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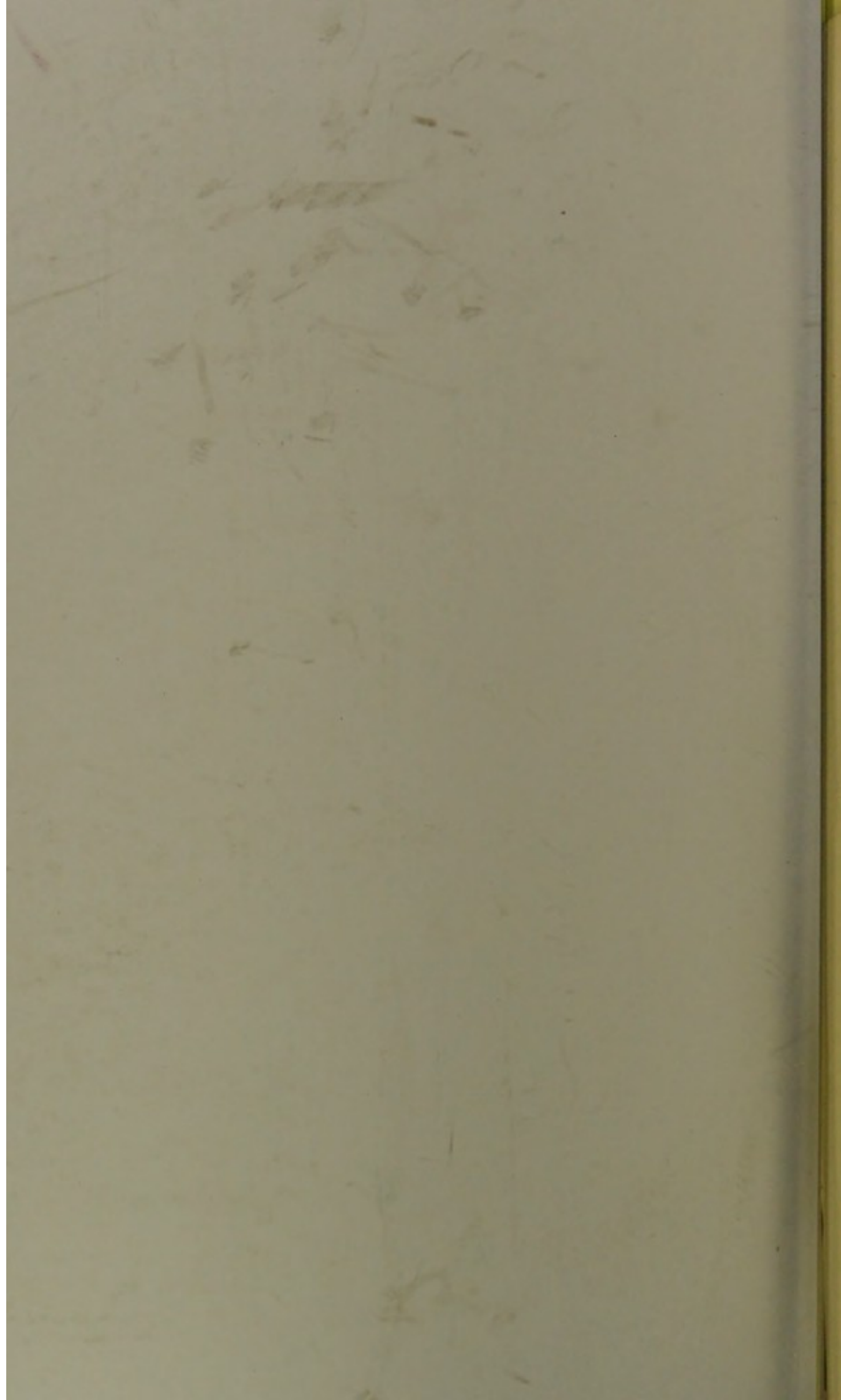
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From the Author

ON THE
MEDICINAL QUALITIES
OF THE
BEBEERU BARK OF BRITISH GUIANA.

By DOUGLAS MACLAGAN, M.D. EDIN., F.R.S.E.,

LECTURER ON MATERIA MEDICA, ETC.

