, must last four or seven days, and may even be protracted

to nine or fourteen. Exceptions to this march are very scarce ; and the case No. 6, which was perfectly resolved in three days, I never could account for in any other way than the following. By the *primary* effects of the contagion on the bile, the patient did not receive its *secondary* transmission into the blood, and had not consequently the elaboration of nature to suffer, but was cured as soon as the evacuations of the hepatic and cystic bile were obtained.

But, gentlemen, the illness of my young patient did not end at the point I have last mentioned ; for I soon discovered another paroxysm of fever. For the relief of this I prescribed gentle remedies, such as carminitive injections and diluting draughts ; and a previous warm bath had been applied to the inferior extremities and abdomen. You will thus perceive, that I consider mild operations only as desirable, during the exacerbations of the fever, except that bleeding is requisite when its inflammatory characters are too high. In the present case, I could see no urging necessity for venesection ; for the bile had already been evacuated, and the remission of the symptoms and fever had been regular and uniform. Besides endeavouring to preserve the life of his patient, a physician should be careful in the use of those means which, by their frequency, may create other diseases, or render the convale-

scence very long and perilous. On the night of the fourth day, the fever of the patient was so violent, that, in his delirium, he got up and went naked into several corners of the house. How wonderful, gentlemen, are the exertions of Nature when she is properly assisted! As soon as this exacerbation was over, the patient had several copious discharges of bile; red petechæ were observed on his breast and arms; and his salivary glands being a little affected, he had a salutary and frequent spitting. The crisis peculiar to the malady was now beginning to appear. The redness of the skin began gradually to change to a whitish hue, which I judged would, at a proper time, turn yellow. What were then my observations; what was I to do; and what had I to expect? The revulsion of the blood from the veins into the arterial system was certainly finished; and the corrupted bile, by which the liver was infarcted, was secreting and diffusing partly in the bowels, and partly in the blood. Mercurial drastics were still necessary; and, by their means, I again procured copious evacuations of yellow bile which was probably from the liver. On the fifth day, the yellowness was visible; a quantity of this stagnant bile having mixed with the blood. It was then necessary to accelerate and stimulate the circulation by sudorifics and tonics; and the stomach, being languid and exhausted, some restorative and nourishing substances were

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to be administered. Thus, from the fifth to the sixth day, the patient was assisted, and enjoyed some natural sleep. His fever had been very moderate and attended with but little delirium. On the sixth, observing no further existing cause of irritation, I ordered a mild nitrous cathartic to keep up the motion of the bowels, and to prepare, by natural evacuations, if possible, the approaching final resolution of the malady. This took place, during the night of the seventh day, by an equal and profuse perspiration, by copious urines, containing a thick yellow sediment, and by repeated discharges from the bowels. I then desired that the patient should be put in clean linen and in another bed. I must not, however, omit observing, that the sheets and clothes with which he had been covered during the last days of his illness, were spotted with a kind of yellow purulent matter, and had a very offensive smell. This circumstance is always a striking proof of the final depuratory crisis terminating a malignant fever, and more peculiarly exhaling the contagious miasmata of the yellow fever,

From this moment, the patient could not, with any probability, experience any further exacerbations of fever; and he wanted no further assistance than such as is necessary to convalescents. He was in this state during five or six days, and a gradual nourishment, with two grains of

opium, given at night, were for some time administered. This remedy is very restorative after acute and dangerous diseases. It calms the general irritation of the viscera; it fixes the oscillation of the nerves; it procures repose and comfort; it gives some tonic power to the alimentary channel; and, infine, it helps the dispersion of the yellow serum remaining in the cellular membranes.

A scrutinising perusal of the preceding case, will, perhaps, gentlemen, afford a better idea of my method of treatment of the yellow fever, than any treatise I could give. I shall, therefore, conclude this section with the following propositions.

1st. The pathology of the yellow fever suggests three indications to be observed in the method of treatment. The first is the speedy evacuation and renovation of the corrupted and acrid bile; the second, to counteract the progress of inflammation and to discuss the congestion of the large blood vessels, which cannot discharge into the liver; and the last, to assist the depuratory crisis of the whole system, which is to be effected within a certain space of time, and by natural or artificial means.

2^{dly}, The calomel is a specific of unexceptionable success, to evacuate the hepatic and cystic bile; provided its action be directed towards the

bowels, by being united with other draughts. As a siagogogue it may be favourable: and the mercury, applied externally, cannot be useful but in the last indication.

3dly, The first indication will be also successfully assisted by the use and action of an antimonial emetic; but, before this and the calomel could be efficaciously administered, the system must be brought to a considerable relaxation and temporary cessation of the inflammatory symptoms.

4thly, Profuse and repeated bleedings are the only sure means of abating the inflammation, and of fulfilling all the views of the second indication, which occur at the exacerbation of the fever. There may, however, be some advantage in sparing the blood; but, during the three first days, not to take enough of it would be fatal.

5thly, The last indication requires all the medical rules for the treatment of malignant fevers within a certain space of time; but the two first must be completely observed within three days; for, in the latter period, the contagious miasmata may already have contaminated all the animal fluids and mortified several viscera.

6thly and lastly, With the above indications, rules, and remedies, in conjunction with the following practical cautions, the treatment of the

yellow fever cannot fail of success, if the patient be free from previous complaints of diseased viscera or vitiated constitution.

SECTION IV.

Practical Cautions for the Treatment of the Yellow Fever.

OMNE NIMIUM NATURÆ INIMICUM.

Hip. *Aphor.* 51. *Seç.* 2.

THIS was one of the cautions laid down by the immortal father of the medical art, who was possessed of all the treasures both of judgment and experience. “*All that is to much is contrary to Nature;*” and even our important discoveries of a specific and of remedies for the yellow fever, will become dangerous if we administer them without proportion or restraint. I shall, therefore, gentlemen, proceed to consider a few important cautions in venesection and the use of mercury for the cure of the yellow fever, and then enumerate such other objects as relate merely to the patient.

It is a well authenticated fact, that frequent success has attended profuse blood letting in the yellow fever. If the injudicious and illiberal at-

tacks that have been levelled against it during our late calamity, have destroyed the confidence of some of the patients and their attendants, it has been owing to the force of ridicule which is too apt to seduce unreflecting minds. But time and experience lead to truth and will surmount every obstacle. When the celebrated Moliere had, by several dramatic pieces, painted the medical profession in the most ludicrous colours, the public laughed at the ignorance of pretended physicians. But the result was, that a more just discrimination was afterwards made between them and practitioners of genuine respectability. However, the public will doubtless readily acknowledge that facts and principles will always stand forth against every sarcastic assailant. To those who think that indiscriminate bloodletting was recommended as a specific in the yellow fever, we would remark, that the principles held out by physicians, ought always to be examined with impartiality and attention. We say, it is true, that, for the cure of the yellow fever, we must bleed early and as copiously as fifteen or twenty ounces at a time; that, in each exacerbation of fever, during the three first days, bleeding ought to be free in proportion to the apparent inflammatory symptoms or elevation of the pulse; that the stagnation of the bile in the liver and other viscera infarcted, suspending the circulation of the blood in the large vessels, ought partly to be

considered as an immediate cause of mortification, and partly requiring a great depletion of blood; that the power and efficacy of mercurial drastic doses, being always in a ratio to the relaxation of the system, it will be previously necessary to relax by bleeding, and this perhaps as often as they are administered; that the measure of bloodletting has no bounds but that of a visible and favourable change, and no terms to its reiteration, but the marked period where the effects of the malady are irrevocably fixed for death or recovery. After admitting these general rules, two cautions arise from pathological principles, viz. the time of bleeding and the quantity of blood to be taken. If venesection produces such powerful changes in the equilibrium of the animal fluids, and if it relaxes the solids, we ought not to have recourse to it, without a strict attention to the stage of the malady, to the exacerbation of the fever, and to the formation of certain crises. 1st, During the three first days of the fever, this remedy will doubtless answer all the aforesaid indications and purposes; but, when the effects of the contagion are diffused in the viscera and blood, as is generally the case after the third day, bloodletting may answer very well for certain secondary symptoms, but would then be useless for primary indications; and even if the patient was likely to recover, such means as have an enweakening tendency, would only retard

the favourable event. Hence arises the practical caution of sparing blood, if possible, after the third day. *2dly*, As the exacerbation of the fever exhibits all the extent and degrees of the inflammatory symptoms, it affords the best opportunity of judging of the necessary quantity of blood to be taken. At this period, also, the blood-vessels are infarcted or are in a state of congestion; while, at any other, nature seems to rest, and it is perhaps better to let her help the patient without disturbing the crises and operations of the fever. Hence arises the practical method of bleeding at the very moment of exacerbation; but seldom before and never immediately after. For, in the first case, we may retard it, when it is essentially necessary, and in the second, we invert its effects and render them incomplete. *3ly*, We have already noticed, that the admission of the bile into the blood, the hemorrhage, eruptions on the skin, &c. were crises of the disease, and that when one or many of them take place, the fate of the patient is decided. If he has not, however, been bled, before these symptoms take place, it is seldom in his favour; and if a case should happen, in which nature, without the assistance of bloodletting, should effect the resolution of the disease, it must be owing to the uncorrupted state of the whole mass of forces and fluids. If then, these happy effects can be ascribed to such a state, we must be careful not to

commit the issue of a recovery, or create irreparable accidents, by a diminution of these forces and fluids. Hence arises another practical caution of sparing the blood after the appearance of one or more of the crises. It would be very difficult and almost impossible to trace all those circumstances, which are to be discovered and determined by accurate attention and judgment. One instance, however, in the case of T. B. above related, may serve to illustrate the caution upon bloodletting. His situation seemed to require a third bleeding, and but little danger could have resulted from it. It will be remembered, that he had been copiously bled at first, while in the country, and that, deprived of any further advice, he remained without medical assistance till the latter end of the second day. At this time, he was in the most alarming situation, and I waited anxiously for the second exacerbation, which took place in the night, and indicated a second copious bleeding. Its effects were so favourable, and it produced so happy a change, that, at the time of the approach of the third exacerbation, I was convinced it would be regular, and not attended with too much inflammatory diathesis; for the patient had still continued to evacuate bile. I then left it entirely to the forces of nature. It was indeed violent; but its effects presented regular crises as far as medical rules designate. In fine, I concluded, that if this last

exacerbation could, without bleeding, be attended with many favourable symptoms, I might continue the treatment without using it any further. I afterwards received the greatest benefit from this reserve; for it rendered the convalescence of the patient very short. This generally is the case with those who lose but little blood*.
(Vide case 7.)

The exhibition of the calomel, in the yellow fever, will present to us more important and unobjectionable grounds of caution, when we retrace the different modes of the operation of this precious medicine, in order to confine its use to what absolutely requires it. We have seen that, as a drastic purge, it was particularly adapted to the excretion of the hepatic and cystic bile. To this striking circumstance, we cannot help ascribing the repeated success of those physicians who first recommended the use of this medicine. We are

* Mr. Licutaud, physician of the late king of France, has proved that profuse bleeding causes such a relaxation of all the blood vessels, as greatly to enlarge their capacities, which, by admitting more blood than is necessary, creates all the maladies incident to a plethoric state. It will, consequently, be of the utmost service to our patient to spare as much blood as possible. The mercurial drastics should be given immediately after bloodletting, as they will then produce a more efficacious effect; and, as the exacerbations after the third day till the end of the fever, are always decreasing, it must be concluded, that, admitting the remedy indispensable during the three first days, necessity will hardly be found for more than three or four venesections.

also acquainted with its effects as a sialogogue or salivating remedy; since many physicians have thought that this kind of operation could be produced by it only, and could be depended upon. In fine, the use of mercury, in the form of ointment, has been applied in many cases of the yellow fever, and I shall therefore, examine whether it will thus answer some useful purposes or not. From these preliminaries, gentlemen, I shall derive only one proposition, for practical caution respecting the use of mercury, including all my own rules.

The calomel, or mercurius dulcis, should never be administered as a salivating remedy in the yellow fever. It is sufficient to direct its action towards the bowels by the help of other powerful drastics. It will assist the crisis of the suppuration of the parotids if it can take place. The external application of mercury will not effect an evacuation of the bile, and could not answer but for the depuration of the system if the patient had not exacerbations of fever; but in this hypothesis the remedy must prove useless and dangerous.

Several important questions arise from the preceding proposition. What are the objections against the salivating method? Is the crisis of the swelling and suppuration of the parotids different from common salivation? Can it take place

in the yellow fever without the action of mercury? If it is a successful crisis, why do we avoid exciting it? And finally, if a mercurial preparation, taken internally, is allowed to be a good specific, why does another simple mercurial preparation, applied externally, prove useless or dangerous? Let us now resume each of these questions, and candidly investigate them, unattended with a lengthy and scientific collection of authorities, with which I suppose my medical reader well acquainted. In every kind of complaint there is not one of those revolutions or admirable crises in the frame, which are excited by the combined action of remedies, with a view of obtaining a cessation of the disorder, that is not an exact imitation of what the natural and spontaneous laws would accomplish, if they were not obstructed. The best, therefore, we can do is what nature frequently operates without our assistance, and often before it can even be obtained. Thus, among all the singular circumstances to be remarked at the end or resolution of malignant fevers, the swelling and suppuration of the glands and parotids has been noticed as one of the most favourable crises, and I have already observed that Fouppe Desportes, in his description of the malady of Siam, had particularly noticed its final and successful operation. To his authority I could subjoin that of many physiological writers. Experience also has exhibited to me several instan-

ces of the most perfect and successful suppuration of the parotids, in the yellow fever, without much mercury or none at all. (Vide cases No. 8 and 10.) I do not doubt, gentlemen, but to this crisis, which is not uncommon, we are indebted for the consistent and bold attempt of the physicians who first discovered the success of calomel in the yellow fever. They did not perhaps notice, that it cured by its drastic power, and that a succeeding suppuration of the parotids was rather a spontaneous crisis, than the effect of the remedy. But if this be so, there are others also which spontaneously prognosticate a perfect cure in all malignant fevers, as well as in our epidemic. These are yellowness, profuse evacuations from the bowels, hemorrhages, transfusion of corrupted blood from the lips*, &c. All these crises,

* This is one of the most singular crises I ever saw; and, as it occurs but seldom to practitioners, I think it deserves description. The subject was a poor man, of about thirty years of age. He was in the third day of his fever, entirely in the hands of nature, and destitute of any proper assistance. Although he was very ill, the usual medical assistance operated so favourably, that I desired he might not be sent to the hospital. On the fifth day, some blood ran from different parts of his lips; where it soon hardened and thickened so much, that he could hardly receive any thing into his mouth. The least motion or violence would cause a new hemorrhage. On the seventh day, the yellowness appeared much less than is common; but the size and weight of those black scabs were so great, that they reached the nostrils, and rendered the respiration very difficult. The patient was in the greatest torture, and made a hideous appearance. I ordered the lips

which are equally good when they take place at a proper time, appear various in different kinds of malignant fever. Thus, the yellowness is particularly characteristic of our fever, and the lymphatic swellings, in the same manner, designate the plague, &c. But, if in both diseases, the suppuration of the parotids could be excited, by art or nature, the one would not be attended with a jaundice, nor the other with a swelling; for there is never more than one crisis peculiarly spontaneous. The most convincing proof, however, that the suppuration of the parotids ought to be considered as a spontaneous crisis in this fever, may be derived from the observation which every practitioner must have made on the progress, stages, and space of time, through which a salivation is commonly artificially obtained. Few instances are found, even among delicate patients, in which it breaks out in less than eight days, and it generally takes two or three weeks. As much time is afterwards necessary to obtain, by it, a cessation of the existing symptom or disease. Now, it must be remembered, that five or six days only embrace all the periods and issue of the yellow fever. Consequently, if a suppuration of the parotids takes

to be washed with some warm mucilage. A few pieces of scab were soon detached, but new beds formed again though much thinner. They gradually diminished during the convalescence, which was otherwise rapid and regular.

place, it will rather be spontaneous, than be the result of a few doses of calomel; for the course of the disease is too rapid to depend upon its salivating effects. But if the crises of a swelling and suppuration of the parotids is to be considered as a spontaneous result, peculiar to one individual, and not to another; if it be a mere chance to receive it, as well as to be favoured with another as hemorrhage, flux of the bowels, &c. will it be prudent to administer the calomel as a salivary medicine only? Will not the safety of so rapid and violent a disorder be committed to an uncertain effect? And will not the treatment be rendered an obstacle to such means as nature employs to get rid of the imminent morbid cause?

