

and use doses preventive or curative, the larger the less resistant the animals are, he will find:

1. That in order to protect a guinea-pig against a dose of venom lethal in twelve to twenty-four hours it will be necessary to inject hypodermically 8 c.cm. of serum in the right flank at the same time as the venom is injected into the left flank or the thigh.

2. That in order to cure a guinea-pig after injecting a dose fatal in twelve to twenty-four hours 15 c.cm. of serum must be injected two hours after and 20 c.cm. four hours after the poison has been introduced into the system. A successful result will then be invariably obtained.

3. That in order to protect a rabbit weighing 2 kilogrammes against a dose fatal in twelve to twenty-four hours it will be sufficient to inject 4 c.cm. of serum instead of 10 c.cm., as in the previous case. The serum is injected in the right flank, whilst the venom is injected into the left flank or into the thigh.

4. That in order to cure a rabbit after the administration of a dose fatal in twelve to twenty-four hours it will be enough to inject 4 c.cm. of serum half an hour after injecting the venom, 6 c.cm. an hour after, 10 c.cm. two hours after, or 20 c.cm. four hours after.

5. That in order to protect a dog weighing 8 kilogrammes against a dose lethal in twelve to twenty-four hours, it will only be necessary to inject 6 c.cm. of serum in the flank at the same time as the venom is injected into the thigh.

6. In order to cure a dog which has received a dose fatal in twelve to twenty-four hours, one has only to inject 10 c.cm. of serum two hours after the injection of the venom or 20 c.cm. four hours after.

Therefore I have a right to say that in the case of man, who is much more resistant to venom than the dog, weight for weight (as is proved by some rare accidents following the bite of indigenous vipers, some of these showing the resistance even of children) a dose of 10 c.cm. of my antivenomous serum will be more than sufficient to prevent intoxication and death—that is, provided this dose of serum be injected two, or even four, hours after the snake bite. The most dangerous venomous snakes of tropical regions seldom kill man in less than eight to twelve hours.

Besides, practical experience proves that I am right. It is now nearly two years since the use of my antivenomous serum was introduced in India, in Algeria, in Egypt, on the West Coast of Africa, in America, in the West Indies, Antilles, etc. It has been very often used for men and domestic animals (dogs, horses, oxen), and up to now none of those that have received an injection of serum have succumbed, however long the intervention has been delayed. A great number of observations have been communicated to me, and not one of them refers to a case of failure. It is, indeed, a lamentable fact that in Australia, where accidents from snake bites are numerous, the use of antivenomous serum does not yet prevail, and that practitioners continue to prefer the use of strychnine, which has no efficacious properties against the venom.

I am sure that, if Dr. Martin repeats the experiments in the manner I have just pointed out, he will agree with me. He will be able to verify that the absorption of the serum takes place much more rapidly than that of the venom, provided the serum is injected in a sufficient dose. He will also recognise that the immunity produced by the serum is immediate if it be injected intravenously. I think that in practice the intravenous injection of serum is useless in man; but it furnishes an excellent means of estimating rapidly and surely the degree of activity of the antivenomous serum.

When one wishes to ascertain whether a serum is sufficiently active, the following method should be adopted: One determines first with any given venom (weighed in the dry state and diluted with a certain quantity of water) the dose which, when injected into the marginal vein of the ear of a rabbit weighing about 2 kilogrammes, will cause death in fifteen to twenty minutes. This dose being determined, the two following experiments are made:

1. A first rabbit receives into the marginal vein of the right ear 2 c.cm. of serum. After five minutes the dose of venom (lethal in fifteen to twenty minutes for an animal of the same weight) is injected into the marginal vein of the left ear. The animal should show no sign of discomfort; it should resist indefinitely.

2. A second rabbit first receives the venom (the same dose fatal in fifteen to twenty minutes) into the right marginal vein. After five minutes, when it begins to show respiratory embarrassment, 4 c.cm. of serum are injected into the left marginal vein. The animal should before long revive entirely and begin again to eat.