(Extracted from the Lond. and Edin. Monthly Journal of Medical Science for August 1843.)

MEDICAL QUALITIES

BERBERU BARK OF BRITISH GUIANA.

BALFOUR AND JACK, PRINTERS.

BY DOUGLAS MACKENZIE, M.D. ROYAL COLLEGE OF PHYSICIANS.

LONDON: 1884.

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ON THE MEDICINAL PROPERTIES OF BEBEERU BARK.

(Read before the Medico-Chirurgical Society of Edinburgh, July 12, 1843.)

Some time ago, I read before the Royal Society of Edinburgh a notice regarding the chemical history of the Bebeeru tree of British Guiana, which the Society has done me the honour to insert in the 15th volume of their *Transactions*, and of which an abstract was given in the last Number of THE MONTHLY JOURNAL, (p. 651.) I there mentioned that the bark and seeds of this tree yield two alkaline bodies, to which I have applied, from the Indian and Dutch names of the tree, the terms Bebeerine and Sipeerine, the sulphate of which has been proposed as a substitute for sulphate of quinine. The observation of the febrifuge qualities of the bark of this tree was first made by Dr Rodie, late surgeon R.N., who pointed out the existence of a vegetable alkali in the bark, but without examining it further. My own experiments have been directed towards a more extended examination of the bark and its constituents, but have not yet been carried so far as to have completed the ultimate analysis of the latter. I have, however, ascertained that the bark will yield a sulphate of its alkalies, tolerably pure considering that it is uncrystallizable, and that this salt may be prepared at a cheaper rate than sulphate of quinine. Should it therefore be found, that the medicinal qualities of this bark entitle it at all to be placed in the same category as the cinchonas, it may yet, from its being a native of one of our own colonies, and from the tree being both large and abundant, become an important substitute for quinine, when the latter is rare or scarce.

It is with the view of adducing some evidence as to its powers as a remedy, that I have collected the few cases which I know to have been treated by it, trusting that by this I may induce those who may have the opportunity, to test its applicability as a substitute for sulphate of quinine.

The therapeutic action of bebeerine, so far as it has been observed, appears to be in a marked degree antiperiodic. Every one, however, who is at all conversant with the history of the vegetable materia medica, is aware of the difficulty of deciding, whether or not a substance is really possessed of antiperiodic virtues. Almost every one of our ordinary bitter tonics has at one time or other, been held in estimation as a remedy for agues; and even substances which seem to have little or no physiological action on the system, such as charcoal, appear occasionally to have the power of arresting the disease. It seems in fact, in a considerable proportion of instances, remarkably easy to break the chain of contingencies, on which the phenomenon of intermittence in disease depends. Hence it will be necessary, before we can offer a decided opinion on the real value of this or any other new remedy as an antiperiodic, to have an amount of data which we do not yet possess. I am induced, however, to offer the following cases as a portion of the evidence on which our judgment on this subject must be founded.

Intermittent fever.—This disease is comparatively so rare in Edinburgh, that few opportunities have presented themselves to me for trial here. I regret this the less, that the evidence to be obtained for the treatment of the imported agues which we see here, is of a dubious character, from the facility with which in general these cases yield to treatment. The following are the instances in which I have myself tried it.

CASE 1. Mr C., aged 27, had been subject to ague in the tertian form in Canada. The disease came back during a visit to this country in May 1841, and the fits had recurred several times before I saw him. He had been previously treated with quinine, but disliked it from its irritating his stomach, and causing a feeling of fullness in the head. I thought this a good opportunity to try Dr Rodie's solution of sulphate of bebeerine which I had then in my possession.¹ The first dose, twenty-five drops, made him vomit, he having neglected, as advised, to take a dose of laxative medicine previously. After the bowels were cleared out, however, the stomach bore the medicine well. He continued to take the above quantity twice daily for five days, when the disease disappeared, and did not return during his stay in Scotland that summer.

