is covered with a sheet of aluminium. This arrangement allows a slow, steady heat, which can be regulated and controlled with ease and safety; besides, Mr. Greville (31 and 32 Upper Berkeley Street, London, W.) has constructed every variety of bath, full length as well, so that there is no part of the body which cannot be successfully treated. All his chambers are so light they can be moved about as easily as one moves a chair.

CASE I.—M., aged 67, has been afflicted with gout for over twenty years. His attacks of late have been more and more severe and prolonged, lasting for six and eight weeks, in defiance of the most heroic treatment; otherwise strong and healthy. Saw him on August 16th, 1898, unable to move; could not turn in bed; hands, wrists, elbows, feet, ankles, and knees full of acute gout. August 28th: Persuaded him to have first Greville in his bedroom. Both legs were kept in for forty-five minutes; temperature 300°; neither pulse nor body temperature were affected. 29th: Had his second bath at 8 A.M. That afternoon I found him sitting up dressed. 31st: Was able to go to Royal Baths in chair, a distance of three-quarters of a mile. Could walk with assistance, was free from pain, had good night's rest. On September 3rd he went home, and since that date has been for the most part confined to bed and his room. I mention this case to show the rapid action of the bath and great and immediate relief afforded. Had he continued under the treatment I feel assured he would have been in a very different condition from the one he is in at present.

CASE II.—F., aged 75, always enjoyed the best of health, but for many years has suffered from rheumatism in both hips and knees. Now the hips are very stiff and painful; the knees swollen, painful, and almost incapable of any motion. This condition has been gradually increasing. Has been at Buxton, Bath, Aix-les-Bains, and other spas, without benefit. Ordered sulphur water internally, and thermal sulphur baths alternate with the Greville. At the end of a fortnight was much improved. In another fortnight could rise from chair with ease, and with assistance walk a little way. Pain in hips entirely gone, but still suffers in both knees. She felt perfectly satisfied that she had received more good from Greville treatment than all she had undergone previously.

CASE III.—M., aged 73, never had gout or rheumatism, but been very seriously ill with liver attacks. For some months has suffered from pain outside of left foot, with cramp of toes. This was followed by acute pain in outer and inner side of leg below knee, the pain coming on during the night whilst in bed, preventing sleep entirely. Had been under treatment for this without the least good following. The first Greville gave relief, and each following did more and more; after six the pain was completely gone, also the pain in foot and cramps. Six weeks have passed; there is no return, and he can walk as well as any man of his age.

CASE IV.—M., aged 60, twenty years ago showed very distinct symptoms of locomotor ataxia; this increased, exhibiting all the usual signs for two years, then became stationary, and has thus remained: is very gouty, bilious, and never entirely free from eczema; can hobble for one or even two miles with two sticks. Six months before I saw him he noticed his left leg begin to swell, and gradually this increased until it was exactly twice the size of its fellow. The swelling went from the foot to the body, was uniform, not in any way discoloured or painful, did not pit on pressure, or cause any inconvenience. After he had three Greville baths slight changes began to show themselves; the limb perspired freely for the first time; he felt something give way, and after three more baths the limb was the same size as the other, and has continued the same ever since. The symptoms, I believe, arose from block of lymphatic vessels. The limb looked and felt just as in phlegmasia dolens. Three months have elapsed and the cure continues.

CASE V.—M., aged 63, of very gouty family; has been subject to attacks for twenty years at least; for last five years hands, wrists, and fingers have been gradually getting worse. Rheumatoid arthritis (?); great disfigurement, pain, and helplessness. Often cannot do a thing for himself, sign his name, or hold his paper. Has been a regular visitor to Harrogate, and always found great good from the waters and baths. This year combined these with the Greville. After the first, right wrist felt softer, and showed signs of decrease in the wrinkled skin; pain much less. After the third could move fingers and wrist; can write and hold his book. He had altogether nine baths, and when he left volunteered the statement that his hands were better than they had been for years.

CASE VI.—M., aged 70. Enjoys perfect health, but for eighteen months has suffered from severe rheumatic pain in muscles above right elbow and in the joint itself; pain extends half-way up the arm. Has been treated thoroughly for it, and gone to several spas for douches and massage. After second Greville found considerable ease, and three more completely rid him of the pain. I saw him a fortnight ago, and he still felt all right.

