

the British Empire, and has traditions envied by all. For generations it was the last word in education. Its graduates are found in every part of the globe, and they display an affection for their Alma Mater and an admiration for their teachers which in my experience is unique. For years I appointed as my house-surgeons Edinburgh graduates, not because of their practical knowledge, which was often deficient, but because they had been carefully taught how to observe. There were many men who had come into closer contact with their patients, who had been given more responsibility, but for receptivity of mind and the ingestion of new ideas the Edinburgh student always excelled. In early days, when views I held were less popular, I knew so well their incredulous look, and how closely one had to reason in order to convince. I recall the case of one man, now a distinguished orthopaedic surgeon and a close friend, who, after following my rapid flight around a ward, pushed into the board-room when I was putting on my coat, leaned against the table, and almost angrily pelted questions at me; and when in a timid way I tried to answer him, he clinched all argument by an unanswerable sentence: "This is not Edinburgh teaching." Edinburgh graduates, over and over again, have complained to me of their lack in orthopaedic training even up to recent years.

This is not worthy of a university of so singular a reputation, and which has always displayed an almost fatherly solicitude for the efficiency of its graduates. Now that it is about to make up for its deficiency, I commend for its consideration a scheme such as that which I have advanced. When the work starts let it begin on good lines for defects soon become stereotyped, and are always difficult to amend. At St. Thomas's Hospital in London they have started their department on progressive lines. At King's College in London, also, a distinguished orthopaedic surgeon runs his unit, and has been granted forty beds together with the treatment of fractures. I would like to see the new Orthopaedic Department at Edinburgh add lustre to the glorious traditions of the University.

With the generous gift, which is soon to be expended on a new country hospital, what a magnificent prospect is opened up! It can be started on the most modern lines, with an unequalled equipment. I trust the children will be allowed to live in the open air. Surgeons might renew their youth by working in such ideal surroundings, and the child have the benefit of skilled supervision from first to last. The chronic case could be educated, trades taught him, and a spirit of joy and hope would reign. Those who minister to it in any capacity will realize that they are not only doing a personal and kindly service, but one of invaluable importance to the State. I should rejoice to see such an institution become a national centre for the prevention and cure of cripples in Scotland, spreading its influence over the whole of the land, and conducting an educational and reconstructive campaign of inestimable service to mankind.

REFERENCE.

- ¹ BRITISH MEDICAL JOURNAL, October 11th, 1919, p. 457.

A PRELIMINARY NOTE ON THE USE OF VITEX PEDUNCULARIS IN MALARIAL FEVER AND IN BLACK WATER FEVER.

BY

LIEUT.-COLONEL J. C. S. VAUGHAN, I.M.S.,
LATE CIVIL SURGEON OF RANCHI.

HAVING noted the occurrence of a large number of cases of blackwater fever, and also of very severe malignant malaria in the Ranchi district, I made inquiries as to whether there were in this locality any plant with virtues similar to those of *Aphloeia theaeformis* (which is used in these conditions in Madagascar), and was informed that there is such a plant actually used by the aboriginal tribes, and that blackwater fever does actually occur among them was evident enough from the clear description of its leading symptoms given me by one of themselves, who sent me samples of the leaf of the plant used.

This plant is locally known by various names:

1. Hindi Minjurgorwa, Chhagriamba, Charaigorwa, Nagheni, Nagball,
2. Uraon Eratakha.
3. Kol Simjanga.
4. Bengali Baruna, Goda.
5. Assamese ... Oasi.
6. Santali Badumarak, Bhadumarak.
7. Cachari Hila Anwal, Krawra (Pran).
8. Garo Shelangri.
9. Navaladi.
10. Burmese ... Kyetyo.

Of these vernacular names, numbers 4 to 10 have been taken from J. S. Gamble's *Manual of Indian Timbers*, 1902 edition, p. 541. The superintendent of the Royal Botanic Garden at Sibpur has identified the plant botanically as the *Vitex peduncularis* Wall (variety *rozburghiana*). I find it mentioned also in Kirtikar's and Basu's *Indian Medicinal Plants*, Part II, page 1001, and figured, but not very accurately, in their plate No. 741. They give its habitat as "Bihar at Parasnath, Eastern Bengal, and Khasia Terai," and state that "in Chutia Nagpur the bark is used for making an external application for pains in the chest (Rev. A. Campbell)."