CASE 2. ———, a labouring Irishman, aged 25, applied in June 1842, at the New Town Dispensary, for the relief of tertian ague, which he had contracted in North America. He was or-

¹ This solution, as prepared by Dr Rodie in his earlier experiments, is a thick dark-coloured solution of the sulphate containing some impurity. I do not know its strength, but in his printed letter, Dr Rodie indicated the dose as being from twenty to thirty drops. *Vide* a notice of Dr Rodie's discovery by Sir Andrew Halliday, Edin. Med. and Surg. Journal, vol. 44th.

dered the compound rhubarb pill, and subsequently sulphate of bebeerine¹ prepared from the seeds. Of this he took in solution forty grains, in doses of two grains thrice daily, and the disease yielded without his ever being confined to the house.

CASE 3. John Pollock, aged 74, residing in Bell's Wynd, Edinburgh, contracted ague about thirty years ago in Romney Marsh, Kent, and has ever since had annual recurrences of it in March and April, but not generally during the rest of the year. Last year at this time (March) he applied for relief at the Royal Public Dispensary, when he got Fowler's solution, and, as his schedule indicates, he took about 3ij in all, which cured him in a few days.

This year, 1843, the disease recurred as usual, and he applied at the Royal Public Dispensary again, where he was seen by Dr Bennett. The spleen was found much enlarged; he was ordered to take five grains of sulphate of quinine every four hours. He took twenty-five grains in twenty-four hours, which kept off the disease for seven days.

9th March 1843. On the 7th day from last attack the disease returned, and at my request Dr Bennett sent him to my lecture room to get sulphate of bebeerine. I gave it him in the same doses in which he had taken the quinine, viz., five grains every four hours. He took twenty-five grains in two days.

13th March. Has had no return of the disease since the day after commencing the bebeerine, except on the morning of the 11th, when he had slight shivering, which was checked by the last of his powders, and did not go on to the hot stage. He was ordered to take ten grains sulphate of bebeerine daily at noon.

16th. Has taken two of the ten-grain powders; no return of fit.

24th. No return since last powder.

I heard of him at a subsequent period, and he then kept quite free of aguish symptoms.

The value of bebeerine as a remedy, however, can be better judged of by its effects in the more serious cases of intermittent, as they occur in our colonies, and so far as it has been tried, there seems every reason to expect that it will be found to be an efficacious febrifuge.

The following is the statement of Dr Rodie himself, as quoted by Sir Andrew Halliday in 1835:—

“The trials that have hitherto been made of the sulphate of bebeerine, have been very limited; but they have hitherto been very successful. I tried it in a great many cases of intermittent and remittent fever, and found it equally efficacious with sulphate of quinine, nay, it frequently cured the fever when quinine

¹ Here and throughout this paper, when sulphate of bebeerine is mentioned, it is understood to be a sulphate containing both the alkalies of the bebeeru tree.

had failed. I have communications from many eminent practitioners in the West Indies, and they all assure me that they have found the sulphate of bebeerine as valuable a remedy, if not more so, than the sulphate of quinine, and that it had never produced any irritation of the stomach, nor that alarming symptom of deafness and determination to the head, which so frequently follows the exhibition of the quinine in large doses." (*Edin. Med. and Surg. Journ.*, vol. xlv. p. 547.)

For the following information and cases, I am indebted to my friend Dr Watt of West Coast, Demerara, to whose kindness also, I owe the bark and seeds with which I experimented. In a letter, dated 1st December 1842, Dr Watt writes,—“Some years ago Dr Rodie made a liquid sulphate or extract which was used in a considerable number of cases of intermittent fever, where quinine had not succeeded in checking the disease. He mentions to me five such cases where the bebeerine speedily effected a cure. In 1836, I gave it to a Miss J. M. with success, after both quinine and arsenic had failed. She was a perfect martyr to tertian, and had considerable enlargement of the spleen.

“The sulphate you sent to me, I tried in several cases of intermittent, and found from a scruple to half a drachm or two drachms sufficient for a common intermittent. The following cases were in white Portuguese immigrants, (field labourers,) twelve months from Madeira, and very subject to intermittent fever.

“CASE 1. Maria de Jesus, aged 38, subject to tertian. 21st November 1842. Has had two attacks at this time, one of them yesterday. She expects another to-day. Tongue clean. Ordered \mathfrak{z} i of sulphate of bebeerine in syrup now.