These two experiments are very easily repeated, and they prove abundantly how rapidly the serum renders insusceptible the cells of organism which are affected by the venom. All our serums are capable of acting at least preventively in doses of 2 c.cm., and we are now preparing others which are still more active. Our immunised horses can bear up to 1 g. of dry cobra venom, injected all at once intravenously, without being in the least incommoded, whereas by 10 mg. of the same venom a fresh horse is rendered seriously ill.

It has taken us three years to obtain this tolerance, and undoubtedly we shall make further progress. Contrary to the opinion of Dr. Martin, we do not think it would be useful or desirable to establish centres for preparation of this serum in different countries. This preparation is extremely difficult and delicate; it requires much time, a good deal of patience, and it demands continued watchfulness. The vaccinated animals have to be watched continuously.

We have in the Pasteur Institute of Lille a special staff and a working stock which now enables us to meet the wants of the whole world. We have erected hothouses where venomous snakes of every kind sent to us by our correspondents produce in abundance the venom we want. Dr. Martin is justified in expressing the hope that in a few years the antivenomous serum treatment will give us the means of preventing the large mortality occasioned in so many countries by snake bites.

ENTERIC FEVER IN INDIA: ITS TREATMENT ON THE ANTISEPTIC PRINCIPLE.

By BRIG.-SURG.-LIEUT.-COL. RICHARD H. QUILL, M.D., A.M.S.

STATISTICS OF ANTISEPTIC TREATMENT.

THE purpose of this paper is to give a plan of treatment which I adopted during my last tour of service in India, and which I found to reduce very considerably the mortality of the fever under consideration. Early in 1893 I commenced systematically to treat all cases of enteric fever coming under my care on the basis of the antiseptic principle, and continued to do so up to November, 1895, when I left India. The result has been as follows:

(a) Number of cases treated	...	...	...	46
(b) Number of deaths	...	...	...	2
(c) Percentage of mortality	...	...	...	4.3

I am well aware that statistics in connection with enteric fever are in many respects unreliable, the more especially when the number of cases under treatment has been, comparatively speaking, small. I therefore in no sense submit the above figures as being in any degree decisive; nevertheless, it is a gratification to me to be able to record them, the average mortality of the fever I am discussing being in India seldom below 20 per cent. None of the 46 cases were diagnosed as examples of enteric fever without careful consultation and a unanimity of opinion as to the type of the fever. This precaution ought to dispose of criticism directed against the accuracy of my diagnosis of the cases in question. The 46 cases were consecutive, all had practically the same treatment, and many of them were severe examples of the fever. In the 2 cases which proved fatal recovery was hopeless, the fever in both being of a most malignant type. Before giving any special details of the treatment I advocate, some preliminary observations appear to me to be called for.

DIET.

No drug or combination of drugs can possibly exercise a favourable influence on the course of the enteric type of fever unless the suitability of the dietary and the efficiency of the nursing be above suspicion. No detail in connection with these important items of treatment ought to be ignored. As my experience has increased, I have come to realise with more conviction how very limited is the gastro-

intestinal digestion during the acute stage of enteric fever. I am further convinced that nowadays there is a very undesirable tendency on the part of physicians to over-feed patients suffering from that fever, an error arising from some latent feeling that the more nourishment we can induce them to swallow the better will their strength be maintained. In this connection I would instance an over-abundant administration of milk. Four or even five pints of milk are ordered for a twenty-four hours' consumption, with the addition probably of a pint or more of beef tea, and at a period of the fever when the absorptive power of the patient is quite unequal to the task it is asked to accomplish. What is the result of giving food in these cases, all of which cannot be absorbed? It means the introduction of decomposable material into an intestine which, for the safety of the patient, ought to be kept as free as possible from such material. It means, moreover, the maintenance of diarrhoea, when intestinal rest is of the utmost consequence, and further, it means the production of tympanites.

Consideration of these points ought to impress on us the obligation of laying down precise directions in regard to all matters connected with our patient's feeding, and when doing so to endeavour to estimate aright the extent of his absorptive power. Thus, if we find he cannot absorb satisfactorily three pints of milk in the twenty-four hours, give him two pints; if he cannot assimilate two pints, give him, for the time being, only one pint, and peptonise that limited quantity.

