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Compliments of J. S. Buist, M. D.

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Cases of *Filaria medinensis*, Guinea
Worm, or *Dracunculus*.

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[PAPER G.]

Cases of Filaria medinensis, Guinea Worm, or Dracunculus. By
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The parasites presented for your consideration belong to the class of round worms, and are described by pathologists under the distinctive titles of Guinea Worm, or Dracunculus, inhabiting the connective tissue of man and some animals. One of these is sixteen, and the other eighteen inches long. They were extracted from the legs of healthy subjects, who had recently returned from the East Indies.

A brief history of these cases may not be out of place, as the existence of these parasites might be overlooked, the symptoms being confounded with those of other conditions, which they simulate in the early stages of their development, leading to false diagnosis, and, perhaps, injury to the patient. This is natural, as these parasites are not indigenous to our climate.

John F., a native of England, aged thirty-four years, was placed under my care, in April, 1872, with the following history: About six months previous to observation, he had shipped from a port in India to Liverpool. The voyage lasted about four months. In a few days he shipped for the port of Charleston, S. C. About two weeks before his arrival at Charleston, he experienced most excruciating intermitting pains in the left groin. The pains shifted alternately to the knee joint, and were occasionally accompanied by the appearance of a stiff cord on rising, beneath the skin, about the size of stout whip-cord. About four days after the attack, a small abscess commenced to develop itself at a point midway between the heel and the internal malleolus, which, upon bursting, discharged a thin, watery liquid, intermixed with a small amount of pus. The pain was intense. A sloughing, spreading ulceration, accompanied by a swelling of the limb, and an erysipeloid inflammation soon rendered him unable to bear the slightest pressure upon the affected member.

In this condition he reached the city, and at once sought medical aid. The first physician under whose care and observation he came, noticed, as he thought, a piece of tendon protruding from the wound, and, supposing that he had a case of phlegmonous erysipelas to deal with, removed the cord-like protrusion with a sharp pair of

scissors, and directed Iodine externally. Finding no relief, in a few days he was placed under my care, and the following noted :

A sloughing sore, about the size of a silver dollar, discharging a thin, turbid, and somewhat bloody fluid. Considerable tumefaction of the limb, extending to the knee joint, with much pain upon pressure. Constitutional disturbance slight. The principal pain in the leg seemed to follow a definite course, about twelve inches in length, extending from the ulcer upwards. No satisfactory diagnosis, with the points and facts above enumerated, was made. Warm applications to the leg seemed to give great relief and secure comfort. Two days after first observation, a small white point was noticed at the centre of the ulcer. It gradually protruded, until in a few hours about two inches of a white cord lay upon the surface of the ulcer. This was removed, and, upon careful examination, was found to be of a parasitic nature, and the diagnosis of *Dracunculus* was established. The case was carefully watched, and, upon a further protrusion, the distal end was attached to a lead pencil, and gentle traction produced by winding the animal upon it gradually. In a few days it was extracted. The worm referred to is the first of the two just exhibited. It is about sixteen inches in length. As soon as it was completely removed the patient began to recover rapidly, no further symptoms manifesting themselves.

The second case coming under my treatment, presented points of peculiar interest, inasmuch as the diagnosis was made before the appearance of the worm, and was observed in its whole course.

William P., a native of Denmark, a seaman in the British merchant service, aged twenty-eight years, was admitted in December, 1873, with pneumonia of the left lung, second stage: was treated, and made a rapid recovery. He complained of no unusual symptoms. General health good. Lungs restored to their natural condition. Like the patient in the first case described, he had but recently returned from India.

A few days before the time for him to return to his ship, very acute wandering pains commenced in the chest. They would continue for a few moments, cease, and then recur. Suddenly the pains left the thorax and became excruciating in the abdomen. Anodynes afforded no relief. The distress of the sufferer was extreme. The left thigh was next attacked, the pain being so severe as to prevent the use of the limb, and to confine the patient to bed. No evidence of the parasite could be observed externally. For a few days all the symptoms disappeared, only to be renewed with greater intensity in the leg. The diagnosis of *Dracunculus* existing was firmly established, the general history of the case being considered, and in a few days it was confirmed by the development of the characteristic pustule near the inner malleolus. The head of the worm soon making its appearance, it was extracted piece by piece, but these being very small were not preserved. The ulcer

soon healed, and the leg recovered. About one week after, there was a repetition of all the symptoms above described, the pain commencing in the chest, passing the abdominal region into the right thigh and leg, establishing the diagnosis of a second parasite. This one was, fortunately, extracted whole, by means of gentle traction. As seen, preserved, it is about eighteen inches in length, having very much the appearance of a piece of white whip cord. The head and tail of this specimen may be seen, and can be easily distinguished.

The parasites, the history of which is described in the above cases, though not indigenous to our climate, are sufficiently interesting to justify a condensed account of their origin, habitation, and natural history, inasmuch as we are liable at any time to meet with similar cases, imported, as they may be, through the open doors of commerce and emigration, with which our cities and country are now threatened.