The plant is fully described in the two works mentioned above, and in Haines's *Forest Flora of Chota Nagpur*. It is only necessary to add that the leaf characters vary somewhat with the age of the plant, the petiolar expansion on the leaf stem being very inconstant in the older specimens. The aborigines state that there is a variety of vitex with a dark-coloured root—they call it a "red root"—and that this is better to use than the usual pale-rooted plant, which, however, is the only kind I have been so far able to obtain and to use.

My information is that it is used in various ways, chiefly as an infusion of the leaves or of the root bark or young stem bark, in fever of malarial type, and especially in blackwater fever. As to the dosage, I followed in the first instance, since October, 1919, and in the main still follow, what amounts practically to the original directions given me by my Uraon informant as regards the method of use. These are as follows:

Two ounces of the leaf used fresh, or dried in the shade, is dropped into 40 oz. of boiling water, and is boiled in it for five to ten minutes, and then allowed to soak in the water in which it has been boiled, for an hour at least. The resulting infusion, amounting to about 40 oz., is poured off the soaking leaf and given as required in doses of about 8 to 10 oz., distributed over twenty-four hours, or given over the day only, the patient resting all night undisturbed. The infusion is of about the colour of strong cold tea and not unlike it in taste, and is given sweetened with a little sugar to taste.

As soon as we decided by the results that the infusion was quite a useful preparation, we attempted to prepare a concentrated infusion on the lines of the infusion gentianæ compositum (conc.) of the *British Pharmacopoeia*. This has also proved useful, but we found it less reliable than the simple infusion of 1 oz. to 2 oz. of leaf yielding 40 oz. of infusion with plain water. With further experience we found it in certain cases necessary to give larger doses, and to avoid too great a volume in each dose we prepared a 40 oz. infusion from 1, 2, and 4 oz. of leaf, and we called these, for easy reference, infusions of 1 in 40, 2 in 40, and 4 in 40 strengths, and used these as required.

As to results, generally speaking, in malarial fever, we have in almost all instances identified the parasite of malaria before commencing the treatment. This preliminary has only been omitted in a very few of the cases on which this paper is based, and these latter have been, I think, quite undoubted cases of malaria also. The results, as a whole, show that, whereas there are cases that will quite readily yield to a 1 in 40 infusion, there are others that require a very much larger dosage. This may be due to, perhaps, the fact that we have not so far been able to standardize dosage, as the active principle has of course not yet been identified. The actual experience with the use of both the infusion and the concentrated infusion has been that, whereas a proportion of cases have quite readily yielded to a dosage based on the infusion of 40 oz. of infusion from 1 oz. of leaf given over twenty-four hours of administration, and have yielded in some cases in twenty-four hours and in others in the course of seventy-two hours, there have been other cases which have not yielded even in seventy-two hours, but which have yielded at once when the dose was doubled or considerably increased by either giving a larger actual dose of the 1 oz. to 40 oz. infusion, or by using a very much stronger infusion, even up to one of 4 oz. of leaf to the 40 oz. infusion, and there are others which have been even more obstinate. The results, however, have been uniformly encouraging.

The drug seems to have no toxicity at all in the dosages

so far employed, and children have actually been given relatively very much larger doses; indeed, practically the same actual dose as adults, and there are no disagreeable after effects. I append below short notes of some of the cases treated.

As regards the use of vitex infusion in blackwater fever I have so far, naturally, not had much opportunity. I sent out some of this leaf (before we had had it identified) to certain officers of the Forest Department in response to a request from one of them, and it was used in simple infusion in a case of blackwater fever occurring in a forest ranger, and the report is given below charted out. His urine cleared to a natural colour after nine doses of infusion of 1 oz. of leaf to 40 oz. of water given over forty-eight hours, and he made a complete recovery. I also sent some of the leaf to Dr. A. T. Williams, of Kettelah in Assam, recommending him to try it in blackwater fever, and he had the good fortune to get a very severe case which is referred to below. His telegram to me regarding this case sums it up in the words, "Bad case, ten pints infusion completely cleared specimen, recovery." This infusion was also of 1 oz. of leaf to 40 oz. of water.