I can testify from experience to the manifest benefit which frequently accrues to enteric fever patients from the temporary diminution of nourishment just advocated.

Further, a correct judgment as to whether our dietetic arrangements are judicious or otherwise can only be arrived at by a daily and systematic inspection of one or more of the patients' stools. This is an important duty which is too often neglected or passed on to the supervision of the nurse.

Sir W. Broadbent writes: "The secret of success in treating enteric fever lies in a constant examination of the stools." Wise counsel, for such inspection informs us how far the milk we are giving to our patient is being assimilated, and thereby affords us an invaluable guide for his judicious feeding.

The following diet table is the one I am in the habit of handing to those responsible for the nursing of my enteric fever patients. It is subject of course to occasional modifications, but, taken as a whole, it contains, I think, all that is essential for the efficient nutriment of those passing through the acute stage of enteric fever.

Notes of Case.	Time.	Two ounces of Soda water to be added to each portion of milk.				Remarks.
		Milk.	Beef Tea.	Soda Water.	Medicine.	
Name	6 A.M. ...	6	—	—	—	
Age	7 " ...	—	—	—	—	
	8 " ...	6	—	—	—	1.
	9 " ...	—	—	—	—	All milk to be boiled.
	10 " ...	6	—	—	—	
Disease	11 " ...	—	—	—	—	2.
	12 NOON ...	6	—	—	—	To each pint of milk add 1 ounce of the following
Day of disease	1 P.M. ...	—	—	—	—	alkaline mixture:—
	2 " ...	—	—	—	—	
Diet	4 " ...	6	—	—	—	3.
	5 " ...	—	—	—	—	Alkaline Mixture.
	6 " ...	—	—	—	—	R Sodæ bicarb. ʒss
	7 " ...	—	—	—	—	Sodii chloridi ʒj
N.B.—20 ounces, equivalent to 1 pint; 2 table-spoonfuls equivalent to 1 ounce.	8 " ...	6	—	—	—	Aquæ ʒxij
	9 " ...	—	—	—	—	Ft. mistura.
	10 " ...	—	—	—	—	
	11 " ...	6	—	—	—	
Date	12 midnight	—	—	—	—	4.
	1 A.M. ...	—	—	—	—	The antiseptic mixture to be given immediately after
	2 " ...	—	—	—	—	a portion of milk or beef
	3 " ...	6	—	—	—	tea. The frequency of its
	4 " ...	—	—	—	—	administration may be lessened in mild cases.
	5 " ...	—	—	—	—	
	Total ...	48	16	—	10	

A copy of this form, filled up daily, should be hung up over the patient's bed-head to the information of the orderly attendants.

On examining this table it will be found that milk, boiled, diluted, and made alkaline is the basis of the dietary I recommend. Two and a half pints of milk, at suitable intervals, are usually ordered for a twenty-four hours' consumption. This quantity of milk may, in most cases, be advantageously supplemented by 16 ounces of well-made chicken broth or beef tea. If there be evidence of any undue exhaustion, the occasional addition of an ounce or two of raw meat juice to a portion of milk, or the yolk of an egg previously whipped up in a little boiling water and added to the beef tea, will be found most beneficial.

Alcohol is not given as a matter of routine, but is kept in reserve as a drug of inestimable value when certain conditions call for its employment. I would urge the daily examination of the heart, the pulse alone being a fallacious guide, and on the smallest indication of a weakening of the first sound becoming evident, the administration of alcohol should without delay be commenced. When the morning temperature has fallen to normal and has remained at that level for two or three successive days, it is in my judgment an evidence that the specific element of the fever has spent itself, and is an indication that we may safely but carefully increase the nourishment of our patient. Thus egg flip, a little stale bread boiled in milk, and a small quantity of fresh butter spread on some soft biscuit, will be useful additions to the dietary.

At this period of the case I am in no way concerned should the evening temperature continue to rise a little above normal. Indeed, such a rise is almost invariable for a week or more after the morning temperature has fallen to normal and remained there. This evening rise is no evidence that the specific element of the fever still remains; it merely tells us that the nervous system has not yet recovered its equilibrium, and upon such nervous disturbance the administration of increased nourishment will have only a beneficial effect. Nothing really solid in the shape of food should be given until all pyrexia has ceased for a week or ten days.