CASE VII.—F., aged 31, delicate looking; gout very prevalent on father and mother's side; has no complaint except pains in both hands and feet. Pain in feet so great as to be unable to walk any distance; pain in hands incapacitates her from doing anything with them. There is no swelling in either hands or feet; occasionally the latter are reddish. Has been treated for gout during the last two years, but without benefit. She was sent to me by her doctor, in order to have a course of water and sulphur baths; these she had regularly for three months without change. I then tried the Greville, and she had six, temperature going up to 320°, without the slightest relief. I heard from her six weeks after she left, and she remains in the same condition.

CASE VIII.—F., aged 37; right shoulder swollen, painful; cannot extend arm at all, or raise hand to head, any attempt at either causing great suffering. This has been going on getting worse for the last three years, shoulder-joint measuring from above underneath armpit 1 inch larger than the left, and when you move the arm in any direction the scapula moves, shoulder is fixed; had gone through the usual course of treatment, including baths, galvanism, massage. After thirteen Grevilles, beginning at 300° and going up to 375°, the swelling gone. Can stretch out arm, raise it with ease to head, place it behind her back, and write for short time comfortably. I name this case whilst still under treatment, because it was pronounced incurable before she came to me.

The following cases are reported by Dr. James Myrtle:

CASE A.—M. E., aged 48. Sciatica, affecting the left leg. Had a full course of sulphur waters and baths before the Greville bath was introduced. He then stayed, and had three of them. During the six weeks he had been here he slowly improved in his walking power, and also had distinctly less pain. His was the first case in which the Greville bath was used. He saw me after his third bath, when I said, "Well, how are you?" He stooped down without fixing his knee, pretended to loose his boot, drew himself up, and said, "I have not been able to do that for seven years." I saw him six weeks after he left the place, and he told me the improvement still continued, and that had he any return he should go to London and have a few more baths.

CASE B.—T. B., aged 46. Case of acute double sciatica. This gentleman was introduced to me by Dr. Blason, with the object of trying the Greville bath. At the time I saw him he was quite unable to get up from his chair without great effort. When up he was unable to move without crutches. He had been in this state for nine weeks. I ordered a bath, and saw him crawling with the aid of a friend and crutches down to it. When he left the bath he walked a distance of three-quarters of a mile to his hotel without the use of crutches or stick, and was able after that first bath to discard the use of his crutches, and after three or four more walked freely and well without a stick. He had a course of twenty-one baths, and walked daily five or six miles at a stretch with comfort, all his pain in both nerves having totally disappeared.

CASE C.—W. S., aged 42, consulted me as to the advisability of taking these baths on account of locomotor ataxia of three years' standing. When I first saw him he was unable to walk 150 yards without resting and with the aid of a stick, and could not go up any steps without the assistance of a rail or stick. He suffered markedly from diplopia. I advised him to come to Harrogate and try the effect of these baths. He had a course of twenty-four at the rate of four a week, and when he left the place was able to walk four miles at a stretch, and could mount the stairs of a three-storey building in comfort. His sight, also, had greatly improved. He told me that after his first bath he was able to put his hands behind his back and dip his head in a basin of water, a thing he had not been able to do for nearly three years. The improvement in this case still continues, although two months have elapsed since he took a bath.

CASE D.—E. G., a keen sportsman, aged 66, consulted me in September about a gouty stiffness in both his hands, the wrists, and joints of the fingers. I advised him to try the effect of the Greville bath. He had a course of six, and left with perfectly free movement in all the joints previously affected. This improvement, he told me at the end of last month, is still maintained.

CASE E.—Mrs. I., aged 55, suffering from chronic rheumatism, affecting the muscles of the calves, the knee, and ankle-joints. She had a full course of the sulphur water and baths, with marked improvement so far as muscular pain went, but the joints did not answer so readily to the sulphur bath as is usual in most cases. I therefore tried her with four of the Greville baths. The swelling and stiffness decreased rapidly with each bath, and she left the place, as she said, completely cured. The extraordinary relief from pain which all my patients have expressed after the first of these baths, and that this relief is maintained during the two or three days intervening between each bath, is to my mind one of its most remarkable features.

FILARIA DEMARQUAI IN ST. LUCIA, WEST INDIES.

By OTHO GALGEY, M.R.C.P.I.,
Colonial Assistant Surgeon.