To enforce this argument, we must examine what indications, facts, and theories, have united in support of calomel. This medicine has undoubtedly a peculiar efficacy in evacuating the bile, and in cleaning the infarcted liver; and I trust that no systematic practitioner will deny the truth of this fact. Why then do they prefer an uncertain operation to that which is as easily and as well produced in all subjects? Why would they endanger the issue of the malady, by fixing the whole effects of the mercury upon the primæ viæ, in order to confine its action on the salivary glands only, and thus render it useless in the evacuation of the *specific contagion*, at a time when

the most urging necessity calls for it? Why would they give time to the poisoned bile to injure its reservoirs, and then, by pouring into the blood, infect the whole system? Why would they believe that the evacuation of that *specific contagion* can be better effected by means of the salivary glands than by the natural excretory organs, as long as its sources in the viscera are not emptied? Such, however, would be the effects of adopting exclusively the idea of salivation by calomel for the cure of the yellow fever.

In dwelling a little longer, upon a subject of so much importance, I do not, gentlemen, fear to be tedious; and I trust I shall be excused when I attribute many unsuccessful instances of our treatment of the yellow fever, by calomel and bleeding, to the neglect of the considerations I shall now submit to your attention. I have already observed, that when the hepatic and cystic bile are evacuated, the system remained more or less infected; because the large blood vessels, which pour into the liver, and receive its blood again, must have washed off enough of the contagious bile. I also stated, that to repair such effects, a general depuratory crisis was afterwards to take place, within a certain space of time, and by natural or artificial means. As this physiological rule cannot be denied, it must be acknowledged, by every practitioner, that it would be

impossible, as well as improper, to excite, in every patient, the same final and depuratory crisis. They will remember, that, in a woman, it may, perhaps, take place by a discharge from the uterus, and in men, by perspiration, hemorrhages*, evacuations from the bowels, &c. The discovery of what will be the tendency of the patient, and by what crisis he will be finally assisted, remains consequently with us. When this is made, we shall be obliged again to acknowledge, that the calomel, when administered to salivate, will, in many cases, counteract the march of the disease; and that it will obstruct every crisis, but that of the mouth. A purge counteracts the fa-

* I remember seeing, during the late calamity, a publication in one of the newspapers of Philadelphia, in which the writer pretended to prove the necessity of bleeding in the yellow fever, by the frequent hemorrhages of the patient. I differ greatly from this opinion, and believe it might occasion considerable mistakes in practice. In the highest turgency of the blood-vessels, the small or capillary ones, have, according to their size, as much to resist as the largest, which are seldom known to burst, even when the pulse is in the highest state of elevation, except in cases of apoplexy, when the blood cannot return into the heart. Hemorrhages are always the effect of a lesion or of the morbid state of the texture of the vessels. In acute diseases, they originate from the vascular system; and they never happen during the exacerbations, but on the contrary during the remissions, and when the pulse has returned to its greatest calm. At this period, the relaxed vascular system, pours off a fluid ejected from the circulation, and not resumed in the veins. It is from this cause that hemorrhages in fevers are considered as ominous prognostics, according to the time of their appearance.

livation, while the latter has the same effect upon all that can be obtained by hemorrhages, perspirations, &c. It follows, therefore, that, if the patient has neither time or a natural tendency to undergo the operation of salivating, this means would be contrary to the cure of the yellow fever.

The practice of exciting a salivation, for the cure of several diseases, will better explain its equivocal effects in the yellow fever. By it, the morbid cause is transported from any part of the body or from the blood, into the salivary glands, from whence it is insensibly washed out, attended with a most offensive smell; and the mercury secretes, by these glands, a great quantity of saliva. Should others give a different explanation of this phenomenon, yet we must all agree as to the fact, and this is sufficient. It cannot be denied but that the affection of the mouth varies afterwards very much among different individuals, and although this circumstance cannot be accounted for, the results may be satisfactory and have the desired effect. There are patients on whom the greatest quantity of mercury has never been able to affect their mouths. Some receive an easy affection in the sublinguals and maxillary, but their spitting is unattended with a swelling of the parotids, and consequently has no critical good effect. The state of the teeth, their being covered with earthy scales, or much decayed, and previous mala-

dies of the gums, may, in many cases, render the action of the mercury so painful and even dangerous, by hemorrhages, that the course of the medicine must be interrupted, without fulfilling the adopted intention. In fine, the practice of administering mercury, without salivation, by the means of certain precautions, recommended by many physicians as equally successful and safer in the results, are considerations sufficiently powerful to make us disapprove of the salivating method in a disorder so rapid, and the malignancy of which, might be conquered by less equivocal means.

Resuming my former proposition, I recommend, as an important caution, that calomel should never be administered by itself nor in the method or proportions intended for salivation; that, on the contrary, it must be but about the third part of a drastic mixture, by the means of which it will immediately be diffused into the bowels; and that, if, in spite of jalap, scammonia, or gamboge, it is retained too long without operation, an oily cathartic, or some neutral salts, should be given to prevent the mercury from ascending, and to enforce the bilious evacuations, the importance of which has been sufficiently proved. This method leaves always time enough for the crisis of the month if it is necessarily intended by nature. It helps it sufficiently, and it

even accelerates its appearance, and gives it all the characters that can render it perfect and salutary. Such cases have occurred to me in the proportion of one out of ten*.

Few observations remain against the external application of mercurial ointment. Admitting that it tends to the purification of the blood, what will be thought if the original cause and the foam of contagion are not destroyed? The reservoirs of the bile are not emptied by mercurial *frictions*. This remedy, therefore, cannot answer any good purpose, except after the first period of the disease, when previous evacuations have been accomplished. This hypothesis, how-

* In practising the method of administering calomel, in the proportion of a third against two-thirds of other drastics, as jalap, scammonia, &c. the following has been the result of my practice in the worst cases.

Out of seven patients to whom the calomel was carefully administered as a drastic, I lost only one.

I had one spontaneous suppuration of the parotids out of ten.

One accidental affection of the mouth, with gentle spitting, unavoidably caused by the calomel, and without consequence, out of four.

One critical resolution by hemorrhage, out of three.

One by eruptions out of twenty.

And, finally, one by transfusion of the blood from the lips out of fifty.

ever, would still be liable to considerable objections, such as the exacerbations of the fever, and the turgency of the blood-vessels, which never fail to manifest themselves as soon as the mercury is admitted into the circulation. The first would be considerably counteracted by mercurial frictions, while they are necessary to terminate the malady within a certain space of time ; and the other would become precisely one of its most dangerous symptoms, and would be renewed and settled before we could have time to oppose it, or to obtain any decisive and good result. I saw, in the last prevalence of the fever, a robust young man, in the fourth day of his sickness, who had been regularly rubbed with mercurial ointment. The excretory evacuations had been neglected ; he had not the least affection of the mouth ; and he died on the fifth day.

Some practical cautions respecting emetics also demand our attention. I have already stated their usefulness in emptying the stomach and duodenum, when, in the course of the first period, these viscera are sickened, notwithstanding every other application has been successful. If the mercury, in short, promotes the secretion of the bile from the liver, this favourable operation is immediately followed by a sickness of the stomach, and then the emetic is necessary. (Vide case No. 7.) In many instances, the patients discover a great

aversion to this remedy, and if they are of a delicate nervous constitution they frequently refuse to take it. In such cases I employ an equivalent remedy, strongly recommended by the ingenious Mr. Dubois de Rochefort, in his *Materia Medica*. He calls it *un emetique cathartique en lavage*. One grain of tartar emetic, or one grain and an half at most, is to be dissolved, with half an ounce, or three drams, of salt of Glaubert, in about two pounds of water. The patient is to drink it by tumblers full every hour. This medicine is not nauseous; it seldom excites vomiting; and it is always sure to empty the stomach and bowels downwards. It is a general observation in practice, that the patient should, in all acute disorders, be prepared, by various depleting remedies, for all the subsequent operations. But we must cautiously avoid giving of pukes in the beginning of the yellow fever, and particularly so if a profuse bleeding has not immediately preceded it. Indeed, the turgency of the arterial system is then so great, that the convulsions of the stomach may have dreadful consequences. I have frequently seen them followed with such fatal accidents, that I think it my duty to mention the necessity of a cautious reserve*.

* It is a general custom among practitioners, to prescribe blisters in desperate cases, and I have often been strongly importuned to administer them, by the nurses and friends of the patients, whose hopes of their efficacy are sincere, but who are unacquain-

Admitting the above practical cautions to be adopted by those physicians, who, with great propriety, have chosen calomel and bleeding for the cure of the yellow fever, still, gentlemen, if the patient labours under the complaints of diseased viscera and vitiated constitution, or if he has not made timely application for medical assistance, they are not sufficient. Under this two-fold consideration, every impartial judge will make due allowances for the medical art in unfortunate cases of death. It is too true, that, during the prevalence of a dreadful and contagious epidemic, confusion and despair, seclusion from intercourse, and erroneous opinions on the first symptoms of complaint, expose the patient to diffident delays and improper measures; but experience and the warnings of physicians, ought to teach our fellow citizens the importance of an early application to medical aid, in the cure of one of the most malignant disorders that ever was known among nations. In cases where the disease would have gone through its periods in the

ted with their real consequences. I shall not here enquire into the nature and extent of their utility, nor the method of their application. After referring to all that has been discovered and adopted in the treatment of the yellow fever, it must be allowed that they are absolutely useless, and cannot answer the least purpose in any period of the disorder. As, therefore, there are such numerous distressing circumstances attending an unfortunate issue of the treatment of the yellow fever, humanity requires us to exclude this excruciating application.

short space of three days, one day lost proved fatal. Those also, in whom the malady was of longer continuance, and who remained unassisted during the first days, found, alas! a similar fate. Let no one, therefore, for his own sake, be careless about any slight instance of complaint which he may experience during the prevalence of an epidemic; for, although various degrees of bilious or other complaints may appear, and though their mildness may have nothing common with the rapid and malignant effects of the former, yet, at the first call, the physician himself feels obliged to employ all the energy of his practice, notwithstanding he sees but partial and suspicious symptoms. His severity of judgment and prescription, will not be attended with dangerous consequences; but will happily prepare the proper treatment for any unexpected malignant case.

In order to illustrate the importance of an early application to physicians, during the season which unfortunately creates all degrees of bilious, remittent, and malignant fevers in these climates, I shall familiarly relate an instructive instance of errors of judgment, in a case of apparently common and trifling indisposition, and of the inutility of medical aid when applied for too late. Towards the close of our late calamity, I was sent for by the wife of an unfortunate husband.

From motives of the most unequivocal tenderness and affection, she unhappily deprived him of such timely aid as would undoubtedly have saved his life. "During four nights she had not left his bedside. Persuaded that she knew, by experience, his indisposition, she continued all this time to give him such remedies as she thought proper. She refused at first to admit me into his room ; for the frequent visits of physicians to infected houses alarmed her very much. She said that she had been so secluded from any kind of intercourse with others, that, thank God, the yellow fever had spared every one of her family. She observed, that she had called me for some advice respecting the indisposition of her dear husband ; but she was happy to think, that there would not be much occasion for medical aid ; for, since she had sent her message, he appeared to be on the point of recovery. He was up, walking about the room ; and he intended, next day, to ride out to the country." This last circumstance, struck me with the apprehension that this was the last day of the life of the patient ; and, that I might be better able to judge, I requested her to give me an account of his indisposition from the beginning. " He was taken, she replied, with a slight fever and puking, owing to a little intemperance on the preceding day ; and his head ache and pain in the limbs, she knew very well, proceeded from a violent cold, which she always cured with sweat-

ing teas. She had afterwards given him a few pills, which operated faithfully, and the pains and fever happily subsided. The patient had, last night, puked something of a black colour; but she did not wonder at it, as she had previously complied with his wish of giving him some coffee and toasted bread. He now felt very easy, though a little weak, which was of course; and she could not expect him to be better. In short, she had attended and nursed so many sick, among friends and relations, that she was sufficiently acquainted with the necessary management and cautions! !” I cannot tell, after such a recital, which struck me most, the innocent confidence of the wife, her unsuspecting ignorance, the irrevocable fate of her husband, or the painful task which devolved upon me, of destroying so many erroneous opinions, and plunging, by one word, the whole family in the most unexpected distress. My silence was interrupted by the patient, who called us up, expressing some uneasiness and wishing to lie down again. His pulse was small, tense, and intermittent; and a black instead of a yellow hue was suffused all over his body. The confusion of his look, was highly expressive of instant danger; and being suddenly taken with the most extreme weakness, he could hardly answer to but few of my questions. His wife was now seized with astonishment; and, taking advantage of the circumstances of the moment, I retired with her from

the presence of an object who was every moment becoming a more deplorable proof of her blinded confidence—a victim of a culpable security—an object whom she saw no more! But if this singular case, the error of which cannot be ascribed to neglect, may appear rare; yet how many others have I seen, and how many deaths may be attributed to parsimony, indifference, and the want of timely medical assistance!