I would next briefly review some of the cases treated with the preparations so far used made from the leaf.

(A) MALARIAL FEVER.

Case 1.—Sister Sr., an Indian nun, contracted malaria in Rengari, a very malarial locality, in July, 1919. Had been given quinine freely, which checked the fever, but it always came on again at a few days' interval. Admitted in the latter part of October and treated with gr. 5 quinine sulphate tabloids for some days with practically no effect, and with quininism following. The temperature on October 26th, 1919, was 102.2°, on October 28th, 100°, when malignant tertian parasites were found. Infusion vitex 1 oz. to 40 oz. infusion, given in the afternoon and repeated four-hourly, and continued until November 3rd. No fever from the morning of October 28th; observation continued until November 7th. No fever all this time and parasites absent from November 4th.

Case 2.—Timothy, native Christian. Had suffered for several days from fever and had kept at work; treated with 8 gr. quinine tabloids t.d.s. for three days. No effect. Blood examined, malignant rings found; put on infusion vitex 1 in 40, and fever absolutely ceased. Kept in hospital for nine days and on treatment, during which time had no fever; discharged. Under observation for fourteen days. No fever.

Case 3.—P. B. B., Bengali male. Admitted on October 30th, 1919. Temperature 104°. Benign tertian. No fever on October 31st or on November 1st. Fever recurred November 2nd, parasite found on the 3rd, and patient put on infusion vitex 1 in 40. No more fever. Under observation for over ten days.

Case 4.—Sister St., Indian nun from Rengari. Fever since July. Repeatedly treated with quinine. The temperature on November 5th, 1919, was 104°, on the 6th 102°, and on the 7th 99°. Malignant tertian parasite found. She was not admitted to hospital, and took at the convent vitex infusion 1 in 40 in half quantities only, with practically no effect until November 15th, when she was admitted to hospital and put on full dosage. The temperature after this gradually and steadily came down, and, with the exception of one rise on November 20th, to 103°, which fell next day to normal, she had no more fever, and has since made a good recovery. In this case it was clear that the half quantity of infusion was too small a dose.

Case 5.—European male adult. Had frequently had severe malaria. Present attack began on October 28th, 1919, with temperature 104°, when he treated himself with aspirin and quinine—the latter in doses of 24 grains daily—until November 5th, on which day blood showed malignant tertian parasites, and temperature went to 105°, and quinine was discontinued. On the 6th put on infusion vitex conc. ½ oz. four-hourly. Temperature rose again to 105°, and on 7th to 105.4°. On the 8th he was put on 1 oz. of the infusion vitex conc. four-hourly, and temperature fell to 103.6°. On the next day he was put on the simple infusion 1 in 40, and the temperature dropped to normal, and has not risen since.

Case 6.—Mohammedan male, aged about 36. Fever began about December 4th, 1919, and rose on 6th to 103.6° when he came under treatment of an Indian colleague and was put on a fever mixture without quinine. On the 7th the fever fell to

normal, after which he was given quinine sulph., gr. 20. The same evening it rose to 103° and continued at this level till the evening of the 8th, no further quinine being given. On the evening of the 9th it rose again, and on the forenoon of the 10th he was in delirium. I examined the blood on the afternoon of the 11th and from 6 p.m. of that day, malignant tertian parasites having been found, he was put on the 1 in 40 infusion of vitex leaf. By this time he had been continuously in mild delirium for some twenty-seven hours and his temperature was 103.6°. By the morning of the 12th he was free of delirium and of fever and has had no return of high temperature. Vitex was stopped on the 14th. I saw this man again some four months later. He had had no return of malaria during this period.

Case 7.—Hilda, Christian aboriginal, aged 15. Had fever at home on December 13th and 14th, 1919. Admitted with temperature 104° on the 15th. No quinine history. On the 16th temperature 104°. Malignant parasites found next day, and patient put on vitex infusion 1 in 40. That evening temperature 102°; on the 18th, 100.4°, on the 19th, 98°, and normal since.