NURSING.

In relation to the nursing arrangements, there is one detail upon which I should like to dwell, as on many occasions I have found it a most valuable help. Should any distension of the abdomen or appearance of blood in the stools be noticed, I invariably direct an ice poultice to be applied to the abdomen, and to be kept there more or less continuously until all disquieting symptoms have disappeared. As my method of using an ice poultice is somewhat peculiar I will describe it:

I take an ordinary surgical cradle made a little broader than usual, and inside the cradle I attach a specially made ice tray. This tray is made of a light tin frame, about 14 inches long by 10 inches broad, the sides being 2 inches deep, and pierced with a few holes. A floor for this frame is made by attaching to its sides a piece of thick flannel, lined on its outside with oiled silk. The tray thus made having been lightly filled with small lumps of ice, is placed inside the cradle, and attached to its hoops by means of tapes. It is thus suspended over the patient in a way that will permit the floor of the tray to be lightly in apposition with his abdomen.

I can confidently recommend this detail as being very effectual in dealing with two symptoms which, in enteric fever, must ever be a source of anxiety. This "ice tray" has a still further use. Should there be no abdominal indication for the apposition of ice, we may employ the tray as a controller of temperature. The cradle tapes are shortened, so that the tray is merely suspended over the patient's body, in much the same way as Dr. Fenwick directs his "ice pails" to be used. Then, by throwing a light sheet over the cradle, leaving an aperture at either end, a constant current of cooled air will surround the naked or lightly clad patient, keeping in check his temperature, whilst his general comfort is increased.

The advantage I claim for this modification of ice cradling is that with one apparatus we have the means of either surrounding our patient with cooled air or of applying to his abdomen an effectual and safe ice poultice.

EARLY TREATMENT.

When a fever of a continued type in its early stage comes under our care it is frequently impossible to decide offhand as to the exact nature of the type. Thus it may, in its subsequent course, prove to be enteric or after a few days all suspicious symptoms may disappear, the fever being due to some gastro-intestinal disturbance or to malaria. The rule I follow in such doubtful cases is to treat them from the day of admission, both dietetically and medicinally, as if they belonged to the enteric type. Such practice is, I think, judicious, for

should the fever prove to be a veritable case of enteric no valuable time has been lost in dealing with it, while, on the other hand, should it turn out that we have to deal with a simple febricula or fever of the malarial type no harm has been done to the patient by our caution.

Should the case come under our care within the first week of fever, 2 grains of calomel are given on the night of admission and half that quantity is given on the following night should there be no special contra-indication to its use. I look upon this preliminary use of calomel as a highly important item of the antiseptic treatment of enteric fever. Calomel is not only a hepatic stimulant but an antiseptic of no small power; thus its use at the commencement of an attack of enteric fever not only removes all retained fermenting matters in the intestine, but disinfects the gut as well, and so places it in a favourable condition for the subsequent maintenance of antiseptics.

Should constipation occur during the progress of the fever a simple enema is given, supplemented if necessary by half a grain of calomel, while should there be, on the contrary, a tendency to undue looseness an enema of starch and opium, with perhaps 10 grains of tannic acid or subnitrate of bismuth added to it, is directed to be given.

THE ANTISEPTIC METHOD EMPLOYED.

Coming now to the more special treatment of the fever, I would urge that our aim ought to be the production and maintenance of intestinal antiseptics. This desirable condition can, in my judgment, be greatly promoted by the free use internally of some reliable antiseptic. I at once admit that it may not be possible for the antiseptic agent we employ to enter the blood current in sufficient abundance to exert there any influence of importance on the product of the bacilli, the typhotoxin, which we presume to be the prime cause of the group of symptoms, taken together, which make up our conception of enteric fever. But we have to remember that the bacilli which produce the typhotoxin grow and multiply in the wall of the ileum, and presumably on its mucous surface. If this be admitted, it is reasonable to suggest that in the intestine the potency of the bacilli can to a large extent be neutralised by the free internal administration of some reliable antiseptic; on doing so we cut off a large depot, so to speak, for the production of the specific fever element. Looked at from this standpoint, the production and maintenance of intestinal antiseptics is, I submit, a highly important remedial measure. It renders harmless, to a large extent, the bacilli in the intestinal canal; in other words, "the reserves" which supply to the blood the fever poison.