The last subject of practical caution, gentlemen, that has occurred to me in the treatment of the yellow fever, is still more serious than the preceding ones, and of more certain fatal consequences. In other acute disorders, a physician may perhaps find out some means of relief, and calculate by them a successful mode of treatment, notwithstanding the patient may labour under previous complaints of diseased viscera or injured constitution; but in our epidemic there is no such prospect, or at least it is very faint. During the two periods of its prevalence, I never met with an instance of recovery from it, when the whole frame had been materially injured by certain causes. A pulmonic affection, however, when not too far advanced, would not, I believe, readily present an obstacle to the cure, as I have once seen exemplified; because the proximate cause of our fever lies entirely in the bile and alimentary channel. But I shall always despair, at the first

view, of those who have considerable obstructions or congestions in the liver, or who have unfortunately kept in their constitution any scorbutic taint or remains of syphilitic contagion. On the dreadful effects of this last, in the malignant yellow fever, I shall present you a few important reflexions ; and that they may be carefully contemplated by my young readers, is the philanthropic wish dictated by too many fatal instances. It has been evidently remarked, that the epidemic acted most severely upon young and robust men, and that its victims were chiefly of that description. This is a positive fact, the elucidation of which will not appear strange, when it is remembered that it is not easy to get rid of the poison received in the embraces of prostitution ; that many methods for its cure are truly deceiving ; that some noble viscera may, by it, remain essentially diseased ; and that the blood, which contains its particles, will be sooner and unavoidably contaminated by another contagion. The most favourable symptoms do not always justify the confidence either of the patient or physician ; for we are unacquainted with all the changes and shapes of a malady which has been justly termed a Proteus or a Cameleon*. We are daily taught by experience, that, by the cessation of one of its symptoms, we are not to judge of a perfect cure. It

* Vide Astruc on venereal diseases.

deceives us and the patient also; for it often lurks within the body, without diffusing into the blood, or producing any mark of infection. Since there are external swellings and various sorts of tumours which we attribute to the venereal lues, why should we doubt but that they may exist internally, or within some noble glands? How often, indeed, the prostate gland remains ulcerated, swelled, and tumefied with exuberances, after the improper cure of a gonorrhoea, by strong astringents, I leave those to determine, who are acquainted with the precious enquiries of two famous surgeons on that subject, Petit of France, and Hunter of England. In these cases it is very easy to appreciate, without further explanation, what will be the effects on the secretions of the urine, on the functions of the kidneys, and on the bowels. To such internal and chronic causes, we must ascribe the numerous obstinate and long complaints, which baffle medical skill until their primitive cause is cured. Mania, hypochondria, epilepsy, and the long list of nervous complaints, may originate from the simple irregularity of secretion of urine into the kidneys; for a part of that fluid remaining in the blood, must afterwards affect the whole, or at least a part of the frame. But such circumstances have a decided effect in acute, malignant, and contagious fevers. The violence of the first symptoms is an additional evil to the enweakened viscera; for

by it they are immediately brought to the brink of destruction. The struggles, the exertions, and the efforts of nature, are then soon exhausted; and if there is a scale of the natural degrees of health, of those which may be depended on above it, and of those under which the phenomena of life ceases, what proportion remains for medical expectation and skill, when such complicated causes absorb the whole balance of what is termed excitability by one, and what is thought to be the whole extent of natural laws by another? Were it not a point of delicacy, gentlemen, for a practitioner to produce reflections on complaints, that, according to the opinion of many, would blemish the memory of the dead, I would support this discussion with the evidences of many cases. May those who are apprised that youth and robust constitution have been so cruelly exposed to the deadly blows of the malignant scourge, beware of the enticements of prostitution, and oppose them by the dictates of reason, religion, decency, and self-preservation.

CONCLUSIVE REFLEXIONS.

1st, When the congestion of the blood in the large vessels is diminished, and when the critical evacuations of the hepatic and cystic

bile are obtained, bleeding is no longer requisite during the subsequent days of the fever; and this is a caution for the success of the final crises and of the convalescence. Under a general rule, which physicians only can determine, it may be observed, that venesection is to be copiously applied, during the three first days, at each exacerbation, and fifteen or twenty ounces at a time for adults.

2dly, Salivation attended with a suppuration of the parotids is not to be proposed exclusively of other crises. If it takes place spontaneously, it becomes salutary. The effect of mercurial drastics in the bowels is to be unremittingly pursued; but the external application of mercury is useless and dangerous.

3dly, The antimonial emetics and the cathartico-emetic answer the most direct intentions, provided the turgency of the blood vessels has abated.

4thly, Previous complaints in the liver, in the bladder, in the urinary passage, &c. ; and scorbutic and venereal affections, are unexceptionable obstacles to the cure of the yellow fever.

SECTION V.

General Means to prevent the Generation and Introduction of the Yellow Fever.

Two contrary opinions have appeared on the origin of the yellow fever, and have been officially transmitted to the executive, by medical bodies of Philadelphia. An attentive public, who know that truth cannot be contradictory, must doubtless feel deeply concerned; and will regret that, after repeated calamities, no unanimous improvement should be made among the learned on so interesting a subject. Under these circumstances it becomes necessary, that, while measures are adopting to prevent its importation, the probability of its domestic generation should not be forgotten. The public precautions should not be founded solely on the particular opinions of either party; and experience may hereafter afford us sufficient and such unexceptionable proof, as will leave room but for one opinion upon the subject. I do not, therefore, gentlemen, disapprove of any measures that may be adopted to prevent the importation of the yellow fever; on the contrary you will discover that the above theory has a sensible advantage over the latter,

for it also admits of all the necessary precautions against the effects of noxious exhalations from the holds of ships or vessels arriving from tropical countries in the hot season of the year. If we do not implicitly believe that this contagious epidemic is imported from one country to another, like the plague or the leprosy, still we admit that it may possibly originate on board of ships during a long passage, which contain animal or vegetable substances in a state of fermentation; that, raging contagiously among crews from tropical islands, when the remains of them come to mix with our citizens, it may spread its infection among them, and chiefly during the hot season of the year; and that, in fine, when a contagious distemper is known to rage in any part of the world, our intercourse with it should be cautious and subject to lawful controul. Thus far, therefore, we coincide in the measures of the implicit believers of local importation. We desire, however, above every thing they have as yet suggested, to fix the observation of our fellow citizens on the domestic sources of contagion to which they are exposed. These are self-evident, and demand our most pointed attention. Why then are we taught to look upon them with indifference, and to confine our researches exclusively to the ships and men that arrive in our harbours, from distant countries, which at least have been considerably purified by the tempestuous winds of the seas?

In order to proceed regularly from the propositions I have above stated, I deduce the following means to prevent the introduction and generation of the yellow fever. "I have already proved, 1st. that it was generated by putrid effluvia from vegetable and animal fermentation; and 2^{dly}, that the opinion of its importation could not be admitted exclusively to its spontaneous generation, in every warm country, from the above-mentioned causes." It of course follows, that to oppose the possibility of its importation, and of its breaking from corrupted cargoes, it would be expedient to remove such ships from our shores as are loaded with colonial produce, at least during the months of June, July, August, September, and October. The rule for admitting these articles should be defined according to their good or corrupted state, a few days after the ships have been unloaded. No intercourse with their crews should be permitted during five days after. But if a vessel is supposed to contain corrupted miasmata, and authenticated cases of any kind of bilious fever should be found on board, the sick ought to be removed to a distant hospital, and the ship and company perform a quarantine of ten days.

As the outlines of the report of the committee of the legislature of this state, during the present session, are chiefly founded on the belief of the

foreign origin of the yellow fever, there is no doubt but such efficacious measures will be adopted as will prevent the dangerous effects of corrupted cargoes and waters in the holds of shipping. I shall, therefore, confine my observations to an examination of the means which experience will hereafter dictate to be exclusively adopted against more threatening causes of contagion.

Philadelphia, situated on the west bank of the Delaware, and on the narrowest space between the Schuylkill and that river, may be wholly designated in the form of a parallelogram, the squares of which are intersected by wide cross-streets, which raise very little, in certain points, from the south to the north, but which are open to all the winds, and to all the emanations of the surrounding fields, ponds, marshes, and swamps. The conveniencies of footways, their cleanliness, and the uniform practice of the inhabitants in frequently washing the outside of their houses, give to the city a singular appearance of regularity and neatness highly admired by foreigners. It contains, however, some capital defects; and too many unfavourable circumstances concur to injure its salubrity. Water-street, thirty feet wide, extending from the northern liberties to Pine-street, parallel with the course of the Delaware, is in a confined low situation. Through the whole of its extent, it has but few vacancies, is com-

paſtly built, very diſagreeable, and is totally deprived of back yards on the ſide of Front-ſtreet. The ſame is to be obſerved with reſpect to Penn-ſtreet. It likewiſe runs along the river from Pine to Cedar-ſtreet; and, in the late caſes of epidemic, both have been particularly marked as the firſt ſeat of the diſeaſe. The main height of the ground on which the city ſtands, is nearly forty feet above the Delaware. Many ſtreets are, however, lower; and, conſequently, the adjacent ground, intended for the continuation of the original plan, is in many places marſhy. Some parts of it contain large and deep ponds; and theſe ſtagnant waters are to be ſeen, more or leſs, in almoſt all the points of the circumference of the city.

The general convenience of ſhipping, to which Philadelphia is indebted for her rapid increaſe of wealth and population, has rendered her wharves neceſſary. They are compoſed of made ground, formed by the means of log caſements filled with earth and ſtones; and they extend along the front of the city and ſuburbs to the diſtance of about two miles. As I ſhall, in the courſe of my obſervations, avert more particularly to this circumſtance, I ſhall now obſerve that they are elevated above the higheſt tides, ſo that, at low water, their vertical ſides are expoſed, for near five feet, to the rays of the ſun. In the Northern Liberties and the diſtrict of Southwark, there are many

vacancies on the banks of the river. Owing to the periodical floods, these form large miry grounds, which are never dry, but covered either with thick beds of filth from the adjoining streets or habitations, or with rubbish, old timber, &c. These sources of exhalation are not of the most indifferent consequence.

Our city is supplied with no running waters or fountains, and but few cisterns are to be found in private houses. Wells only are dug, in distributive number, in different parts of the city and suburbs. A pump is placed in each well, and water is thus easily obtained for all the wants of life. A gutter, formed by the elevation of the foot way, and by the gradual descent of the street to each side, seems sufficient to receive and carry down the dropping waters. The declivity of the street, in some places, however, is worn down; and the waters stagnate, more or less, in all the gutters. During the heat of summer, they receive the filth from the houses, and become very noxious for want of being drained, and more especially so, since they are daily renewed by the pumps. The inhabitants seem generally indifferent about these waters, because they do not see but small ponds of black and green water; but, as they are repeated, I am persuaded that they add much to the quantity of putrid and unwholesome exhalations.

There are twenty-eight houses for public worship in Philadelphia, and I believe as many grave-yards within the city and suburbs. It seems yet to be questioned whether they are really of a noxious nature or not. It is said that, as the graves are usually dug to the depth of six feet, the health of the citizens cannot be injured by them. Even admitting this observation to be true, yet, if dangerous vapours cannot immediately rise from the grave-yards, by the effect of the heat, they may otherwise be disengaged, by the hydraulick laws of subterraneous waters. For, supposing a grave-yard in a very elevated part of the city, as that of the Friends, at the corner of Arch and Fourth-streets, which is besides near five feet above the street, within a stony enclosure, it will be granted that the dead are on a level with many different parts of the city, and in some cases even above it. Now, since it is acknowledged that the greatest elevation of the city from the river is forty feet, and that many of the grave-yards are on the highest grounds, it will evidently appear, that the inhabitants living in a lower part of the city, will receive exhalations from the earth, of moisture and waters that have been infiltrated through an elliptic plan and through a vast number of dead bodies. This observation will be found to agree with the hydraulick laws; for, according to them, in saturated grounds, evaporation collects the waters by

infiltration from higher surrounding points, in the same manner, that, to obtain water from the the highest parts, we dig for its evacuation at the lower ones. This explanation, gentlemen, will shew how the evaporations in most of the low parts of our city, are rendered noxious by the putrefaction of thousands of dead bodies, and may be carried from one point to another, by means of the grave-yards being intermixed with our dwellings, besides their immediate effect in altering the waters collected in our wells.

Lastly, we have a more dangerous source of putrid animal exhalations, which is more sensibly discovered in thickly inhabited places after the heat, and at the close of summer.

Each dwelling has a privy-house, situated at the farthest end of the yard; and the houses on the east side of Front-street have them in their cellars. The ditches upon which they stand, are dug to a considerable depth and built round with stones or bricks. Many of them are twenty feet deep, but this circumstance removes still further the idea of cleaning them. After many years the fermentation causes offensive vapours during the summer; and it is very seldom the case that the ditches are cleaned more than once in ten years, when it is of-

ten considered easier to fill them with stones, and to dig others. The fact is, gentlemen, that towards the end of the summer, that is to say, after the action of the heat has sufficiently excited fermentation, mephitic gas ascends from the ditch. Our inhabitants are so well apprised of this, that they always provide their little-houses with a vent hole. This is a proof that the depth of the ditch is not a preservative against its noxious vapours; for the rarefaction and the heat of our atmosphere could raise them from a much more distant centre. The absorption of the within contained fluids is so slow, in moist and impregnated grounds, that they wholly remain and serve to accumulate the mass of fermentating animal substances. If a lighted candle be lowered into one of these ditches, by means of a line, it will often be put out; and when the temperature of autumn does not oppose the dilation of the ascending gas, it is plentifully diffused round the houses, yards, and alleys, where it is often sensibly smelt, chiefly when the air is calm and sultry.

After the enumeration of so many causes and dangerous sources of putrid exhalation, will not our minds, gentlemen, be impressed with the reflection of Dr. Lind, that, "next to infection, the most frequent cause of fevers

is perhaps the offensive and polluted air in unhealthy places ;” and that our calamity, periodically breaking out, at a certain season of the year, was not merely imported ?

There are, in Philadelphia, many other sources of putrid effluvia*, which perhaps are

* There are several sinks in Philadelphia, to receive the waters from the gutters, at those points where a declivity can no longer be given to their beds. Two very remarkable ones at the corners of High and Fourth-streets, were, during last summer and fall, productive of the most offensive exhalations and became a mere nuisance. It is very probable, that, by some defect or other, the waters in them were obstructed; and I take the liberty to direct my request to the proper authorities, to have these sinks examined and repaired. As many cats were starved, in consequence of the desertion of the city, there was, I am persuaded, a quantity of carrion in them. Called out frequently during the night, I could strongly perceive the smell as far as Arch-street on one side, and Chestnut on the other. I employed some hours in following the current of exhalation, and was at last satisfied as to its true origin.