IN the BRITISH MEDICAL JOURNAL of December 25th, 1897, Dr. Manson draws the attention of the profession to the different varieties of the filaria sanguinis hominis found in the blood of man in tropical countries, and enumerates six embryo nematode worms discovered up to date. These are filaria nocturna, filaria diurna, filaria perstans (Africa), filaria Demarquai (St. Vincent), and two possibly new filariae recently met with in Demerara, which he grouped together under the provisional name, filaria Ozzardi (British Guiana). These minute worms present such different characteristics under the microscope that Dr. Manson and other authorities believe them to be distinct species.

Filaria Demarquai is described in the same article, and Dr. Manson states that he found it only on blood slides sent to him by Dr. Newsum, of St. Vincent.¹ He failed to find it in blood forwarded to him from St. Kitts and Montserrat. Dr. Daniels, in his recent article in the *Journal of Tropical Medicine*, confirms this by saying: "I have not found the filaria Demarquai in any of the West Indians (102 cases), including 6 from St. Vincent. These statements prove that F. Demarquai is not universally distributed throughout the West Indies, and that not very much is known respecting it; in fact, the only literature on the subject which I have been able to discover are the articles above mentioned in the BRITISH MEDICAL JOURNAL, and a short reference to it in the *Manual of Tropical Diseases*, also by Dr. Manson.

The study of filariasis is exceedingly interesting and absorbing, and, therefore, the discovery of another habitat

where one of the new varieties of bloodworm is found to be prevalent will possibly prove of some interest to those engaged in the study of the geographical distribution and pathology of these nematodes.

Filaria Demarquaii is to be found in the blood of many natives of this island. I have several beautiful specimens of the worm. It is much smaller than *filaria nocturna*. The body is long and slender, with a sharp tapering tail. The head is blunt, and on a few specimens I have noticed a small fine filiform projection, like the sharp tongue of a serpent. The appearance of *filaria Demarquaii* under the microscope is exceedingly graceful and attractive, contrasting favourably with the thicker and coarser *filaria nocturna*, at least of the West Indian variety. The size of *F. Demarquaii* varies in different individuals, and sometimes even on the same slide worms of several sizes are found. All have the characteristic sharp tail, but some are exceedingly long and slender, others medium-sized, and others again very tiny, approaching in size *filaria Ozzardi* (British Guiana), specimens of which were kindly forwarded to me by Dr. Daniels. From the difference in bulk observed in the sharp-tailed worm (which, after all, may be merely the result of different modes of preparation) I am inclined to believe that all are *filaria Demarquaii*; that is to say, that the *filaria Demarquaii* of St. Vincent, and that discovered by me in St. Lucia, and the sharp-tailed form of *filaria Ozzardi* (British Guiana) are identical. This is a point of extreme importance in the study of these interesting blood worms.

Filaria nocturna and *filaria diurna* observe a regular periodicity, one being present in the blood during the night only, and the other being found in day blood solely. *Filaria Demarquaii* has hitherto been supposed to be present in the peripheral blood both day and night, and therefore has no periodicity. Some of my slides tend to disprove this, as several taken in the afternoon contain no embryo worms, whereas those procured at night from the same individual show many specimens of *filaria Demarquaii*. Therefore, it is legitimate to conclude, *F. Demarquaii* observes an uncertain or occasional periodicity.

Filaria Demarquaii has no sheath, neither has *filaria Ozzardi* (British Guiana). This is an additional point of resemblance between the two.

Filaria nocturna is exceedingly rare in this island, and elephantiasis very uncommon. This is another link in the chain of evidence proving the dependence of elephantiasis on the presence of *filaria nocturna* in a locality. I shall, however, reserve my remarks on this subject for a future occasion.

Nothing is yet known as to the pathological rôle played by *filaria Demarquaii*.

The points I wish to lay stress on at present are the prevalence of *filaria Demarquaii* in certain parts of St. Lucia, and the close similarity that exists between *filaria Demarquaii* and the sharp-tailed form of *filaria Ozzardi* (British Guiana); so exactly do they resemble each other in every particular that I incline to the conclusion that they are one and the same species.

NOTE.

¹ Dr. Manson has subsequently found the same, or a similar, blood worm in a native of New Guinea.

A NOTE ON DRACUNCULUS MEDINENSIS.