But success will be endangered if we omit to give our antiseptic early in the fever. Each day that is lost in allowing septic products in the intestinal canal to remain there unneutralised, and to be diffused in that condition throughout the system, will obviously tend to lessen the efficacy of the antiseptic we may eventually employ. I would therefore urge that in all suspicious cases of fever coming under our care there should be no delay in commencing the free internal use of some reliable antiseptic.

The antiseptic combination I recommend in enteric fever, and the one I have employed in the cases upon which this paper is based, is carbolic acid and chloroform. I usually prescribe them as in the following formula: *R. Acid. carbolici purissimi ℥xxxvj (Calvert's No. 1), tinct. chloroformi co. ℥ij, tinct. cardamomi co. ℥ij, syrup. aurantii ℥j, aquæ chloroformi ad ℥xij. M. Ft. mist. One ounce with an equal quantity of iced water to be taken every second or third hour immediately after food.*

In mild cases of enteric fever five or six doses of the above mixture are given in the twenty-four hours at suitable intervals; while in severe cases ten doses are given. It is advisable to continue its use in from three to five doses daily for at least a week after the temperature has fallen to normal. Doing so decreases, in my experience, the occurrence of relapse. I have found the above combination not only efficient in an antiseptic sense, but most palatable; the latter quality in medicines is at all times a desirable one, but more especially so in a fever of the enteric type, where it is of the utmost importance to keep the stomach in good humour, and as undisturbed as possible. I have never had

to omit this mixture for any untoward effect produced, nor has any patient of mine on any occasion made the smallest objection to taking it; more than can be said for other antiseptic combinations I have known prescribed.

It may possibly be argued that owing to carbolic acid and chloroform being very diffusible bodies they would leave the alimentary tract long before they could reach the lower portion of the ileum and exercise there an antiseptic influence. To such an objection I can only reply from the standpoint of practical experience, that the antiseptic combination I recommend, if given as advised, does satisfactorily disinfect the intestinal tract. The best evidence is that the stools under the use of the medicine almost invariably lose their unpleasant odour, and are maintained in that condition if the treatment be persisted in. One case bearing on this point clearly comes to my mind as I write.

A case of fever which promised to be of a very severe type came under my notice. From the patient's breath and body an odour almost putrefactive exhaled and the "septicæmic stools" passed were so intensely offensive that all in attendance were nauseated by them. The man was at once placed on full doses of the carbolic acid and chloroform combination, with the result that within twenty-four hours all unpleasant odour from breath, body, and stools had disappeared to the very great comfort of all engaged in the nursing duties.

I think it may be fairly claimed that, in this case the dispersion of the unpleasant odours was due to the disinfectant action on the intestinal canal, and it may be on the blood, of efficient antiseptics administered with freedom.

In past years, although carbolic acid has been more than once recommended as a reliable antiseptic in enteric fever, it has never been generally adopted. I believe that this neglect of the remedy would not have happened had it, in proper combination, been given with much more freedom than is usual. To give the acid in doses of πj or πij three times a day is a mere trifling with therapeutics in their relation with the fever under consideration. If satisfactory results are to be looked for, an acid of trustworthy purity must be given in full doses, properly combined, well diluted, and at short intervals.

In the series of cases upon which this paper is based were several which took a large quantity of carbolic acid before convalescence was established, but in none of the cases were any ill-effects noticed which would be ascribed to the pure acid I use. One patient took from first to last over 2 ounces of carbolic acid with an equal quantity of chloroform, and in other cases $1\frac{1}{2}$ ounce of each drug was taken, yet the urine never became black, or anything approaching that colour; occasionally it became a little high-coloured, that was all.