There were also several sinks in Pear-street, in Chestnut-street, at the corner of Dock and Walnut-streets, and in other parts, the canals of which have been, I believe, destroyed, but the holes left open, and the people of the neighbouring houses still continue to throw their filth in them. I have been informed, by a very respectable citizen, that he observed, during the two instances of our calamity, that these vent-holes of putrefaction had been productive of a great number of deaths in their neighbourhoods.

unavoidable, and are common to all other thickly inhabited places in the world, but which ought to attract the attention of our public authorities; since they are much more dangerous in a place exposed to the heat of the tropical countries. For these, as well as for the preceding observations, I hardly think it necessary, gentlemen, to dwell much upon the direct measures that should be adopted by the citizens at large, against the different causes of our epidemic. If they were not kept in a state of incertitude, with respect to its real origin, their wisdom and prudence would enable them to make the proper regulations. But alas! those who are induced, after sufficient contemplation, to predict that the fever will frequently rage again in Philadelphia, know how many opponents there are to this melancholy truth, and have very little hopes of obtaining a majority in favour of their advices. Yet, if I cannot flatter myself with gaining many proselytes to my opinion, I consider it as a duty and a pleasure to throw my mite of information and firm belief, into the fluctuating scale of public opinion. Under the influence of this sentiment, I assert, that the only sure and efficacious means of preserving Philadelphia from contagious malignant fevers, will be those that are directly calculated to remove or destroy,

if possible, the sources of putrid exhalation from animal and vegetable substances that are contained within our precincts. These means, gentlemen, are of such a magnitude, that, neither time or great expence would be able to effect them, if religious prejudices, views of mercantile interest, and opinions of party spirit, are suffered to thwart their execution. Before I attempt to enumerate them permit me to make a few reflexions more on the chymical principles and results of putrid exhalations.

First, In whatever light we consider the component parts of vapours and gasses, either according to the former or new nomenclature of chymistry, this much will be acknowledged, that life is opposed to the putrid fermentation of animal or vegetable substances; and that, as soon as they are deprived of it, they necessarily fall into a complete state of putrefaction, which is more or less accelerated, according to the quantity of heat or caloric, of air and of water, in which they are immersed.

2dly, As soon as the putrid fermentation takes place, a new combination arises of several substances, which have a peculiar tendency to unite to the air by the help of the heat, or

to the water by their affinity to them ; so that both fluids, being considerably altered in their nature, will present a quite contrary effect to that they would have exhibited at first, viz. the very air which was good for life and health, will produce a quite contrary effect, &c.

3dly, Among the different qualities of the substances disengaged from animal fermentation, there are two very remarkable and which constitute all the degrees of noxious exhalations. The first is their extreme tendency to unite with air and water, (*Vide Diction. de Chimie, par Macquer, art. GAS*) ; and the other is a certain degree of their developement, which is impossible to account for, in which whether in a fluid or solid state, their immediate contact with any living body, suddenly destroys or suspends the phenomenon of life. A traveller found the body of a drowned man that had been washed on the shore by the flood. As he perceived no fœtor, in examining the corpse, he inadvertantly plunged his finger into a soft and putrified limb. From the finger the mortification was so rapid to the vitals, that he had no time to be assisted, and he died. Anatomical dissection has also proved the truth of this terrible and dangerous state of putrefaction. Its various degrees must undoubt-

edly breed different kinds of disease and contagion.

4thly, These exhalations are, moreover, subject to other laws and phenomena of nature, which sometimes occasion them to be harmless when they are most dreaded, or very noxious and fatal while they are not perceived or even thought of. Heat, without aqueous particles, raises them, and winds carry them through immense regions. They seem visibly to be a kind of meteor; their operation on the body is terrible, and they in some measure destroy the vitals without any contagious or poisonous effect. Such are those remarkable winds and vapours, so well known in the deserts of Africa, and which originate in the mountains of Abyssinia*. Heat, also, may dilate them to such a degree that they become harmless. This is the case when it puts an end to the plague in the hottest countries of the earth. Aqueous vapours, without much heat, can disengage but little of these exhalations, and it is then very common to perceive much fætor, without receiving any injury from it. Thus people attending the sick, dissecting of dead bodies, butchers, tanners, and all those who are frequently among exhalations from animal

* Vide Bruce's Travels through Abyssinia,

fermentation, are not known to be injured at all. Those exhalations which are suspended above a corpse, within a metallic or wooden coffin, do not want much heat or moisture, to become fatal as soon as broken open. A mephitic gas then appears similar to that which we discover in our chymical experiments. Its effects are sudden against every living body ; but it can be almost destroyed or rendered harmless, by aqueous vapours, and may be totally absorbed by vegetables. This air or exhalation occasioned the death of many citizens of Paris, who, in the month of August, 1792, were instantly killed by its contact, while they were breaking the tombs, to take away the leaden coffins, for materials of military ammunition.

5thly, Fevers produced by exhalations are remarkably various, according to their places, time, and season. What a striking difference was there between the elephantiasis of Athens, the plague of Marseilles, the fore-throat of Italy, and the sweating sickness of England? We could hardly find, in the present day, any pathological similarity among the dreadful epidemics of Norway and Holland ; the anomolous malignant observed by Hoffman in Germany, during the years 1727, 1728, and 1729 ; the in-

termittent ague of marshy places ; the camp diarrhoeas ; the hospital contagious petechiæ ; the convulsive malignant related by Dr. Chisholm, which he thought had been imported from Guinea into the West-Indies ; the *vomito petro* of the Spaniards in Vera Cruz ; and the yellow fever of the tropical countries, &c.

6thly and lastly, The concurrence of rains, storms, and heat, are necessary to develop noxious exhalations from vegetable and animal fermentation. The conjectures resulting from attentive observations are, that intense heat, without wind, after heavy rains and southerly storms, is most productive of noxious exhalations in places containing materials for vegetable and animal fermentation.

These elementary laws, respecting the nature and effects of exhalations, I have, gentlemen, endeavoured to present, unaccompanied with any scientific method, in order that every description of my readers might become better acquainted with them, and finally apply the following means as the only preventives against the generation of the yellow fever * :—

* The committee of the house of representatives of this state, on the health laws, have, in their report, expressed themselves in the following terms.

GENERAL MEANS.

ist, The removal of all grave-yards to many miles distant from the city and suburbs.

“ Although your committee are decidedly of opinion, after the most attentive investigation, that the disease which ravaged this city and its suburbs, in the year 1793, and the late autumn, was of foreign origin, they nevertheless believe that there existed at those periods a certain condition of the atmosphere which favoured its propagation, and without which it could not have been transmitted to any alarming extent. It being a desideratum, that such a state of air should be counteracted, which affords nourishment to contagion, they cannot too strongly inculcate the necessity of a supply of pure water to the city, and of the strictest attention to such regulations as will keep it and its environs free from putrefactive substances.”

I am happy to think that the above *certain condition* of the atmosphere, to which the alarming extent of our disease has been ascribed, and which has not been explained by the reporters, may be fully understood, by the means of elementary chymical observation; and those who are decidedly of opinion, that the yellow fever is of foreign origin, should not forget that, in this age, there is no certain noxious condition of the atmosphere, but has been submitted to the most *attentive chymical investigation and analysis*. This much, however, may be asserted, that the desideratum to counteract an unhealthy state of the air, by rendering it free from putrefaction, perfectly coincides with our theory, observations, and general proposed means of preventing the generation of the yellow fever.

2dly, The speedy accomplishment of the advice of Dr. Franklin, to obtain fresh and running waters in the main parts of the city ; and a police law enacted, ordering all the gutters to be washed once a week, during four months of the hot season.

3dly, Stone wharves ; and their owners obliged to cover them once a year with a coat of tar. The vacancies on the banks of the river, within the city and suburbs, to be overspread with a bed of gravel.

4thly, A police law for the clearing of privy ditches, once every winter, and obliging the owners to throw in so many bushels of lime, according to their diameter, in the beginning of the summer.

5thly, Gutters, sinks, cellars, market-stalls, tanner's and butcher's yards, to be ordered under the inspection of commissioners and physicians, during the six months of summer and autumn.

6thly, Vessels from the West-India islands, and other tropical countries, subject to an inspection of their cargoes and holds ; unloaded at a distance from the city ; kept with their crews, under a quarantine of five days,

during the four months of June, July, August, and September, and a longer time according to the wholesomeness of the ships and health of the men.

SECTION VI.

Particular Preventives against the Yellow Fever.

THIS section, gentlemen, I would consider as the least useful of my essay, if any of my readers expected to find in it secret receipts or infallible remedies, and if they believed that I thought my advices, joined to those of the most eminent physicians, sufficient to render them invulnerable to one of the most rapid and ferocious disorders. Where is the art that can indubitably face danger, can always elude its strokes, or resist its efforts, whether in battles or in any kind of human infirmities? Alas! when the best preventives have been made use of, and the mode of living rendered scrupulously cautious, still there are many chances of infection against one of preservation; because the attendants of the sick, as well as those citizens who are detained in town by the necessary pur-

suits of business, are exposed to the fatigue, the anxiety of mind, and all the other inconveniences attending a general calamity, and, under such circumstances, it is not always in human power, totally to avoid the means of infection. Thus we have seen many of our physicians, who, during the late calamity, were among the foremost in attending on the sick, become the victims of its ravages! Their names and memories deserve the tribute of honour and of gratitude*. To us, gentlemen, they have given a noble example. Let us then shed a tear upon their tombs; and, like them, pledge ourselves as the friends of humanity.

Physicians and others who first suspected the domestic origin of our fever, advised their fellow citizens to remove to the country. However efficacious this measure was to those who

* The following are the names of the physicians, who, in discharging their professional duties, fell victims to the yellow fever.

Doctors WAY,
 THOMPSON,
 JONES,
 PLEASANTS,
 DOBELL,
 ANAN,
 HUNT, and
 CLARKE, lately from Ireland.

could afford the expences attending it, what distress did it not produce among the labouring class of our citizens, to the public functionaries, and to those whom public or private concerns retained at the theatre of the calamity! By desertion, indeed, the last prevalence was rendered more afflictive than that of 1793, although it was not so extensive in its ravages; and it will always be my wish, that, during such a period, we may experience less of that ruinous and unexpected dispersion of our citizens. When this is the case, there is no kind of distress to which our patients are not exposed. Instances, likewise, were known of malignant cases and of deaths among the fugitives. A mortal infection was thus propagated in several surrounding country places, for how could they escape the necessary communications and intercourse? In European places exposed to pestilential diseases, it is a supreme law, that, during their prevalence, the inhabitants are not suffered to quit their places of abode. Far be it from me to wish for such an inhospitable measure. It is only mentioned to suggest, that it is a question whether more good than evil would not arise to the community at large, if, free from terror, assisted by proper and efficacious measures, encouraged by numerous instances of preserva-

tion in town and recovery among the patients, they could be persuaded to see the short period of an epidemic spent, unaccompanied with the tenfold calamities and misfortunes of desertion.

However rapid the effects of an existing contagion may be upon healthy people, we can derive from our stated principles, three powerful motives of confidence and security. The first results from the nature and operation of the contagion on the bile only; the second, from the possible removal of the sick from numerous families, or an absolute cessation of intercourse with them; and the last from efficaciously experienced cautions even in cases of the nearest danger.

I. The yellow fever, we have already said, is merely a bilious one of the most malignant degree. Its operations and symptoms are wholly upon and from the bile. Our inhabitants are particularly subject to bilious complaints in a certain season of the year, and when the last are endemics, the former will turn out to be an epidemic of the severest kind.

We have seen also that bilious and yellow fevers commonly fell upon those in whom the

bile was of a thick or vitiated nature, and who, by habitual neglect, intemperance, or other unhealthy mode of living, exposed that secretion to a state of stagnancy and corruption. Such simple and reasonable given observations should help us to fix upon a successful method of diet, of remedies, and of cautions, during the perilous prevalence of the yellow fever. At such a period, a vegetable diet will be a sure preventive against animal corruption; and animal food of the lightest kind, being always sufficient for necessary nutriment, if preferred to heavy and gross meats, will not excite so great a fermentation of the animal fluids. Simple tonic drinks, measured according to the wanted digestive power, will preserve us from those inflammatory and heated motions of circulation which always attend the face and feelings of drinkers of strong wines and spiritous liquors, which is an obstacle to the formation and secretion of liquid and pure bile. But it may be said, that such a plan of diet would not be sufficient, during the exhausting heat of the weather and the necessary fatigues of life, and particularly so at a time when the body seems to want more stimulating means to raise the lowness of our strength and spirits. This, gentlemen, is true, and this feeling is powerful; but we ought not to suffer our ha-

bits or misinformation, to make us mistake the proper means. I have been frequently more animated and refreshed by a warm bath, during the heat of summer, by an airing in the country, or by a cooling medicine, than I could possibly be by the most succulent cordial. In fact, we may compare our body, charged with so many springy actions, to a bow, the elastic power of which would be lost if it was stiffened by the effect of a drying fire, but which would be better preserved if kept in a soft and moist temperature. Besides, when we feel very weak, it is often because the *vis vitæ*, elevated to an uncommon degree above the point of health, approaches to its end, the same as when it is too low; and then relaxing means are proper, salutary, and successful. It is observed that we never more frequently experience the effects of weakness, brought on by the heat of our fluids, than in the summer. At this season, we are peculiarly exposed to obstructions in the alimentary channel, crudities of the stomach, and cessations of daily evacuations. This last effect is unavoidable, even among the most regular constitutions; but evacuating medicines oppose to it an infallible power. A puke or a drastic never fails in removing those crudities or obstructions; and, if they are mercurial or antimonial, they will more properly discuss

the reservoirs of the bile, and renew that animal fluid, the fermentation of which becomes so dangerous. I had frequent opportunities, during the two prevalences of the yellow fever, to give this advice to people, who appeared to enjoy a regular degree of health. A slight indisposition, which could hardly call for their attention, at another time, was then a sufficient motive for applying to cautious measures. I never hesitated, when the subject could bear it, to prescribe a puke at first, and a mercurial drastic after. In this manner, and with much surprize, I timely delivered many of them of a prodigious quantity of unnatural, black corrupted bile, from which a dangerous fit of sickness would undoubtedly have originated. (Vide case No. II.) Yet they afterwards lived healthy, notwithstanding the heat of the season and the prevalence of the contagion. It is, in fine, a necessary caution, repeatedly to have recourse to such medical assistance; for it is acknowledged, both by physicians and others, that repeated cases of infection may occur.

Frequent walks and airings, chiefly during the cool moisture of the morning and evening, taken to some distant places from our sultry dwellings, will be another salutary practice.

It interrupts the action of the existing exhalations, and refreshes us by the help of a purer and more elastic atmosphere. It also assists the functions that are the most endangered, and frequently breaks the course of annual and accidental diseases. In most of the cities of Europe, where the streets are irregular, a long experience has shewn, that the most essential causes of their salubrity are, pure waters and public walks; and every means, both natural and artificial, has been employed to render the latter delightful. Fashion, in this point, has been invariably adhered to; and though public walks may be the theatre of a shewy style of dress and manners, or of idle talks and interviews, yet they notwithstanding remain a cheap means of exercise, whereby health is preserved and diseases dispelled. Sedentary life, long sittings in religious meetings, seclusion of one society from another, protracted clubs for various kinds of entertainment, for politics, for interest, and numerous and strictly fashionable tea-parties, are manners and customs particularly observed among the citizens of our metropolis. Can I then, gentlemen, be blamed, when I affirm, that, medically speaking, they have a contrary tendency to that of exercise, taken in a pure air, and a far

different effect to those of lively manners and more recreative life?