“30th. Has had no return of fever; says, through an interpreter, that the medicine made her ears ring and caused much sweating.

“CASE 2. Geneviva Joquina, aged 21, very subject to tertian. 21st November. Has not menstruated for six months, and is occasionally troubled with pains in the belly, which seems distended. Is sure she is not pregnant; she is a widow. Had ague and smart fever three days ago, and again to-day. Skin hot and dry; pulse 126. *Has frequently had quinine before with little effect.*— \mathfrak{z} i sulphate of bebeerine immediately.

“22d. No fever; complains of pains in belly; bebeerine rang in her ears, and she sweated all night.—To have jalap and calomel.

“23d. Medicine has not acted; *has a little fever to-day*; pain in the belly continues.—To have calomel and jalap, with salts afterwards, if required.

“24th. Purge yesterday acted but indifferently; no fever.—To

have ten grains of the sulphate of bebeerine with five grains of calomel, three times daily.

" 25th. The same.

" 26th. Purgatives repeated.

" 30th. Has had no return of fever since 23d. She has taken 80 grains of the sulphate of bebeerine in all.

" 30th December. Continues as last reported.

" CASE 3. Dom Ferreira, aged 25 years, very subject to intermittent fever in all its forms, quotidian, tertian, and quartan. Has it regularly every fortnight, beginning a few days before spring-tides.

" 28th November. Is now in the hot stage; had bilious vomiting during the cold stage, and states that his urine is yellow with bile; pulse 120.

" To have two grains of tartar emetic immediately. In the evening, Dover's powder and calomel, of each ten grains. To-morrow to take ten grains quinine (no bebeerine being at hand,) every four hours, until he has three doses in all.

" 30th. Having requested a purge yesterday morning, only two doses of the quinine were given. Has now severe ague; skin cold; teeth chattering; and moans very much; pulse 128; nausea and vomiting.

" As soon as skin becomes hot and stomach settled, to have ʒi of the sulphate of bebeerine, and to-morrow ten grains morning and evening.

" 2d December. Bebeerine affected his ears very much. This is his fever day, but has had no return, and is about to leave the hospital.

" 3d. Quite well; complains only of weakness."

The following case I have received from a medical friend in North America, to whom I sent some of the same sulphate which I had transmitted to Dr Watt.

" J. G., aged 20, has been two years and a half in the West Indies, and a year and a half in America. Has been of intemperate habits, but has been sober since 1st January. States that he suffered from ague in Trinidad and Dominica on several occasions. Complained on 27th March, having had three fits of tertian. This is the form under which he suffered in the West Indies, but he says this fit is the most severe he ever had, and that the present three paroxysms have been successively more intense. On the day of intermission, he had twelve grains of the sulphate of bebeerine. The subsequent fit was short,—next day he took nine grains, and has had no return. Complained a good deal of debility, for which he is taking a grain of the sulphate twice a-day. My formula was:—

R. Sulph. Bebeerin. . . . gr. xxiv.
 Confect. Aromat. . . . q. s. Misce.
 Ft. Pil. xvi. capt. ij. 4tis horis."

I am induced likewise to append the following case, communicated to Dr Watt, by Dr Blair of the Seaman's Hospital, Georgetown, Demarara. I give it entire, with Drs Watt and Blair's brief remarks upon it, which render any further comment unnecessary.

In a letter to me, dated 2d January 1843, Dr Watt says:—"In my letter to you of 3d December, I mentioned that I had sent the greater part of the sulphate of bebeerine to Dr Blair of the Seaman's Hospital, that it might be tried in place of quinine in cases of yellow fever. I have now the pleasure of enclosing you one case of yellow fever where Dr Blair substituted the bebeerine and found it to answer equally with quinine. Though much cannot be founded on a single case, yet taking it in connexion with its well-known effects in intermittent, as tested by myself, Sir Andrew Halliday, and others some six years ago, and again the other day, I have no doubt that the bebeerine will be found to be at least equal to the quinine, and successful even where the latter fails."