But I am far from wishing to press unduly the merits of the particular combination of antiseptics I employ to the exclusion of other drugs similar in action. What I am contending for is the principle of treating cases of enteric fever with the aim of producing intestinal antiseptics. So long as that condition is secured I am very little concerned as to the method by which it is brought about. I certainly recommend the combination according to the formula I have given, because I have observed excellent results to follow its exhibition, results which have not, in my experience, followed from other antiseptics, and I have tried most of those recommended. In this connection I would make an exception in favour of eucalyptus oil, which I have used in a few cases, and with results quite as favourable as those which have followed the employment of carbolic acid. Indeed, the only objection I have to make against eucalyptus oil is its flavour, which is decidedly objectionable to some people. If, however, the stomach does not rebel against the oil, I would employ it with quite as much confidence as I do carbolic acid.

The following is the formula I have used when prescribing eucalyptus oil: *R. Ol. eucalypti, ℥j; mucilag. acaciæ, ℥j; spt. ammon. arom., ℥ss; glycerini, ℥ij; spt. chloroformi, ℥ij; aquæ chloroformi ad ℥xij. M. Ft. mist. Sig: One ounce every third or fourth hour.*

An extended trial of the new antipyretic compounds, such as antipyrin and its congeners, has made me very sceptical as to the wisdom of using them in enteric fever unless under exceptional circumstances.

To reduce a protracted high temperature, and to keep the pyrexia, generally speaking, within moderate limits, I invariably trust to cold bathing or ice packing, a measure which not only reduces the unduly high temperature, but gives at the same time a beneficial flip to the nervous system generally.

To avoid misconception as to what I claim for the free antiseptic treatment of enteric fever, I will, before bringing this paper to a close, briefly state my case. The cure of any disease must be conditional—that is, we cannot truly estimate the value of any remedy we employ in disease unless on our commencing its exhibition the possibility of a cure exists. A fatal termination under any form of treatment is what, unfortunately, we have occasionally to expect, and for such an eventuality we must be prepared, even though our patient be at the time well under the influence of our pet remedy. Dr. Burney Yeo has very justly remarked “that occasionally fierce and destructive conflagrations occur which water will fail to extinguish. Yet none the less is water an extinguisher of fire.”

In connection with this observation I would say that more than once I have seen remedies tested in cases, obviously in a hopeless condition, and discredited because a miracle did not follow on their employment. I claim no “miraculous properties” for the antiseptic combination advocated in this paper, but I do maintain that its free use (in conjunction with the other items which, taken together, make up the antiseptic treatment of enteric fever) will reduce the mortality of that fever from 25 to 10 per cent., or even less. Surely that is no small gain!

CONCLUSIONS.

I will state my case in this way: Take 100 cases of enteric fever, as that fever is observed in India, and treat them expectantly with a well-arranged dietary and efficient nursing; from 70 to 80 of those cases will recover, leaving a mortality of from 20 to 30 per cent. Treat a second batch of 100 cases with the same dietetic and nursing arrangements, but instead of the expectant treatment, or rather in addition to it, employ the antiseptic system (which I may remind all readers of this paper does not solely consist in giving so many doses of an antiseptic mixture), and instead of a death-rate of from 20 to 30 per cent. we shall have something about 10 per cent. So much, and no more do I claim for the antiseptic treatment of enteric fever.

I will bring this paper to a close by stating explicitly and succinctly certain effects observed during the progress of the fever, which I ascribe to the method of treatment advocated in this paper:

1. Intellectual clearness of the patient, with very slight tendency to delirium or stupor.
2. Food invariably well assimilated.
3. Abdominal distension except to a very moderate extent, invariably absent.
4. Early cleaning and moistening of the tongue; dryness very rarely present.
5. Stools almost completely deodorised.
6. An offensive odour from breath or body of patient rarely observed.
7. Tendency to undue looseness of bowels rarely present.
8. Secondary complication of any kind never noticed.
9. The fever pursued its course “kindly,” with little distress to the patient.
10. Convalescence rapid and complete.

I was unable to satisfy myself that: (a) The duration of the fever was lessened; (b) that there was any marked and continuous lowering of the thermometric range; or (c) that an occasional tendency to relapse was removed.

A CASE OF PERNICIOUS BERI-BERI.