II. Another motive of security for the citizens at large, during the prevalence of a contagious epidemic, would be, I have already said, the removal of the sick, or an absolute cessation of intercourse with them. This measure, during the late calamity, was ordered by a proclamation from our governor. He was blamed by many who thought only of the inconveniences arising, in its execution, to the sick, who were reluctant to leave their homes and their chosen attendants; and the frequent instances of mistaken cases was another cause of their disapprobation of the measure. This opposition prevailed to such a degree, that many obstinately remained secluded in their own houses, died there, and their bodies were afterwards secretly carried to the distant graveyard of the Wigwam hospital. These inconveniences cannot be denied, but the efficacious and vigilant measures of authority might at last conquer them. The idea that they are a violation of the rights of humanity and of personal liberty, may be opposed by good arguments. Public safety, and a care for the health and lives of the community at large, have often commanded still more severe measures. At

this present time, if a person who is performing a quarantine on board of a ship or in the lazaretto at Marseilles, is detected in violating the limits of his confinement, the centinel has orders to kill him instantly, and yet this measure has been dictated by the voice of humanity.

Another argument will enforce the necessity of restraining personal liberty in cases of contagion. It is the customary right by which the neighbouring states exclude us from the usual intercourse with them. The time may come, which heaven forbid, when the contagious power of this epidemic, may suggest to neighbouring districts the necessity of a temporary seclusion, and particularly so, if severe regulations are not adopted among ourselves. Will it then appear inhumane, if we ourselves are obliged to forbid any communication with the sick, their houses, and the streets in which they are situated? The distresses of this severe measure would, no doubt, be softened, if several hospitals were fitted up, and a choice left to the patients of their own attendants. They could be thus supplied with more private accommodations at their own expence, while the poor and forlorn would be taken into those public houses which have been already sufficiently well regulated and supplied with every necessary by the vigi-

lant care, and generous donations of our citizens, during our past calamities. In fine, if these general measures are never adopted, we should at least be cautious to suspend any intercourse with the infected houses and streets, although it will be mostly too late when the contagion has been suffered to spread. Patriotism and candour, both of physicians and citizens, would soon ascertain the presence of the scourge. The mistakes of an isolated judgment may be obviated by previous appointment of many physicians to visit and consult upon each new case and patient. During the last prevalence, the public were cautioned that many deaths were ascribed to the yellow fever, some weeks before they would believe it; but they soon acknowledged that they received proper and timely information, owing to the attention of well known physicians. This is an unquestionable result from what we have stated of the nature and operation of putrid exhalations, that as soon as their first effects are discovered, in the early stage of the season, we might think it in our power to be prepared against subsequently created cases, and against the contagion from bodies. These are known to emit, in cases of death, almost none, and to become dangerous only in the last periods of the sickness when they recover.

III. There are other measures which experience has proved extremely successful for preserving even those who are obliged to remain in infected places. It has been officially reported to the governor, that, in the hospitals, during the late prevalence, the contagion had not spread among the attendants. This would be incredible were we not apprised of the reserves and cautions that are naturally made use of, invented, and dictated by necessity when it becomes the supreme law. The origin of the famous *vinegar of four thieves*, so much recommended as a preventive against the plague, is a proof of that beneficial industry, and I never found better or more medical means employed with success, than among those who do not hesitate to exchange many chances of danger against a valuable compensation. Yet all their industry is assisted with nothing else than what is in the power of every one. Resuming, my enquiries, and the effects of their general method, I found three results from taking various medicines and from diet. One is, that they reduced the system, and abated, consequently, any disposition to inflammatory or phlogistic diathesis; the second, that they kept themselves in a continual state of evacuation, and thus were never sufficiently acted upon by the contagious miasmata; and the last, that they re-

newed the bile and rendered it more pure, more fluid, and of a quite contrary state to that which constitutes a bilious malignancy. These three rules or indications are equal to any that the medical art can suggest and prescribe; and, as far as they could be well understood by individuals, and answered to by easy means, they would, I believe, mostly render the contagion harmless to healthy people, and justify a very frequent use of warm baths, previous bleedings, and the occasional administration of pukes and mercurial draughts, such as we employ in the treatment of our patients.

Some of my readers would, perhaps, here wish to be informed, as well as in every other medical work, what peculiar doses, powders, or pills, and the quantity administered, should be particularly employed as preventives against the yellow fever. I do not wish to make a secret of the most minute circumstances for the proper use of bleedings, pukes, and mercurial draughts, but I have already said enough upon that subject. A still more useful piece of advice shall here be given, viz. that it is not by *saturation* or quantity only that medicines are rendered efficacious, nor without those proportions and modification, which the various constitutions of different patients require, and of which physici-

ans can be the only proper judges. I consequently prefer that preventive medicines should always be prepared according to what is requisite for each constitution and by the previous indisposition of body. The most imposing name, affixed to a pill or powder, will not make it better, if given and employed without any necessary restriction whatever, but would, on the contrary, cover great blunders and mistakes. Such is the case of those patent medicines, which, in the immense catalogue of their virtual properties, include all the series of human infirmities, but which are at last given up as dangerous or equivocal remedies. To their patrons, however, I am willing to grant, that, if it was possible to ascertain above what point they are variously noxious, before any obtained success, and under which proportion they would fail or become useless, they would not be thought a great nuisance among the credulous, whatever power they may be possessed of.

The attendants of the sick should always be attentive to keep a fire in the patient's room, although the warm weather might render it uncomfortable. This I consider as a powerful mean for purifying and renewing the inclosed air, which is instantly absorbed with

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any morbid exhalation. The phenomenon of fire, cannot take place but by an immense consumption of air, and it thus becomes a drawing ventilator. This measure not only destroys any floating contagion for the benefit of the attendants, but I have observed it to be very useful to the patient, whose body should not be immersed in its own infectious emanations, and who cannot yet bear to be exposed to the variable external temperature. In fine, by the means of fire, a salutary and fragrant steam can be immediately procured, in the critical moment of fœtid and dangerous evacuations.

Various means have been also recommended as preventives by expanding round ourselves volatile and chymical substances to neutralise, as it were, the putrid miasmata. Although this method is very uncertain, yet much benefit may be obtained when the current of an artificial vapour breaks or alters a contagious one. These means, however, too often act unfavourably towards the constitution, and have a tendency to enweaken the nerves, while it is highly requisite that the body be kept in the very point of health. Every one knows, in this respect, the effects of camphor and of musk. The aromatics have a contrary and better effect, because they are equally tonics and anti-

sceptics. We should, therefore, constantly make use of their essential oils, of their artificial perfumes, and of the fragrancy of their plants. I have seen also the strongest vinegar generally used against pestilential emanations, and its ebullition with sugar upon red hot iron, produces an agreeable and salutary vapour.

Much has been said upon the subject of destroying or washing with caution the clothes and beds of the sick. None, I believe, are more infectious than those of a recovered patient. I have collected, on that score, the most satisfactory proofs, that a patient may be even re-infected in his own bed and clothes; and this is undoubtedly the origin of those strange cases, the stages of which run through a longer course, and repeated recoveries and relapses, which is quite contrary to the known periods of a malignant fever. It is perhaps useless and even inconvenient frequently to trouble a patient by giving him the comfort of fresh, clean, warm clothes, but it is absolutely necessary to do so as soon as a profuse perspiration has marked the end or a favourable crisis of the malady. If the care of the infected linen is left entirely to the nurses and servants, they must be directed to fold them immediately, and to throw them into cold water, where

they should be kept for twenty-four hours, covered with ashes to be filtrated into lie, with which they must be washed. The same care should be extended to the beds. At least they should not be used again but after repeated night and morning airings. In fine, the attendants should be careful to promote in themselves a constant spitting, and to avoid, as much as possible, swallowing the saliva. But let it be remembered, that, with these general cautions, and many more too tedious to be related, at the close of the seventh day, the convalescent patient can no longer transmit any contagion. His recovering state, is a proof of the purity of his blood. How distressing, therefore, would it be, under a false idea of danger, still to continue our intercourse with him with reserve and caution, when it is no longer necessary. He has been already too long obliged to consider himself as an object of terror and dereliction. To what a perilous despondency has he not been delivered by fugitive friends and relations! To what afflictive solitude has he not been condemned, while excruciated by a devouring poison! The arm of Providence could alone help him from under the two fold pressure of his body and of his mind! The former may counteract the laws of life as soon and as irrevocably as the latter! And ye attendants

of the sick, if a liberal and philanthropic mind ennobles your cares and services to your fellow beings; if you are not strangers to a moral sympathy—to the supreme maxim of doing to others as you would be done by; and if it is your pride not to value your dangerous task by pecuniary compensations, you deserve protection from heaven and respect from your fellow citizens. But such a meritorious claim is lost by mere mercenary services, which become baneful to unfortunate patients whom your expressed terrors and affected impatience, loudly bespeak as objects of horror in the creation. Despair, absolute despondency, and depression of spirits, will soon subdue the small share of organic strength left to them in this ferocious disorder. Their fate is in your hands, more than in medical skill, if charitable cares, hopeful words, and apparent confidence, are not continually and ingeniously offered, as the most successful comfort that will help, both the power of nature, and the wisdom of physicians.

ABSTRACTS.

First, Particular preventives against the yellow fever are deduced from its nature and

characters of highly malignant bilious. Its infection will have but little power, or none at all, against those whose bile is kept in a pure state, by vegetable diet, or light nourishment, and often renewed by depleting remedies, such as have been recommended for the treatment of the disorder.

Secondly, Refreshing exercise in the morning or evening, recreative life, and free from intense labour; antiphlogistic remedies, and other means as they occur to proper experience and judgment, are always sufficient to dispel that inflammatory disposition which aggravates a malignant fever, and to avoid an immediate effect from their miasmata.

Thirdly, Intercourse with infected people is to be carefully avoided: their houses should be under a singular guard and exclusion. Attendants of the sick are to be excepted, if they are particularly addicted to proper care and cleanness in their persons.

Fourthly, Attendants of the sick should subject themselves to more frequent use of the above remedies and diet under medical prescription. By keeping chimney fires in the room of the patient they will not be endangered. They are

recommended to have and take essences or perfumes of an aromatic nature ; and to make frequent fumigations with aromatic herbs and also with vinegar or sugar burnt on red hot iron.

Fifthly, Infected beds and clothes are objects of great caution, when not immediately destroyed. They may be safely kept in cold water, covered with ashes, to be filtrated into lie and washed with.

SECTION VII.

Histories of Cases.—No. I.

J. W. upwards of forty-five, was corpulent; sanguineo-phlegmatic, robust, and apt to indulge in the use of spiritous liquors. For some years, he had been subject, during the winter, to pains in the breast, and to congestion of bile in the stomach. He was soon relieved by diluting and depleting remedies ; but, after several relapses, I had sufficient reason to think his complaint a chronical one, originating from some serious cause. He opposed any further investigation, always depending upon a real cure. He was taken, on the 22d of July, of the

last season, with all the alarming symptoms of the yellow fever, and was treated accordingly. As his pulse was hectic, in the beginning, I was not surpris'd to find him worse on the second and third days. The evacuations were always colliquative and fœtid, his urine suppressed, and copious bleeding, could never abate the general symptoms. I affirmed, to his friends, that he would die in two days. I nevertheless endeavoured to enquire from his nearest relation into such circumstances as would lead to a discovery of the real chronical cause, which was so highly aggravating this acute malady; and it was at last discovered, that, for nine years past, he had been subject to what was termed, the gravel. Sufficient inductions could immediately explain my suspicions, although it was too late to remedy a diseas'd viscera. It was interesting to ascertain the case, and I obtained leave from the patient to introduce a catheter and a bougie into his bladder. With the first I found insurmountable obstacles; but, with the latter, I penetrated all the *meatus urinarius*, where I felt three strictures. The farthest was formed by the swelling of the prostate, and the bougie retained the shape of a screw. A last attempt with a catheter discovered a large and soft tumour arising from the neck of the bladder, and from it I drew

pure blood and clots of brown matter. The next day, the fifth, the patient was as yellow as a marigold; he seemed choaked with an infused fluid in his stomach, and he expired in the evening.

OBSERVATIONS.

It would be superfluous to explain the primordial cause of these strictures, of the swelling of the prostate, and the tumour projecting within the bladder. It would rather appear strange that the patient had so long complained of the gravel, without ever being obliged to apply to more direct and efficacious measures, if we were unacquainted with the indistinct and confused feelings of those who have long laboured under a chronical complaint. This patient was more affected by the effect than by the cause. When the secretions from the bladder and kidneys were totally disordered, the blood retained much of the urine, and caused the secretion in the liver to be more copious and corrupted. Thus frequent bilious congestions took place in the stomach, &c. With this previous complaint, the least degree of malignancy, added to the bile, could not but aggravate the rapid and fatal periods of the yellow

fever ; for no regular secretion could be settled again in the liver, or be drawn from the bladder. Both viscera were vitiated and diseased. To this and to any similar case, the only prognostic will be an immediate death.

CASE—No. II.

C. D. was a man of fifty years of age, of a very thin habit, with large and numerous blood vessels ; of a merry disposition ; and who had unreservedly used high food and strong liquors. He was still very cautious, in the month of October, 1793, and continued to live in a country place in the neighbourhood. The company of a friend induced him to come in town, and he was immediately taken. His previous complaints were said to be a constant rheumatic affection, in the thighs and hips. He had also frequently experienced paroxysms of gravel, and no more could be said on that respect. His fever was very high ; his face red, lurid, and all his frame agitated. A copious bleeding, nitrous drinks, and mercurial drastics, were administered in the second day. They afforded but a very short remission. The evacuations

contained very little bile ; the urine was very clear ; and he felt an uncommon prostration of strength. I had, from the patient himself, that he did not feel whether he had a stomach and a belly. I conceived him to be under a very fatal prognosis. Two other bleedings were ordered in a short interval, with more powerful evacuations, and an emetic. They had not the least favourable effects. He continued restless, asleep, and had a violent chill. His despondency grew more alarming. He lost all feeling. The jaundice came on rapidly, on the third day, tinged with a blackish hue ; and he died on the fourth.

OBSERVATIONS.

If the first mercurial draughts, administered a little after venesection and when the exacerbation abates, are unattended with a profuse discharge of green bile, we will probably fail in all the subsequent applications ; because there is not any other combination of remedies to overcome the increasing resistance of the morbid cause. Prostration of strength is, also, a premature symptom of death, when it appears without previous critical operations. In fine, the second exacerbation of this patient

came on with a chill, and nothing could be more ominous. Early on the second day, such were the certain signs of his death, yet I had drawn a much more positive prognostic of a fatal issue when I was first informed of his previous pains called rheumatic, and of his affection of the gravel. Whatever kind of obstruction may happen, in the urinary passages, they are mostly attended with numb pains in the hips and thighs. These mostly prove the existence of a diseased vicera in the *lumbar* region, which aggravates a malignant fever to death.