By MAJOR V. HARRINGTON, I.M.S.,
Uluwar, Rajputana, India.

IN, I think, 1896, I saw a very interesting note in the BRITISH MEDICAL JOURNAL relating to the metamorphosis and embryo life of the *dracunculus Medinensis*, but there was one point in the letter I cannot help thinking is open to such doubt as to be misleading as a statement of proved fact. This point referred to the wonderful instinct of the immature parasite, which, on being taken into the system through the alimentary canal, enabled it to find its way to the various situations in the connective tissue of the body in which it is usually found as a full-grown and mature parasite. This matter has, I know, been much discussed, and I see that the late Dr. T. S. Cobbold, in Quain's *Dictionary of Medicine*, inclined to a similar view, that is, that the parasite was introduced into

the body with the drinking water. At the same time my own experience, based on the study of a large number of individual cases, leads me to differ entirely from this opinion.

Some years ago I happened to be stationed in a part of the country where guinea-worm was prevalent, and in addition to other cases I took careful notes of some 200. These notes, I regret to say, have I fear been consumed, together with other papers, by those curses of India, the white ants, so I am unable now to give exact figures. Amongst these, in about 75 to 80 per cent., the parasite was found in the lower extremity and the greater number below the knee; the other 20 to 25 per cent. were in the following order of position—the back and waist and the upper extremity, and head, neck, and groin. With the exception of a few which had penetrated into the connective tissue between the larger muscles of the calf and thigh, none of them were deep-seated; in fact, portions of the majority of them could generally be detected lying beneath the skin by the finger. The percentage of cases in the lower extremity would have been larger had it not been for a couple of bhisties (water carriers), out of one of whom I removed no fewer than seventeen guinea-worms during one period of admission into hospital, all but three of them being on the back and loins along the line of contact of his mussuck (leather water-bag). One case of guinea-worm of the scalp and neck I traced to the fact of the man fetching water for his garden from a filthy pond and carrying it in a gurrâh (earthenware pot) on his head, from which some of the water splashed over on to his head and neck. The case in the groin was interesting; it occurred in a sepoy who some months previously had been with some officers out shooting. One of the birds fell into a dirty tank only used for cattle and buffaloes, and known to be full of embryo guinea-worms. He went in up to the waist, wetting his dhoti or loin cloth, which he neglected to take off and dry. The result was a guinea worm in the superficial upper part of the groin; the wet dhoti evidently retaining this parasite, and giving it the time and opportunity for making its entrance through the pores of the skin. Those persons in whom the *dracunculus* was found in the lower and upper extremities were chiefly villagers, who were in the habit of taking their cattle down to water to stagnant ponds, in which they waded and sometimes washed (?) The cases of the bhisties were most marked, the line of contact of the mussuck with the bare back being the chief part attacked, and the few in the legs must have been caused by the entrance of the parasite while the men were standing in the water filling their mussucks. One of the men, it was discovered, had been in the habit of getting water from a stagnant pool near for garden and cattle watering purpose, which water was not used for drinking.

Physiologically speaking, I would ask a careful consideration of the anatomical conditions of the abdominal cavity. However great the instinct of the parasite may be, the difficulties she would have to encounter in order to find her way to the lower part of the leg would, one would consider, be anatomically almost insurmountable. How would she pass the powerful barriers between the abdomen and the thigh? and again those at the knee? Further, should she elect the upper extremity, the passage upwards past the thorax would be fraught with many almost insuperable obstructions, and it would be strange indeed if some did not fail by the way; yet I have heard of no cases in which a guinea worm has elected either from choice or force of circumstances to remain and bring forth her viviparous progeny in the cavities of either the abdomen or the thorax. All cases seem to point to the connective tissue somewhere in the neighbourhood of the skin as her favourite place of abode, and comparatively few cases are recorded in which deeper structures are selected, and even then it is only in the connective tissue between muscles. The structure of the muscles is seldom affected, and when that does occur, it is usually the result of the inflammation and suppuration set up by the presence of the worm or broken portions of it.

As far as my experience goes I hold to the opinion of Dr. Carter and others that the sexual maturity of the *dracunculus* is attained previous to its entrance into the human body, and that the female penetrates the skin through its pores when she gets the opportunity and develops in the connective tissue beneath it, giving no sign of her presence until near the full time of her gestation. In fact I am inclined to go still