Case 8.—Anandini, Christian aboriginal girl, aged 9. Had had fever for a long time off and on. Admitted to hospital with no quinine history and with a temperature well over 106°. Malignant parasites found on December 16th, 1919, and patient put on infusion vitex conc. 2 drachms every four hours. Temperature on 16th 102.4°, on 18th 98.4°, on 19th 100°, and normal since. Vitex continued until December 22nd; no fever since.

(B) BLACKWATER FEVER.

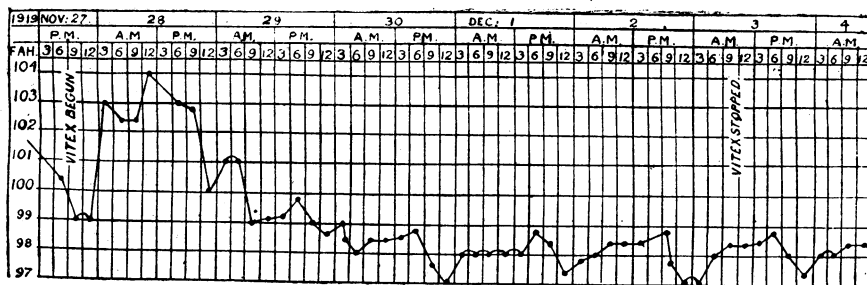
Case 1.—Dr. A. T. Williams's first case was that of a European tea-planter, a young man of very good physique. Had a previous attack of blackwater fever in 1918; no details available. Then had six months' leave to Australia; back in India in February, 1919. Always neglected quinine prophylaxis and had repeated attacks of fever, generally feeling below par. Had lately been taking a tonic, and felt fitter. On November 16th, 1919, woke up feeling exceptionally fit after a week of intermittent fever (malaria) during which he had had a maximum temperature of 104° with depression. At 1.10 p.m. passed about 3 oz. of port wine coloured urine.

At 2.45 p.m. passed another 6 oz. of the same, and had a rigor and went to bed. Administration of the infusion of vitex leaves 1 in 40 was immediately started. He took it readily and quite liked it. In the evening urine was almost black. By 11.15 p.m. retching and vomiting. At 11.30 p.m. rigor, and temperature 102°, cramps in fingers and legs. No sleep. Colour bad; circumoral pallor. November 17th: Deep icterus—one large natural stool, pasty; persistent retching and vomiting all day, neither the infusion nor anything else being retained in the afternoon. Iodine, acid. hydrocyanic, dil., mustard plasters to epigastrium, and a blister over course of vagus in neck were all tried without success; thirst excessive, mouth very dry. Cramps; vomited matter scanty and "coffee grounds." Rectal salines given copiously. Pulse kept astonishingly good. Total urine of twenty-four hours was 57 oz. of deep claret, almost black, colour. Rectal feeds from the evening. November 18th: Prostration excessive. Champagne, salines and food by rectum. Three six-ounce feeds retained in twelve hours. Vomiting seemed checked by further acid. hydrocyanic, dil. Urine began to clear noticeably about noon and continued to clear through the day. Very restless at night. Morphine gr. ½, thirst severe, sleep very broken till 3 a.m. of 18th-19th, and then good till 6.30 a.m. of 19th, November 19th: Marked improvement, no vomiting, resting quietly, thirst less, urine steadily clearing and almost clear by night. Secretion of urine less. November 20th: Urine quite clear. Went right ahead from this onwards, and never looked back.

The urine began to clear forty-eight hours after the infusion was started and continued to clear in spite of a rise of temperature on November 18th. Nothing was given except the infusion. The total amount drunk was approximately 10 pints, but the first five pints were only half strength.

Case 2.—Dr. Williams's second case was that of a Bengali clerk who is alleged to have had two previous attacks. When first seen he had almost complete suppression of urine and severe vomiting. He took about 2 pints of the infusion and refused to touch any more. Everything was tried to get his kidneys going, but without effect. A catheter specimen, obtained about six hours before death, was much clearer than the first lot seen. (These cases of Dr. Williams's are given practically in his own words.)