CASE—No. III.

A young gentleman, J. T. of a tender constitution, sanguineo-phlegmatic; of irritable nerves, sober life, thin habit, and subject to frequent weakness of the stomach, was seized with a shivering, internal burning heat, retching, spontaneous puking of bile, and the most tumultuous fever. Headach, pains in the limbs, with excessive anxiety of mind and body, had increased to an insupportable degree, when I first saw him; and nothing better could be done than to open a vein and let out twelve

ounces of blood. The usual mercurial draughts were given after the exacerbation, in very small doses, and their operation was very inconsiderable and contained very little bile. The urine appeared turbid and fetid. The second day offered a very gloomy prospect for the future issue. The countenance and look of the patient were confused, although he was beautifully red coloured, and I discovered retchings and some convulsions in the muscles of the arm and a general spasmodic state, with a slight pain in the pit of the stomach. His tongue was covered with a thick yellowish crust, and his pulse very hard. I thus judged that the smallest benefit had not been obtained, and that the case was more perilous. With the intention of opposing the spasms and irritation, of relaxing them to the greatest possible degree, and of procuring afterwards critical evacuations, he was ordered to be put into a semi-warm bath, and bled after it. With these previous means, it was probable that the operation of an antimonial emetic would be regular. It certainly answered to profuse evacuation of hepatic bile, but it drew the patient into the most alarming faintness and convulsion. We were then in the third day! I gave up all my hopes. Other remedies, as blisters, and draughts, were subsequently administered to gratify the soli-

tude of friends ; but the amiable youth rapidly shewed more dangerous symptoms. A deep orange colour suffused all over his body on the fourth day ; some black, yellowish, and fœtid stools took place, and his delirium increased to disparity. In the evening, he got up, could walk, and in many other exertions, surprised the vigilance of his attendants, until he was seized with agonizing pains ; he expired early on the fifth day.

OBSERVATIONS.

This is another of those melancholy instances in which a superior power overcomes, all at once, the strength of the body, the skill of the medical art, and the aid of natural exertions. In it I never experienced the least benefit from any kind of application, nor could I distinguish any thing but the rapid destruction of the whole frame. I could not regret that he had not lost more blood, since two copious bleedings had afforded no means of relief. I could not accuse the violent operation of a puke, which in its proportions and circumstances is not known to be of such a dangerous effect. But as I had been informed that the patient had been previously much subject to sickness of the stomach,

for which he repeatedly applied to medical aid, I more diligently enquired and remained, at last, satisfied, that he was in the case of a diseased viscera, and this explained why, early in the first day, his urine was so highly fœtid.

CASE—No. IV.

The most insidious case was that of B. a robust young man, of twenty-three, brought up to hard labour, of a bilious temperament, of a middling size and regular habit, strong nerves and hard fibres. The most particular care was paid to him, and he went through all the stages of the malady without any very alarming symptom; for he died on the eighth day, after a short agony, without any previous prostration of strength or a moment of delirium. Of the usual crises of the yellow fever, the jaundice only had been marked since the fifth day. It is true the urine was very rare, but bleedings, mercurial draughts, and other remedies, had all produced visible effects, and satisfactory relief. Every night the patient appeared to be refreshed with a few hours of sleep. If he had some anxiety, it was rather from

his mind than from his body. Sitting upon his bed, conversing, and directing himself the preparations of medicine, was his situation more or less, until the last moment of his life, and I confess that, during four days, he deceived my expectation. My reader will now recollect some observations made in p. 32, respecting dangerous symptoms, which it is so difficult to distinguish. I have there stated that want of sufficient evacuations of bile, loss of painful anxieties of the body, an uncommon degree of strength and chills preceding the fever, and muscular convulsions, were the only remaining but fatal symptoms in insidious cases. These were all the striking signs distinctly marked in this patient; and, in spite of the apparent mildness of all other symptoms, they always constituted an alarming prognosis, which the issue justified by a sudden death. It was very interesting to ascertain what previous disorder in the constitution, or in any viscera, had aggravated the case of this robust young man; but, if there was any, I could not discover it, and remained satisfied with that general opinion, that destruction of life is more frequently caused by unobserved violation of natural laws, than by effects that strike our senses and our feelings.

CASE—No. V.

Mr. F. d' E. a foreign gentleman, was taken in the latter end of August. He was upwards of thirty-six, of a pale complexion, tall and slim in his body, bilious-choleric in his temperament, of great sensibility, and of a sedentary life. Recent misfortunes had much undermined a constitution naturally strong. He had lately been subject to frequent indispositions of the stomach, and chiefly so fifteen days before his last sickness, during which time he had entirely lost his appetite. Probably he received the infection in the company of a friend who fell a victim, a few days before, and it quickly disturbed the operation of every function. His first and spontaneous pukings of the bile were very considerable, as well as his inflammatory diathesis. He lost near forty ounces of blood, in less than twenty-four hours. On the second day, all evacuations had been colliquative, fœtid, and without cystic bile. In the exacerbation of the following night, he complained of an internal burning heat, and his eyes appeared red and

inflamed. In vain did I again employ the best of an antiphlogistic method ; and neither antimony or mercury could stimulate the reservoirs of the bile. On the third day no dejection of the mind was remarked ; but, on the contrary, an incoherent conversation, a stupid and grim look, and a constant watchfulness prevailed, so that he could not bear the slightest covering in the way of bed-clothes, and was often indulged in the trial of several beds, to find a diversion to the anxieties of his body. At such a sight we gave way to despair, and medical prescriptions were but formalities of circumstance ! The urine was totally suppressed on the fourth day, a stricture on the breast succeeded, with great difficulty of the deglutition, and with an earnest desire of drinking, he hardly could swallow a few drops of any liquid. The jaundice was diffusing rapidly, leaving pale red spots on the joints. His spontaneous stools were highly foetid, black like soot, and full of white and red flakes, very similar to parcels of teguments of the bowels. Never, never, were greater ravages and putrescence seen in the human frame, except in the plague ! Yet the pulse was regular. On the forenoon of the fifth day, our unfortunate patient got up and completely dressed himself. With an uncommon vigour he came down from

a bed room, into the yard, to sit and converse with astonished friends. No longer than half an hour was the delusion of health and life given to him. Alas! an horrid look, a deep yellow colour, and a blackish hue diffused over his face formed a countenance which could no longer deceive a medical observer. The motions of his body were now answered by pains in the abdominalia; his pulse became convulsive; a tumultuous delirium marked his agony; and he died late in the night, when a great quantity of putrid blood burst and was discharged from the bowels,

OBSERVATIONS.

That the extremely malignant case of this patient had been aggravated by a previous state of sickness, is unquestionably true. From the best testimonies, proofs were derived of some obstructions in the liver, or of such *atrabilious* affections as are frequent among people of his turn and description. When all the animal fluids are vitiated, and of course their vital power enweakened, how great must be the power of a contagious virus on more corruptible juices? This instance, with such a principle, would then totally contradict the observa-

tion of Dr. Hoffman, upon those who labour under hypochondriacal complaints, whom he thinks are very rarely seized with epidemic or contagious diseases, or even with the plague itself. (*Hoffman's Practice of Medicine, chap. vi. art. HYP.*) If such an effect was ever observed to be true, it was surely owing to the use of those medicines to which such patients have constantly recourse to relieve themselves. As they promote at least several evacuations, they are, more or less, preventives against the absorption of dangerous miasmata. Never were the characters and symptoms of the yellow fever more strikingly marked, except in the black vomit, which did not take place. But the black matter was plentifully discharged from the bowels. It excoriated them and no doubt it infused itself into the abdominalia. The renewal of vigour, which so peculiarly and insidiously succeeds in the very last stage of the yellow fever, was extraordinary in this subject and equal to the violence of all other symptoms. At such a degree of the yellow fever, its medical investigation would not leave room to the least successful application. Its turbulent and rapid course could not be suspended by human aid; but let us trust to a more consoling opinion, which numerous facts will bring now to the most incontrovertible light.

CASE—No. VI.

A young man, of about twenty-five, of a florid countenance, plethoric habit, of a laborious and irregular life, was seized with a violent fit of epilepsy in the street. He was taken up and carried to his bed in that state of stupor which accompanies such paroxysms. His pulse was depressed and intermittent; but, as soon as he was copiously bled, he vomited a great quantity of yellow bile, and an exacerbation of high fever immediately came on, which caused another bleeding to be prescribed, with an antimonial emetic, a few hours after. It did not produce the least motion, although he had been bled twice, which I ascribed to the highest degree of spasmodic and inflammatory diathesis. In fact, his tongue and face were yet of a red fiery colour, and his sensibility was not yet restored. I feared that an immediate bleeding could not bring any further relaxation, nor procure evacuations of the bile, and that I should soon loose my patient. In this perilous situation, I could trust only to nature. The orifice of the bleeding was examined

and covered with a greased lint, and the bandage was relaxed with the view of procuring, during the night, a spontaneous discharge of blood, lest the next exacerbation should be kept up too high, and leave again a tonic re-action. No instructions were left to the attendants, for fear of dangerous misapprehensions. Nitrous and copious injections were ordered for every two hours, and a dose of mercurial drastic pills was given before the fever, and the same after it. All that had been foreseen and wished for happened. The fever soon became so turbulent on the delirious patient, that the blood bursted out from the orifice which had been prepared, and continued to run to more than fourteen ounces, and until the patient was deluged with it. The fever then abated with a relaxation; as the abdomen had been refreshed by many injections, the crisis happened to be more complete. The former emetic, and the mercurial pills, operated all at once, and they caused, in every way, prodigious discharges of dark green bile, which, by its acrimony, excoriated the sphincters of the fundament. Early the next day, I saw the patient in this favourable state. He felt extremely weak, but his pulse, and his skin were good. I continued and kept up the flux and evacuations from the bowels, until they appeared of a natural colour; and, on the forenoon of the

third day, the fortunate patient perfectly recovered and could resume his daily labour.

OBSERVATIONS.

It has been frequently seen, during the two last prevalences of the yellow fever in Philadelphia, that the breaking of the malady was marked by an epileptical fit, as it often happens in the small pox and several other cases; for, in whatever pathology epilepsy is understood, it is admitted that it may originate from strong spasms in the stomach and intestines. That the effect or action of a highly malignant contagion can at first be entirely directed on the nervous system, is likewise beyond any doubt. With these previous hints, and with the certainty that the patient had never been subject to that complaint, nor particularly to any other, the circumstance alone of the prevailing epidemic, justified an immediate treatment for the yellow fever. The continuation of the inflammatory symptoms after two successive bleedings, and the inefficacy of an antimonial emetic, evinced what has been already stated of the impossibility of delivering the body of the contaminated bile, or of the specific contagion, left an artificial or natural relaxation is timely brought on. The fact

also proved, that I ought not to have hesitated for a third bleeding, in the first day, although two preceding ones proved inefficacious; but I yet question whether the effect of the latter had been so well applied as the spontaneous bleeding, the measure of which I left to the force of the next exacerbation. Be it as it may, the profuse discharge of dark green bile, was as sudden as the resistance had appeared obstinate. Another interesting ground of observation occurs in the above case. What is the reason of its being evolved in so short a time as three days? The most fortunate stages of the yellow fever do generally run during seven days, and was not the former instance an ephemerical case to be judged in a far different manner, and absolutely distinct from the yellow fever?

All these objections will be fully explained, to the reader, if he recollects the pathological rule abovementioned, concerning the periods and duration of malignant fevers. They have been observed to be included in four or seven days, and sometimes in nine, and even in fourteen. Admitting, consequently, that the illness of this patient had begun several hours before his epileptical fit, we will find this resolution corresponding exactly to the fourth day. But

another reason strikes us when we consider that the issue of the malady must, necessarily, depend very much upon the effect or quantity of the specific contagion that has been diffused from the bile into the blood. When the former is timely evacuated and renewed, the latter remains to be purified. This operation we have said, nature may perform, within a certain space of time, and with the help of artificial or spontaneous means; supposing thus that the contaminated bile has not had sufficient time to communicate its virus to the blood, and that it has been speedily all evacuated, nothing will remain to be done; and with this obtained effect, the disorder will be put to an end; but if, on the contrary, the blood has been infected, then the fever and all its symptoms attending the malignancy of its cause, will last, more or less, a certain time, until a perfect depuration has taken place. In fine, the short duration of this violent case will still be more justly ascribed to the preservation of the blood in its natural state, if we recollect the numerous and familiar cases of those who have certainly received the infection, judged its first effects, and speedily counteracted them, yet without any further consequences of illness.

CASE—No. VII.

H. L. an aged woman, of a lively disposition, active body, and industrious life, had remarkably spent thirty years of her life in the most perfect health. In attending the sick, who had recovered, she took the infection. Although she had all the usual symptoms and puked much, she thought but little of her case. She had herself bled copiously, applied a blister to her breast, and hardly permitted herself to be under medical direction. I saw her late in the evening of the second day, full of courage and spirits; but, as during the remission of the fever, her pulse was hard and tense, and as she was in an unnatural agitation, her case was, at least, very serious. The epispastic plaster was immediately taken off. Diluting drinks, and carminative and nitrous injections were ordered, with mercurial drastics in pills at different times. All these remedies answered very well, and produced copious evacuations of green bile. On the fourth day, the pulse was yet a little convulsive, and the exacerbation brought on a delirium. Thinking it not very necessary to

relax the system, by means of bleeding, for fear of counteracting too much the organic strength of an aged body, I gave a cathartico-emetic, with previous dilutings. One grain of antimoniated tartar, dissolved with an ounce of salt of glauber, in a quart of water, a half a pint of which was to be taken every two hours, caused little retchings, but produced a prodigious evacuation of yellow, green, brown, and clammy matters. The resultion of the disorder was presumed, and some opium was administered. Yet, on the sixth day, we were threatened with a melancholic disappointment. An eruption of small red petechiæ appeared on the breast, thighs, and arms; the root of the tongue was bordering on the black colour; the pulse was bad; the stomach threw up every thing, without much anxiety to the patient, who seemed reduced to an alarming prostration of strength, and some black blood had been discharged by the stools. Two circumstances only supported my hope; the jaundice was yet almost imperceptible, and flatulencies in the large intestines, with a tendency to local inflammation and *teneſmus*, promised a favourable and determined crisis. Fomentations were ordered on the abdomen and mercurial draſtics were given again, with alternative doses of castor oil. At last a purulent and bloody

flux settled itself and lasted till the ninth day, for the preservation of the life and perfect recovery of the patient.

OBSERVATIONS.

In two instances, during this treatment, it seemed uncertain whether it was justifiable to have omitted more frequent bleedings. Yet this reserve, I would never neglect in aged people, who are sooner brought to a dangerous weakness, than to a salutary relaxation, whose fluids besides are never of the same inflammatory degree as observed among young subjects. The good constitution of the patient, I own, helped her in these uninterrupted evacuations during nine days; but from this case what remarkable inductions of their importance may we not deduce notwithstanding the symptoms are dangerous, and although the patient should be in momentary but deceiving appearances of recovery!