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Now that the subject of tropical medicine is at last about to receive that attention which most assuredly it deserves, the following case of pernicious beri-beri seems worth recording. It also may not be amiss to recount the various stages passed through on the road to its diagnosis.

At the end of the year 1888 I went out to Manila, taking with me a fair experience of alcoholic paralysis and the knowledge that beri-beri was also a peripheral neuritis, which, however, sometimes assumed an oedematous form. Passing through Hong Kong I visited Mr. Ho Kai. From him I learnt that, owing to the efforts of our old fellow-student Mr. Takaki, beri-beri had been practically stamped

out of the Japanese navy, and that this change had apparently been effected by the introduction of a more nitrogenous dietary. Mr. Ho Kai also told me that a case of undoubted beri-beri had recently occurred in a member of the local British colony. Absolute immunity was not therefore to be obtained merely by the liberal indulgence in nitrogenous food, nor was the Britisher to be regarded as being exempt from the disease.

Arriving in Manila, and calling on Mr. Donelan, I was surprised when, speaking of the cholera epidemic of 1882 in that city, he informed me that an even more fatal epidemic of beri-beri had immediately succeeded it—an epidemic which, as I afterwards learnt, according to the estimate of Roeniger,¹ caused the death of 20,000 people, the mortality reaching 60 per cent. In this epidemic no children were attacked, but the susceptibility of women after parturition was very marked. As a result of this conversation I now modified my mental picture of the disease and began to associate its symptoms with the paralysis of diphtheria (which I then regarded as a peripheral neuritis) rather than with the neuritis of alcohol.

The first few months of my residence were consumed in acquiring a superficial knowledge of Spanish, together with my licence to practise. At about the end of that period I was consulted by a young half-caste lady, the wife of a patient, as to an ingrowing toenail. For this I performed partial avulsion under a local anæsthetic; and three days afterwards, calling to see her, I found her walking about the house in comparative comfort. Two days later I received at night an urgent message to visit her, as she was dying. Arriving at the house they told me that two or three hours before she had been seized with shortness of breath, and had lain down on her bed complaining of what was apparently an acute attack of indigestion. I found her sitting up in bed suffering from well-marked orthopnoea; her face blanched, and covered with cold perspiration; her pulse was 140, and her temperature subnormal. With difficulty she was able to ejaculate that she felt intense substernal pain, and that she was dying. Hastily examining her chest, I found dulness and absence of breath sounds extending posteriorly and equilaterally up to the angles of her scapulæ; while above, and over the whole of her thorax anteriorly the lungs were filled with minute crepitations suggestive of œdema; the cardiac sounds were practically inaudible. By chance some of her urine was obtainable, and with this I drove off to my consulting room, in order to test the specimen, and to fetch such remedies as might be necessary.

Examination of the urine showed absence of albumen, so, taking with me an aspirator, and such drugs as suggested themselves, I returned to my patient, pondering over the pathological obscurity of her symptoms, and wondering at the fact that I should have heard, for the first time in my life, what appeared to be crepitations characteristic of œdema at the apices of the lungs. The general appearance of the patient, and the suddenness of her attack, suggested pulmonary embolism, while the physical signs pointed to a partial and equilateral thrombosis of the pulmonary veins—a condition impossible to more than momentarily contemplate. Returning to the bedside I examined her legs, and found some slight œdema of both; her condition was now yet more grave, and within two hours she was dead. I certified the case as one of heart disease, and though by no means prepared to be cross-examined as to this, I remained unshaken in my belief for a space of about a fortnight.

During this period I happened to visit an acquaintance of my late patient, an elderly half-caste woman, who, referring to the phenomenon of the sudden end of one so young and apparently healthy, remarked that the cause was “certainly beri-beri.” This observation my limited knowledge of Spanish most fortunately compelled me to let pass—for my association of beri-beri with the neuritis of diphtheria had not gone so far as to admit of the possibility of death in a few hours in a case of the former disease. On this same day, interviewing my late patient’s mother, I learnt from her that her daughter had suffered from slight œdema of the legs for some days before her death. How long she did not know; nor did my operation throw any light upon this, for, refusing to take chloroform, she had, with characteristic native modesty, merely exposed to my