Case 3.—On November 22nd I received a telegram from the Forest Officer at Manharpur, stating that a forest ranger was down with blackwater fever and asking for vitex leaf (which had not then been really identified botanically). I sent some at once, but it was not until the evening of the 27th that the patient received them. Administration of vitex infusion was



Infusion of vitex 1 in 40 was given from 8.15 p.m. on November 27th, and continued regularly every four hours till noon on December 3rd, when it was stopped; no other drug was employed. The urine, which was blackish-red on November 27th, began to clear on November 28th, became natural in colour about 6 p.m. on November 29th, and continued so.

begun at once and continued four-hourly. The urine cleared in thirty-six hours and the temperature dropped.

Besides the cases noted in this paper we have treated with vitex in Ranchi some 60 cases of malarial fever, and we have under treatment a case of blackwater fever which occurred at Rengari in a European nun.

This patient had recovered from the original attack of blackwater fever under treatment with *Aphloea theaeformis*, and was brought into Ranchi with her urine still very dark and with abundance of bile in it, and obviously on the edge of a relapse. She was a very severe case to start with, and was in a very critical condition on arrival here. Under infusion of vitex (2 in 40) her urine absolutely cleared in thirty-six hours, her fever came down, and she has made a very good recovery so far.

Now to sum up the results generally. It must, in the first place, be strictly borne in mind that we are but at the very beginning of a very important investigation. It must not be forgotten that in the treatment of malarial fever with quinine—taking the average results of all practice—we get very varying results. There are cases treated with quinine which yield at once in the most gratifying fashion very shortly, if not immediately, after the commencement of treatment. There are others which yield after a week or so, others which persist longer, and others, again, of obstinate types which yield only after the most drastic treatment, or after prolonged treatment, and we are tempted in some few of these latter to ask what the real effect of quinine has been, and whether it has really had any effect. We are accustomed to regard quinine as the specific for malaria, and in prolonged cases yielding only after an obstinate fight we say in practice that quinine has succeeded only after a determined exhibition of it. I am referring now to cases of undoubted malaria. Now, with vitex my experience has been that we have had the same series of varying results—namely, cases that yield at once, others which yield after a short period, others which persist, and others which yield only after a prolonged struggle; and we have had with vitex no experience at all comparable to that of the giving of alkaloids of quinine hypodermically or by intravenous injection. All this, as regards quinine cases, is familiar to most men practising in malarial countries.

There is, however, one very important point of difference at this stage of our investigation, for with quinine we have the finished article worked out to a nicety. The original article was a wild South American forest plant, and now we have all its alkaloidal products differentiated, and the alkaloids have doses that are standards unto themselves and recognized as such. We know the clinical standard value of each of them, and when we come to use them we more or less know what we are dealing with—more with reference to the chemical constitution of the drug we are using, less with reference to what I may perhaps allude to as the coefficient of virulence and resistance to drugs of the particular malaria under treatment. With these two opposing factors we get our varying clinical results with quinine and its allied alkaloids—that is to say, with a series of drugs which have something of a recognized clinical standard value of efficiency. On the other hand, vitex is at present in the stage approximately in which cinchona was when first discovered in the Peruvian forests. The cases I record are the very first fruits, and the singular value of these first observations lies in (1) the extraordinary parallel in the types of the results of treatment with quinine on the one hand and vitex on the other; (2) the extremely encouraging general result of cure which, so far, has practically been as uniform as with quinine. It must be borne in mind that vitex is now in the position in which cinchona was when first discovered—a drug used only in the crudest way by aborigines. The way in which I have so far used it is the aboriginal method. Its results have been good.

I would next point out certain further details and differences.

1. Quinine is extremely bitter; vitex is not so.
2. Quinine produces many troublesome effects and after-effects which I need not dilate on, and is toxic. Vitex produces nothing approaching quinism, and seems to be absolutely non-toxic, and, so far, has given no unpleasant after-effects.
3. Quinine is known to have definite depressing effects on the heart and circulation; vitex, after its use, produces a feeling of well-being, is mildly stimulant, appears to have no depressing effect on the heart, and has a clear diuretic effect.
4. Quinine is oxytocic, and there are dangers in giving it in pregnancy. Vitex, as far as our experience of it goes, has apparently no such dangers attending its administration.