CASE—No. VIII.

A. M. upwards of forty-five, full of juices, of a plethoric temperament and strong consti-

tution, which had been a little impaired by a deep wound received in the breast, took the yellow fever, as many people did, by keeping a good tonic and uncautious life in a distant country place, and then coming occasionally into town, and exposing themselves to our sultry and impure atmosphere. Two copious bleedings, a warm bathing, nitrous injections, diluting drinks, cathartico-emetics, and mercurial drastics, procured sufficient evacuations of bile, and nothing altered the regularity of the exacerbations. On the fourth day, a considerable eruption of small red petechiæ broke out, almost all over the body, and the patient informed me of a violent pain felt in the parotid glands. A cool sweat diffused all over his head, and he was in a great febrile anxiety. Foreseeing a salutary crisis from the mouth, I rendered the drastics more mercurial and safely waited for the result. The swelling of the parotids rapidly came on. It broke out on the seventh day with an insupportable stench and the most profuse salivation. The patient could not speak, and large ulcers on the gums and fauces, rendered his deglutition very difficult. It was a pleasing prospect that this crisis would throw off the contagious matter from the inmost recesses and happily terminate the yellow fever without any further necessary application ; but

the inflammation of the mouth grew so alarming that it threatened with danger of another kind, whilst the patient could not swallow any nourishment, and as the internal erosions gave way to frequent small hæmorrhages. Such an irritating cause excited a symptomatic fever, attended with extreme anxiety of the mind and body. The infection from the salivary glands was so great that it was insupportably smelt, even at a great distance from the patient, and in spite of an ardent chimney fire. It was indeed received by many persons; and upwards of two gallons of saliva was one day evacuated. Care was taken to relieve the gums, by cleaning the teeth and scraping out several thick scales. Gentle antiseptic and astringent emulsions were used in the way of frequent gargarism. To the absolute cessation of nourishment I substituted injections, with the liquor of boiled beef and mutton. It was, in fine, but at the tenth day after the salivation, and the sixteenth of confinement, that the patient began to recover from his misery and from the yellow fever.

OBSERVATIONS.

The quantity of calomel, mixed with other drastics, and administered to this patient be-

fore the crisis of the mouth was promoted, could not be more than ten grains in my own preparations. Yet, agreeably to the intention of evacuating the bile, it had been all precipitated downwards, by the power of other draughts, and after very particular observation; so that nothing or véry little of that specific medicine could remain in the *primæ viæ*, to promote such a salivation in a man of strong constitution. It is true, that as soon as its approach was perceived and determined, more mercury was used; but always with the caution to direct its effects towards the bowels. It thus remained to be concluded, that the crisis was altogether spontaneous, and such as may succeed in every malignant fever, and once out of ten cases in the yellow fever.

A remarkable circumstance also fixes our attention in this subject. Whatever means of resolution we have seen terminating the yellow fever, I do not remember of a single instance without jaundice, except when the swelling and suppuration of the parotids have been spontaneous. If the morbid bile, thrown into the blood, constitutes the regular duration of the malignant disorder, within a certain space of time, with the visible effect of jaundice, it is a fact, that, before this morbid fluid could

be confined in the last recesses of the circulation over the skin, it may be determined by admirable laws, but almost unknown to us, to fix itself within the salivary glands, from where it will poured off, like a torrent, in a more diluted state. This happy effect will, then, suppress the jaundice and evince the necessity of a crisis, to help the patient in getting rid of so great a quantity of noxious and morbid fluids. The above case, with one of the following, will also suggest further cautions to the attendants; for the infectious matter poured off by salivation appeared to be more intense, and of a more penetrating malignancy than is commonly produced in other secretions. The operator who had cleaned the teeth of this patient, was immediately taken with an horrid pain in the arm, and an eruption on it of a gangrenous nature, of which I shall speak hereafter. As long as the ptyalism is kept up, the ensuing discharges, which in these cases are purulent, and form a sediment, should be received in vessels prepared for the purpose, and half filled up with lime or any other absorbant earth. The linen likewise, so often wanted to cover or wipe the mouth, should be frequently changed and washed with the same care as above described, &c.

CASE—No. IX.

A girl of twenty, sanguineo-choleric, healthful, and previously indisposed, by impressions from cold and moisture, was taken with the most violent symptoms of the prevailing epidemic. The usual applications of copious bleedings, of mercurial drastics, bathings, &c. answered in the most satisfactory manner, and nothing very remarkable occurred until the fourth day. The evacuations had been so profuse and acrid that inflamed excoriations had ensued and formed a large ulcer on the *levator ani*. She was now in a great despondency, and sometimes delirious; her tongue was covered with a thick yellow crust. Happening to take her hand and feel her pulse, she suddenly screamed in a most violent manner, and she complained that I had broken her arm; being not a little surpris'd and thinking such an assertion a delirious one, I freely retook her hand, but screaming again, she looked at me with horror, &c. When appeas'd by proper words, she convers'd very sensibly, and absolutely convinced me

that the least pressure upon her limbs was answered by the most excruciating pains in her bones. It was enquired what were those pains when she moved herself, or her limbs. She answered that she felt pains every where, that she preferred to be motionless, and that they were more violent in the extremities. Unobserved trials were made to ascertain the truth of the whole; and nothing could be more certain nor more strange. This stage of the malady was the most critical, and although she began to be yellow on the breast, and the face, some other crisis was to be expected, and to its approach I attributed this incomprehensible diagnostic. It was rather pleasing to reflect that, if the want of organic sensibility would have been alarming, this extraordinary addition to it could on the contrary be taken as a favourable sign. Having observed a tendency to some evacuations, of the uterus, emollient fomentations were ordered on the inguinal regions, and the calomel mixed with emmenagogues was continued. These strange pains continued four and twenty hours, but decreased gradually as a critical and abundant discharge of corrupted and very offensive blood took place. The convalescence was immediate and the recovery perfect.

OBSERVATIONS.

If the lues venerea, the scurvy, the arthritis or any other malady vitiating or obstructing the lymph, are marked by pains in the bones and in their articulations, it will not appear impossible, that the virus of this malignant fever, yet more subtil and infectious to animal fluids, will produce the related effects, when it has been poured into the circulation. If a slight touch could exasperate such pains, it was the effect of a nervous mobility, which is seen often productive of more astonishing effects. The whole of these symptoms were yet of a favourable augur, however bad and alarming this stage of the malady appeared to be, since nothing could better prove the genuine and unadulterated state of vital laws, than acute sensations in the inmost recesses of the body.

 CASE—No. X.

M. S. a gentleman upwards of forty, corpulent, robust, and healthful, lately from the European continent, prone to a sedentary life, but regularly addicted to a wholesome and light diet, was taken during the fever of 1793. Unacquainted with all the fatal circumstances of the prevailing epidemic, he applied to some

simple evacuating remedies, until his state grew very alarming, towards the end of the second day. At this moment, a friend who slept in the same room with him, and who had been neglected during four days of sickness, was dying. All these circumstances threw him into dreadful convulsive motions. A vein being opened, the convulsions increased, and never ceased but by the means of an antimonial emetic, the operation of which produced much good and gave some regularity to the course of the malady. At the first appearance of an exacerbation of fever, having proposed blood letting, the patient, who never was bled before this attack of sickness, and to whom the last bleeding had not appeared beneficial, utterly refused to comply with this prescription, and simple depleting remedies only were used.

On the fourth day he was in a great dullness, dejection, and despondency of mind; livid and yellowish large petechiæ appeared and covered his body: but a more alarming symptom was that of a violent singultus or hiccough immediately acceding. The reader must be informed, that the liberty of directing this treatment was every day checked by the patient. Although little hope was entertained, the opportunity of his delirium was seized to

administer antiseptic and drastic injections, with blisters. The jaundice, the petechiæ, and the hiccough, seemed to be aggravated, and at last, to our great astonishment, on the fifteenth day of his sickness, symptoms were seen of a recovery which proved effectual and perfect.

OBSERVATIONS.

It must be confessed, that medical theory had but little participation to this unexpected cure. Moreover, this was one of those memorable instances, and not uncommon indeed, in which particular laws and symptoms being unobserved, we are especially deceived in our prognostics and mistaken in our fears. It is to be lamented that, in such cases, the medical art is not in possession of more decisive rules than those which are commonly observed; for there is no fatal prognostic, but we may find, although very seldom, its exception for a contrary issue, and no favourable admitted symptoms but were also succeeded by unexpected death. No doubt, this limitation of human knowledge devoted, more than once, victims to a fatal or premature dereliction, and raised opprobrious reproaches against the medical science;

yet reason and experience will unite to justify human errors and ignorance, as long as we will be furrounded by mysterious laws in nature. But what we can say is that if every age has added new treasures to our solicitous investigations, why should we despair to disclose at last all the means that may concur to the safety of our life and preservation of our health? With this just confidence, practitioners in physic will never think that task superfluous devolved to them of attaining, by one way or another, to that philosophical stone of their profession, THE ART OF CERTAIN PROGNOSTICS. Its elements, it is true, are perhaps as extensive as all the causes concurring for the phenomenon of life, and as much as the innumerable combinations that may counteract it; but let us indulge the consoling hope, that that analysis, which has submitted to our speculations, as many extensive laws of nature, from the rolling planets and lightnings above, down to the ambient fluids which are unperceived by our senses; the same analogies, I say, might sometimes, and with a far more glorious success, embrace all the laws of nature, round the bed of a patient. This is a theatre, where we only can investigate effects almost unknown, and seldom adverted to in schools and books; nay, effects

unavoidably and often mistaken by the influence of methods and systems. If I dare to declare it and to appeal to my judgment, I believe there is not a judicious and experienced physician but whose opinion is settled safe and free, when conceived rather on the bed side of his patient, than when aided by any other authority.

By what expression or power, in the countenance of a patient, without any reference to symptoms and circumstances, are we determined? Is there not something undefined in the motions, or in the muscles, in the correspondence of these with the mental faculties, that equally contradicts received opinions, symptomatic results, and suggests true prognostics? If we can point out frequent instances where our judgment has been strikingly decided by means, thoroughly unaccountable, would it be impossible to analyse them, or to direct our attention to many others? Let us rather fear, that, in fact, we are not sufficiently acquainted with the laws or effects of life and health. Our physiological methods seem to have included a series of most striking circumstances; and a veil has been thrown upon any thing apparently unattainable by the multitude. We judge of debility and we have no certain scale

of the vital strength applicable to all ages and cases. We remark several degrees of fever, and we remain absolutely ignorant of its hydraulic and statick causes. We conceive that life cannot be without motion, and it would be impossible for us to reconcile its acceleration with health, and its abatement with death. After long observations we have known, the degree of our animal heat, when in a state of health, and of its variations necessarily resulting from cessation of health, we could not exactly apply a single one to any malady whatever. In fine, the operations of the mind we subordinate to the precepts of our art, and from those of a patient we hardly could know how to derive some help for our success. Many other points are bounds and limits of our knowledge, and will long render it imperfect. But if the few which I have mentioned give a true, though imperfect idea of what it remains to us to be acquainted with, to be unexceptionable good judges in human diseases, I have sufficiently justified unavoidable errors of practitioners in their prognostics, after having exemplified the spontaneous and natural cure of one of the most fatal disorders.

CASE—No. XI.

An unmarried woman, of thirty-six, of sanguine complexion, regular habits, and nimble body, went through the first stages of the yellow fever, without any alarming symptoms. Our usual applications were faithfully observed except in one point. She was so extremely prejudiced against the very name of mercury, that it would have been a very provoking measure to insist on its exhibition, without disguising it. I therefore diminished considerably the doses, and involved them with aromatic essences. It was not perceived in the least and nothing disturbed our harmony; because the known efficacy and stimulating power of that specific on the salival glands could never take place. On the fourth day, while she was in every way worse than ever, she complained of a dull pain in the parotids, without any apparent swelling; emollient fomentations were ordered round the neck and on the breast. On the sixth day the swelling and inflammation of the mouth were settled; on the se-

venth, coming into the room of the patient, an insupportable stench absolutely similar to fermentation of fœces struck me, and it could not be discovered to originate but in the salivation, which continued near eight days, profuse, regular, and successful. No jaundice appeared on the body of the patient. The presence of the infecting miasmata could never be entirely covered by fumigations and other ingredients. Nobody came in the house of this female, until she began to recover, but were immediately indisposed or effectually took the yellow fever.

OBSERVATIONS.

As the smallest quantity of calomel has been known sufficient to promote a salivation among delicate and irritable constitutions, I would not deduce much from this instance, if I had not been obliged to employ means which were to counteract absolutely such effects. Moreover, it was never observed that the patient felt any previous and gradual affection in her mouth, as it is so common and unavoidable to be acted upon by that mineral specific. It was no longer administered than was necessary for the evacuations of bile,

even since the third day: yet the crisis rapidly attained to the highest degree, with the perfect cure of the patient. It therefore rested with me to judge this swelling and supuration of the parotids, to be merely a spontaneous crisis, such as occurs in malignant fevers and in the yellow fever, but such as is useless and dangerous to promote artificially, among those who might be of a different tendency and cured by a different crisis.

CASE—No. XII. *and last.*

I am of a bilious choleric temperament, and irritable nerves. The least indisposition, and chiefly the presence of infectious exhalations, is so soon felt, that neither can obtain time enough to aggravate itself. As often as I had perceived the dangerous effluvia, I also experienced a subsequent indisposition, of which, speedy and proper means always prevented me from knowing any further consequences. When I thought necessary to scrape the teeth of the patient of the above case, No. 10, which being covered with thick scales, exasperated much

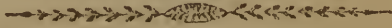
more the inflammation of the gums, I really put too much my senses, with my hand, in contact with a very subtle and infectious emanation. The consequence was, that I soon felt a very numb pain at each side of the condyles, on the lower extremity of my right *os humeri*. It is a very remarkable circumstance, that, from an eminence of those condyles, several muscles of the hand and fingers take their origin. The pain grew so insupportable, while it was independent of my motions, that small doses of opium were requisite for necessary rest. Emollient and resolute poultices really exasperated the pain, and my anxiety, was as often renewed, since I could only form conjectures of its probable cause. A few days brought on a more serious diagnostic, a violent headach and disordered functions, which speedily suggested the necessity of an emetic. This was the first means of relief that I found to my pain; and while I was submitting myself to the operations of mercurial drastics, I discovered that the infection of the yellow fever was the cause of my strange indisposition. On one part, copious discharges of dark green bile, were repeatedly obtained, and on the other, my elbow swelled and inflamed. Numerous *phlictenes*, full of sania, formed on it and broke out; thick teguments turned black and detached in a scab

of two inches in diameter, with the absolute cessation of any pain and a perfect restoration of health.

OBSERVATIONS.