In his letter to Dr Watt, Dr Blair says:—"Accompanying this I send you a copy of the case extracted from the case book. It was genuine yellow fever merging on black vomit, and the fact of the recovery gives good encouragement for a fresh trial of the bebeerine. I must say, however, that during the last six weeks or two months, the cases of yellow fever in the Seaman's Hospital, have been fewer and much more tractable than for many months previously. . . . From the case reported, you will perceive that there is nothing to dread from large and frequently repeated doses."

"CASE, No. 4170. James Ferguson, aged 22, seaman, ex Unicorn. *December 7, 1842.* Was ill yesterday with headache; pains all over him, rigors, fever, and sweating; did not vomit; had some medicine given to him, which has purged him; at present is very ill; appears alarmed; hot moist skin; tongue furred, closely; edges red; eyes congested orange-yellow; pulse 90; pains in the body; nausea.—Enema; saline solution every hour.

1 P. M. Has vomited much biliary green fluid; headache easier; passed by stool undigested food and fœculent matter.—Wet sheet. Bebeerine, gr. xv. Oil in three hours.

4 P. M. Has less heat of skin, and no headache; has not vomited since; is copiously purged, passing the same peculiar fœces; tongue not improved, red at edges, furred thickly and brown; eyes more congested; pulse 90, full.—Bebeerine gr. x. every two hours.

8th *December 1842.* Vomited towards early part of night, and bebeerine was discontinued and chalk mixture ordered; fever continues still, but no headache; had an enema, followed by scanty stools; tongue loaded with ashy fur, edges vivid; no

nausea; pulse 88, full; abdomen distended, and tympanitic.—Ol. ricin. draught; afterward bebeerine.

4 P. M. Complains very much of the bitter taste of the powders, which make him spit much; has vomited part of the oil, and suspicious specks; copious bilious stools; skin cooler; no headache; tongue no better, furred and red; pulse natural; is inclined to eat something; has taken in all seventy-five grains of bebeerine, but has vomited at different times; no deafness or giddiness.—Bebeerine to be continued every two hours.

9th December 1842. Expresses himself as feeling just the same; nausea continues, with bitter taste; tongue blackened by the powders, which he at last refused, and would not take any more; has less heat of skin; no headache, or noise in ears; pulse full, 80; scanty turbid yellow stools; urine plentiful, brown, high coloured, with slight yellow tinge.—Discontinue medicine.

4 P. M. Vomited a little early this forenoon, but not since; feels better; tongue has improved, cleaning towards point; had a dose of castor oil, which has procured him scanty bilious stools; no morbid heat of skin; bitter taste in mouth gone; pulse natural; has had some chicken tea.—Bebeerine to be repeated every two hours.

10th December 1842. Took two of the powders, but vomited the last, and refused taking any more; taste bitter; passes very turbid, brown-coloured urine; tongue not improved since last report; pulse natural; no return of febrile symptoms.—Discontinue medicine. Beef tea.

11th December 1842. Improves still; has had no return of vomiting; skin cool and natural; languid capillary circulation; slight tinge of yellow; tongue cleaning; pulse 65, steady; turbid yellow urine.—Beef tea; 4 oz. of wine.

12th December 1842. Doing well; appetite still poor; no feverishness; tongue cleaning; bowels regular; pulse natural.

14th December 1842. Convalescent.

20th December 1842. Discharged cured.

The following is a *resumé* of the individual cases of intermittent fever in which I am aware that bebeerine has been employed, and in all with success, viz.;—Three cases in Edinburgh; one in North America; five in Demerara by Dr Rodie, and one Miss M., by Dr Watt, where quinine had failed, with the three cases detailed above by Dr Watt, in all nine cases in Demerara; making a total of all the cases 13, besides one of yellow fever.