It would appear, therefore, that in *Vitex peduncularis* it may yet be found that we have a most valuable remedy for malaria, and that all that is needed is to work out its properties in detail.

I would add one interesting point which, however, needs investigation. Mr. McLeod Smith, the subdivisional officer of Simdega, tells me that during the last outbreak of influenza in 1918-19 those villages that were accustomed to use this plant for malaria used it in the influenza outbreak and had a mortality definitely lower than those other villages which did not use it. This is but a loose observation from a layman, but acting on it I have so far used it in a few cases of obvious influenza which have recently occurred, with a complete relief resulting after three doses in twenty-four hours of the 2 in 40 infusion of leaf. I give this for what it may be worth as an isolated observation, but I shall push it if opportunity offers.

The root bark and stem bark are also about as useful as the leaves for all purposes for which the latter may be used. This is to a large extent confirmed in my experience.

The infusion of leaves and bark is said to be useful in cystitis. I have found it so in one case. I certainly find it an excellent diuretic.

In vitex it may be that we shall find active principles which will give us all the power of quinine in malaria without many of the dangers and drawbacks of quinine and its allied alkaloids, and we have the most important additional clinical value of this plant in blackwater fever, the scourge of our forest areas and of the submontane tea districts. If future investigation confirms the value of this plant in malaria, it must be strictly preserved in the forest areas of the country. It is widely distributed, perhaps, but none too abundant where it occurs. One may find a hundred plants on a single acre, and travel over miles of forest before he comes across another plant.

Finally, I must express my obligations to all who have helped me in this investigation so far; to Kuril Kerketta of Kuruskela in Ranchi District, my aboriginal informant, who put me on to the leaf and plant; to Mr. David McLeod Smith, subdivisional officer of Simdega in this district, for his keen all-round help, and for much information as to the aboriginal and local names of the plant and its local uses, and for collecting the leaves and bark; also to Mr. E. Durham-Waite for the first clear botanical specimens put up; and to Miss McDonald and Dr. Arit of the Society for the Propagation of the Gospel Mission Hospital, and to Mother Henriette of the Ursuline Convent at Ranchi, and Assistant Surgeon Garib Das Gupta at Ranchi, and Subassistant Surgeon Khudiram Mukerjee of Simdega, for all the help they have given me in various ways in clinical work, and in collecting leaf and bark.

DETAIL OF PREPARATION SO FAR USED.

1. *Infusion of leaf*—in three strengths, as detailed in the foregoing notes—1 in 40, 2 in 40, 4 in 40.

2. *Concentrated infusion of leaf.*

| | | | | |
|------------------|-----|-----|-----|-----------|
| Powdered leaf | ... | ... | ... | 8 oz. |
| Sp. vin. rect. | ... | ... | ... | 2½ oz. |
| Aqua chloroformi | ... | ... | ... | ad 12 oz. |

Make up to 12 oz. with aqua chloroformi after a week's percolation; and straining off liquid. Dose: Half to one ounce every four hours. Found as good as leaf infusions (1).

3. *Fresh stem bark extract.*

| | | | | |
|------------------|-----|-----|-----|-----------|
| Ground bark | ... | ... | ... | 4½ oz. |
| Sp. vin. rect. | ... | ... | ... | 6 oz. |
| Aqua chloroformi | ... | ... | ... | ad 30 oz. |

Percolate for a week, and make up liquid with aqua chloroformi to 30 oz. Dose: Four to six teaspoonfuls every four hours. Found about as effective as leaf infusions (1).

DILATATION OF THE HEART.

BY

D. W. SAMWAYS, M.D., D.Sc., M.R.C.P.,
MENTONE, FRANCE.

THE mechanical disadvantages under which a dilated heart labours are not likely to be adequately realized till the influence of size on the working conditions of the heart is more fully grasped. The heart is commonly thought of as so much muscle, better or worse nourished, and better or worse controlled; whereas the factor of the size of the chamber it encloses is largely overlooked, though of immense importance to its working.

Now, if four lines be drawn from the centre of two concentric spherical surfaces through both surfaces, as in the diagram, the diameter of one sphere being double that of the other, the area enclosed between the points of passage of the first surface will obviously be but one-quarter of that for the second.