We have already seen, that Pouppe Desportes notices the *malady of Siam* to be sometimes remarkably preceded by suppurations of the joints, and dry spots of mortification on the skin. He accounted for these and other extraordinary symptoms, by the effects of a poison, which he called *pestilential*, that sometimes fixed itself in parts distinct from the viscera. This poison is, most commonly, inhaled through the mouth, in respiration, whence it diffuses through the alimentary channel, disturbs, at first, all its functions, and contaminates all its fluids. The absorbent lymphatic vessels take their rise from the skin, which may determine such a singular case, whenever they come in contact with the infection, so immediately as I did when my hand and fingers were introduced into the mouth of the patient. Whether the subsequent violent illness was symptomatic of the affection of the arm, or whether I had likewise received the infection in the bile, I am not able to determine; though, to me, the latter seems most

probable, as the pain remained invariably on the same point, and never extended further up the *os humeri*; and yet, the morbid cause in the viscera was proved both by the illness and the evacuations. The cutaneous teguments which really mortified and formed a pretty thick eschar, preceded by *phlictenes*, were my demonstrative proofs of the virulence of a poison which had on the skin as much power as a burn, when seconded by natural exertions, and emollient poultices, it exuded outwardly. This instance will, above all, justify my above theories and observations on the greater danger of infection from recovering patients: the more contagious miasmata they throw off, the more certain is their recovery.



CONCLUSION.

GENTLEMEN,

I WOULD, perhaps, deserve the reproach of having assumed too great and bold a confidence, if I now should omit earnestly to solicit your indulgence and that of the public.

The subject I have treated, requires undoubtedly longer investigations and many more of those qualifications which are necessary to a writer. It is true, the language to which I was obliged to entrust my observations, which never was that of my youth nor of habitude, could not be but a rugged and difficult road, where I ought to have feared to entangle my reader. To such a consideration, I had surely sacrificed my emulation and my attempt, had I not been much more impressed upon with the duty of joining what I could of my views to all those from which the whole nation expect to derive some relief against so great a calamity. Truth could never be attained, if discussions from various sides and opinions were not alike instituted by free and liberal communications. The public claims, as it were, that every one should be listened to who thinks that he can contribute to the common welfare. It is of no importance if the learned are divided among themselves, it always is and always will be so, until the truth comes out. There are besides principles or opinions which are not to be exclusively for the learned, whatever may be their contest and systems. On the contrary, if these opinions are good and safe, they spread and propagate among the people at large, because there is much reason and good

ſenſe, and no party ſpirit among the people. This is the cauſe why it has happened ſo often that the public have adopted ſound and definitive opinions, while the learned had not yet ſettled their own variances. J. James Rouſſeau reports, that a peaſant of Silcſia had the honour of ſettling a great and ſerious ſcientificall conteſt among the learned in Germany, who could not agree, or explain, in the ſame way, how a child could be born with a golden tooth!! He firſt thought it neceſſary to eſtabliſh the fact, and this he took the trouble upon himſelf to do, which he proved to be a falſhood.

Far be it from me, gentlemen, by relating this fact, to throw out any alluſion againſt phyſicians of this city, with whom, I am not ſo happy as to agree in opinion, on ſeveral of the above ſubjects ; it will be ſufficient, perhaps, to declare that I profeſs the greateſt reſpect for many of them ; but there are many inſtances to prove, that, in matters of fact and reaſon, the tribunal of the public opinion will, at laſt, be the beſt judge. It was thus in Marſeillies in the year 1720. While the plague was rapidly ſpreading and raging, phyſicians and ſurgeons publicly declared, that the prevailing diſeaſe was not the plague, nor even contagious ; and

the famous Dr. Astruc had to contend against all of them, until the fact and the public proclaimed the plague. Unfortunately, Philadelphia will be exposed to the dreadful experience of more facts, and then the public will decide against all the alledged authorities and systems. Thus to the public, as a fellow citizen, I thought it my duty, to fulfil this task, and to you, gentlemen, as a physician, to present my investigations and experience. Besides, if every man be indebted to the country and community to which he chooses to belong, it is my peculiar satisfaction in being enabled to pay this tribute of gratitude to the citizens of Philadelphia. On these motives, therefore, I ground my claim for the indulgence I solicit for this publication; and, however imperfect it may appear, in the extent, discernment, and foreign dress of my observations, if, among the possible sarcasms of criticism, no kind of merit would be bestowed on my work, still it will remain as a proof of labour and philanthropy; the one is the virtue of a citizen, and the other the character of a physician.

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POSTSCRIPT.

IT has been without reference to anatomical or physiological discussions that I have explained the proximate cause of several symptoms and of the jaundice in the yellow fever, by the immediate passage of the infected bile into the blood from the *pori biliarii* into the vena cava, or at last by the simple and immediate absorption of the bile into the lymphatic vessels, which exist in that viscera as numerous as in many others, when it is stopped or obstructed in its excretory ducts. I was led to that indifference by contemplating that each theory resuming the same result of the admission of the bile in all our fluids, it was unnecessary to state by what process it had taken place. Another argument also struck me in this acute disorder, as well as in many others, in which the jaundice is frequently an attending symptom or a crisis, although I have not mentioned it in any of the above reflections. Each of our secretions have more than one object of necessary

operation to fulfil for the animal economy. Thus it can be said, that the simple perspiration of the skin, while evacuating a superfluous fluid, washes and opens the pores. The secretion of urine not only filtrates and reduces the blood to its proper degree of fluidity, but it is a vehicle intended to carry off any heterogenous substance admitted into it. The bile, prepared in the liver, besides being a necessary liquor in the digestion, will be the means of discharging from the blood those elementary substances which were created and added to it by the *chylification*. But, if the bile originally received its component parts from the blood, we must suppose that as soon as its secretion is interrupted, the blood will retain all those component parts; they will then gradually increase to such a quantity that they will be by another law emitted in the recesses of the circulation, and there form the jaundice. Therefore, in any theory we may admit three origins of *icterus*; one by the infusion of the bile already formed, and poured from its excretory ducts into the last ramifications of the vena cava; another by the absorbing lymphatic vessels; and a last, by the biliary component parts retained and remaining in the blood whenever that secretion cannot take place. Other circumstances enforce the possibility of this last means of jaun-

dice, when we consider how many causes may retard the circulation of the blood in the vena portarum, in consequence of some inflammation or morbid action within the abdomen, where are situated all the branches that form its trunk. It is also admitted, that, in warm countries, the powers of circulation are much enweakened, by which means the large vessels may be distended, and the bile not sufficiently renewed or diluted. Hence arise bilious disorders and bilious evacuations, &c. Such are the general grounds by which I ever thought that several symptoms as well as the jaundice in the yellow fever, might equally be understood in any of the above theories; but, I have since had the opportunity of considering a very solid objection against a presumed cause of the jaundice in the yellow fever, admitting that, by observation and satisfactory experiments, it has been proved, that, in case of stoppage or obstruction, the bile is sooner, easier, and even immediately resumed by the lymphatic vessels, instead of the veins. This absorption, it is said, cannot originate but with a stoppage of the bile in its excretory ducts, or with an obstruction in the liver; yet neither are found by dissection or symptoms, in cases of the yellow fever. Its jaundice, therefore, constitutes no similarity with any other kind

of remittent fever or bilious disorder; and it is yet a problematic subject and a *morbus sui generis*. This objection, I must own, came to me from a respectable quarter, and is connected with so many other authorities of facts and opinions, that it indispensably demanded a serious consideration of the subject, in order either to correct my pointed errors, or to balance the argument by satisfactory reasons. In the mean time, to my medical reader it will obviously appear, that, my only motive for this controversy, is from a consistency and adherence to the chief opinions of the subject upon which I have treated. Thus it will be stated,

First, as a general view, that the formation of jaundice in any case of the only cessation of proper secretion of bile, acknowledges so many probable causes, different from any sort of obstruction in the liver, that it could not be confined to the theory of the absorption of lymphatic vessels. We see the possibility of an inflammatory and morbid action in the abdomen from the intestines or the stomach, and from the diaphragm, immediately distending or obstructing the blood in the numerous branches of the vena porta, and suspending the circulation in that large vessel, more probably so when we consider

that this heavy column of blood must be assisted in its course, by all the surrounding motions and vibrations. Now, it will always be safe to conclude, that, if the blood does not secrete in the liver, and particularly so in acute fevers, the principal character of which is a disturbed circulation, it will keep the bilious component matter, which it should lose, in the liver, and from that must arise an accidental *icterus*. But it is objected, that, even in this case, bile should be left in the blood, as it finds its elements in the liver. I deny that however, and very confidently, until it shall be proved that water could be obtained without *oxygen* or *hydrogen*; or that in any of our glands there is an inexhaustible quantity of the component parts of *oils, acids, salts, water, &c.*

Secondly, The possible and immediate infusion of the bile from the *pori biliarii* into the minutest ramifications of veins and arteries, is by no means improbable or impossible, although it is granted that their lymphatic branches (as they appear to be) do not belong to the absorbent system; for injections have been made, with success, from the *hepatic duct* into the *vena cava* and *vena porta*. But nothing could better prove, this immediate infusion of bile into the blood, than frequent cases of sudden

jaundice, by a wound on the head, by too great hæmorrhages and profuse bleedings, by a fit of passion or anger, and also by the effect of strong and acrid medicines. It occurs very often also in practice, among ordinary and quite contrary cases to any kind of *hepatitis*, when we find, chiefly towards the end, the eyes of our patients very yellow. This is a certain degree of jaundice; yet it could not take place in consequence of obstructions, nor by the minute process of all the windings of the absorbent system*. The bile has, therefore, been immediately squeezed and poured into blood vessels.

Thirdly, Were the absorbent power of the lymphatic veins the only means and cause of jaundice, it could not certainly proceed but by such stoppages and obstructions as after a while would force and open the valves of the mouth of the said lymphatic veins; for, in any other state, the absorption of the bile could not be affected, as is proved by our usual state of health. But we see the contrary in the yellow fever; no previous symptoms

* Some anatomists contend that nothing is more rapid in the circulation, than the absorption of the lacteal vessels and lymphatic veins. This I grant; but what will be said if the fluid exposed to absorption becomes thick and tough?

induced us to suppose the formation of an obstruction. Spontaneous and profuse evacuations of bile, and a great quantity of it acrid, always diffused all along the alimentary channel, seems to prove, that the usual excretory ducts are opened, and that the only quality of the bile is altered. Let us, then, turn the argument in another manner. There is no obstruction of the liver nor stoppage of the bile in the yellow fever, yet the jaundice regularly takes place; this must, therefore, proceed from some other possible means of jaundice.

Fourthly, Is there no other state in the conglomerate glands, but that of obstruction, that can disturb the secretions and then expose their fluids to the effects of the absorbent system? Are they not subject also to a quite contrary state, to that of *atrophy*? Although we cannot precisely account for their mechanical functions, must we not suppose, that, what we call an obstruction, when we see a hard exuberance, or feel a heavy swelling in some parts, that this state has been preceded by several degrees of congestion and *infarction* which considerably distended the vascular, villous, or *parenchymatous* substances, and, of course, much better favoured the transfusion of certain fluids, within the absorbent system. It is not

indeed when we feel an obstruction in the liver, or a skirrus, or any other unnatural alteration, that we should fear that other operation of the lymphatic veins; because in this state, various fluids have no longer any circulation nor connection among themselves; but on the contrary, this absorption has more probably taken place when the obstruction was forming, and when the fluids were yet sufficiently liquid in their circulation. It is not, therefore, necessary, to have any visible obstruction in the liver or stoppage in the excretory ducts of the bile, to have a subsequent jaundice; this without the former happens in the yellow fever, and it is often seen without obstructions, nor skirrus in several instances. It may then have originated solely from the entickening of the bile in the *pori billiarii*, &c.

Fifthly, Let us never confine ourselves within narrower bounds, than those which belong to the admirable laws of nature. Such a large and important viscera as the liver must have more than one means to discharge the bile which it cannot empty. That of absorption only would be eventually interrupted or inconsiderable. The blood may resume it, to a certain quantity and pour it into the kidneys, or into any other secretion, as known facts have frequently proved. I also, readily believe, that the

lacteal vessels may take it from the intestines, when there is nothing in them but bile, and discharge it into the *thoracic* duct, along with the lymphatic veins. I hope, therefore, that the above argument, the ground of which I had less the intention to remove than to explain, leaves principles enough with sufficient means to the above theory on the yellow fever, and to all the subsequent opinions.

A famous doctrine has been introduced into the medical world, and it is yet vigorously supported and even improved by numerous partizans. We may call it the doctrine of direct and indirect debility, or the stimulating system. The supporters of it say, that it has succeeded to the imperfect doctrine of spasms and constrictions, the same as this latter had exploded the old and more imperfect one of viscidty and lentor. It seems that unfortunately that by those methods of definition, modern and ancient discoveries are equally marked either with exclusive advantages or with reproachfull defects. Thus the ungracious abuse of words finally will divide learned men, as it evidently created many heretics, and sectaries during past ages of christendom. Yet whatever may be the inflexible dogmatism of those who mistake true learning, by praising only one doctrine, who will de-

ny but every judicious physician considers it as his duty to examine all doctrines, and all methods, with an impartial and unbiaſſed mind to call to his aid all the good results from observations and principles. It was with the motive of avoiding the abuse of words and definition that I introduced only the name of Dr. Brown in my note, p. 29, the author of the doctrine abovementioned; although I ought not to have omitted to observe that the actual professor of the institutes of medicine, was not precisely subordinate to the Brownian system; since, on the contrary, he has improved on it, by his excellent views on *morbid excitement on the preternatural and convulsive actions of the blood vessels*, on the inequality in fevers, of *excitement and excitability*, and on the necessity of abstracting what we should call in other words, spasms, irritation, inflammation, &c. and, in one word, suggesting the relaxation without which no salutary crisis are ever obtained.

It has been said, in page 14, that as “ we
 “ have not any publication, collectively, from
 “ that body (the college of physicians) that could
 “ exhibit more, and stronger arguments than
 “ merely their opinion of its importation, I sup-
 “ pose that is unnecessary for me to say any
 “ thing either for or against the opinion.”
 This might be deemed a material inaccuracy

if I should not add a necessary explanation. That body, has, in several circumstances, published the authentic facts, by which it has appeared that the disorder has been imported from foreign countries. The reader will remember, that I have not drawn the least controversy from any of the facts concerning the importation of the fever nor of the means which have been alledged to have spread it. Their authenticity and most striking circumstances never could weaken the contrary belief, which implies the eventual generation of the fever on board of ships from tropical countries, and as it is contagious, we do not deny that an infected seaman might, of course, communicate it to his attendants. If a whole crew also or a part of it, came from a known infected place to another of very hot temperature, they surely may be dangerous. These chances are acknowledged or granted; but, to such chances we will not give up a matter of principles, of analogy, and an opinion, the arguments of which, in the constitution of the air, are even employed by the opponent believers. Therefore, if the facts proving the importation to others, prove to me nothing else than the generation of the yellow fever on board of ships, it will not be improper to conclude, that with *only* such arguments one side has nothing stronger than merely their opinion.

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