Periodic Headache.—I have not yet been enabled to obtain sufficient data to justify me in confidently stating the results of the treatment of periodic headache by bebeerine. I believe, however, that a proper selection of cases of this complaint will form one of the best means by which, in this country, we can

test the antiperiodic powers of this drug, if we may judge at least from the facility with which we can observe the action of quinine in allaying this disorder. A large proportion of cases of periodic headache, however, are much more beneficially treated by a free use of cathartics, especially by croton oil in moderate doses, and it is chiefly in cases where the disease is connected with general debility, or where the cathartic plan has failed, that the use of bebeerine can be fairly tried. During the course of last year, I put eight cases of periodic headache and face ache under a cathartic plan of treatment, with a view to afterwards testing the powers of bebeerine, but in none of them did the disease resist so long as to require the tonic remedy. In one or two cases, however, where, from peculiar circumstances, the cathartic plan was inadmissible, I have tried it, and have been well satisfied with the results obtained. The following are instances:—

Mrs N., aged 30, the mother of two children, and nursing the second at present, delicate but active, and of a spare habit of body, has been suffering under periodic headache for the last two or three days. She had been treated by my father for a similar attack last year, which yielded to small doses of quinine. The fits of pain in the present attack commence about eleven A.M., and last till five or six P.M. Bowels are regular; tongue clean; otherwise well.—Was ordered to have a grain sulphate of bebeerine in powder twice daily during the intermission.

Next day, the onset of the attack was delayed for about an hour and a half, it was less violent throughout, and terminated earlier. The medicine was continued in the same way for three days, when, the fits of pain being no longer distinctly observable, she discontinued its use. She had a slight recurrence of the disease in the course of the ensuing week, for which she was ordered to resume the bebeerine as before, and to continue its use for about ten days after the disappearance of the pain. She was completely relieved, and has not now, for three months, had any recurrence of the disease.

Miss H., aged 25, of very delicate habit, with deformed spine, and suffering from chronic enlargement and congestion of the uterus, was seized with periodic headache after an attack of influenza last winter. As her symptoms partook much of the characters of debility and hysteria, she had, besides other treatment directed to the spine and uterus, a mixture of tincture of serpentaria and ammoniated tincture of valerian, from which she experienced some relief. The headache continuing, she had a grain of sulphate of bebeerine three times daily for a week, which relieved the headache and general debility very effectually, without producing any disagreeable symptom.

Besides the above cases, I have likewise used bebeerine with

success in a case of atonic dyspepsia, where it restored the appetite, and removed the bitter taste in the mouth and the uneasiness after meals; but as its action here presents nothing different from that of any ordinary bitter, and as the results obtained are not of the same decisive character as in ague or periodic headache, I have refrained in the mean time from extending my trials of it.

As regards the features which are characteristic of bebeerine as a therapeutic agent generally, I think that the above cases entitle us to consider that it is a marked antiperiodic and tonic, and consequently that there is good reason to believe that it may be applied to the same purposes for which the more expensive sulphate of quinine is employed.

Contrasted with quinine, I should say from what I have observed in my own patients, that it is not so liable to excite the circulation. Dr Watt, in one of his letters, writes to me, "I took ten grains of the sulphate on going to bed on 27th November, by way of trial. The taste was not more bitter than quinine, but continued much longer in the throat. It has a very astringent taste, causing the point of the tongue to have a leathery feel. I felt some fullness about the ears during the night, but no ringing. The same quantity of quinine would have made my ears ring for a whole night, and made me feel nervous next morning. After the bebeerine I had no nervous feelings whatever."

In a subsequent letter he says, "Whether or not the bebeerine affects the head like quinine, still remains a question. Dr Blair's patients said not—mine that it did. But as my patients were stupid Portuguese, and had to be enquired at through an interpreter, who put a leading question, they may have answered yes, from politeness."

I may state that the astringent taste observed by Dr Watt, is characteristic of the salts of bebeerine, and is in no way connected with any adherent impurity, nor does it confer on the sulphate any astringent action on the bowels. On the contrary, in most of the cases in which I used it, the bowels have remained regular without medicine.

It is unnecessary to say any thing further here, as to a secret medicine, extensively circulated under the name of "Warburg's Fever Drops," and which, as I have elsewhere stated, I believe to be a tincture of bebeeru, probably of the seeds. Like any other preparation of bebeerine, it may answer for treating intermittent or remittent fevers; but the supposition that it is applicable as a specific remedy to such a disease as our common continued fever, is a fallacy too obvious to require comment.