These animals not being indigenous, we must look for our knowledge of their nature to those who have observed them closely, and studied their characteristics in the countries in which they originate

The Guinea worm is a tropical parasite. It is found in portions of Asia, in Abyssinia, Egypt, Guinea, and other parts of Africa. It is not found in America, unless imported from some of those countries, as in the cases just described. Both patients were seamen in the British merchant service, and had but recently returned from Calcutta, and, until the appearance of the worm, were entirely unconscious or even had a suspicion of its existence. In their examination they acknowledged to have at various times exposed themselves to the exciting causes, which are most likely to develop the worm, and even though rapidly transferred to a climate which is obnoxious to the development of them, yet these parasites pursued the same course as they would have done in their native climate. Except in cases where they are numerous in the body, they rarely cause death, but the amount of physical distress and mental anguish endured by the patient is beyond description. The number of worms observed in any one individual may vary. In the first case described there was but one; in the second two; and this is most usually the number, but it is not rare to meet with cases where five, six, eight, and ten worms are found. They generally appear simultaneously. The seat of the parasite is by no means uniform. The lower extremities are most frequently affected, or rather they tend to make their exit there. This was the fact in the two cases coming under my observation, but the worms have been known to make their exit from the eyes, nose, mouth, ears, cheeks, anus, thighs and back. Interesting accounts of their effects upon these localities are found in the works of Cobbold, Scott, Dubois, and Kennedy.

The migratory pains experienced before the extraction of the

worm are remarkable. There seems to be no doubt, that in the second of the cases reported here, the Guinea worm travelled from a point about the region of the thorax, traversed the abdominal walls, and, finally, after extending itself along the whole course of the thigh, made its exit near the internal malleolus. At times it could be felt like a solid cord beneath the surface of the skin, and would quickly disappear, only to reappear at another point, its movements always producing the greatest pain and distress. In the Indian Annals, (vol. vi., page 490, July, 1859,) Dr. Stewart relates a remarkable case, as illustrative of this feature in the worm. I quote: "Ten days after, he experienced an unpleasant sensation in the back of the left thigh. It shifted down until it reached the popliteal space. In a few days the sensation was experienced in the calf. Hitherto nothing was visible, but in a few days the convolutions of a Guinea worm could be felt at the outer angle of the ankle joint. A desire was expressed to cut down and extract, but the evening being dark it was postponed until morning, when it was found that the parasite had fled, and taken up a position in the deeper muscles of the foot. No trace of it could be found where it had been previously located. Abscesses formed, with severe inflammation of the foot; the worm was extracted piece by piece, and the patient was confined three months. It is rare that the animal travels from below upwards."

The Guinea worm varies in size. They have been found, on measurement, from six inches up to four feet in length, and about one-twelfth of an inch in diameter. An interesting account, showing an intimate acquaintance with the anatomy of the worm, can be found in a paper by H. C. Bastian, of the University College, in the transactions of the Linnæan Society. Dr. Aitken (Science and Practice of Medicine, vol. 1, pages 869-871,) gives a condensed account, also, from the same author. A remarkable fact, connected with the animal, is, that none but the female worm is ever found in the human body, and that nearly the whole extent of the parasite consists of the organs of generation, which are filled with innumerable young, so that the whole bulk of the parent worm—to which no parturient female of any animal can be compared for productivity—seems to be a uterus, containing a countless offspring.

When the parent animal has attained maturity, and presents its head for exit, as evidenced by the appearance of the small vesicle, these young ones seem to desire an exit to secure their future development, and are rapidly discharged if the uterine cyst is broken, adding much by their presence to the irritation set up in the parts. In the progress of the two cases under my care, this was illustrated in a marked degree, and for several days the discharge of the young *Filarix* was kept up. Seeking their natural element, which is water, they soon develop strength, and grow rapidly, and it is while in this state that they are most liable to attack the human being. The parasite flourishes most in impure streams filled with

vegetable débris, and can be introduced into the system either by the mouth or by contact with the external skin, where, imbedding itself, it remains until it reaches maturity. This period covers about six months, which corresponds to the time noticed in these two cases. Being a native of marshy places, sluggish mires, and stagnant tanks and reservoirs for water, and these last being used indiscriminately, both for washing and drinking purposes, by natives and foreigners, the worm at some time gets into the system, and is duly developed with the long train of distressing symptoms it was my fortune to observe. Both of my patients are aware of the fact of their having drank of the water, and, also, of having bathed in one of the sluggish streams of the East Indies, and could only, after reflection, trace the origin of their disease to the above named cause.

The parasite may be removed in a variety of ways. First. By cutting down upon it; or, second, when it has commenced to make its appearance, by gradually winding from day to day upon a smooth round stick, like a lead pencil, until it is entirely extracted. The animal sometimes comes forth spontaneously, but this is rare. Frequently the application of water to the parts produces the same result, and it is a common practice in India to submerge the affected limb in a running stream, and thus entice the worm from its unnatural bed. In my two cases extraction was the method adopted, with success. I found it necessary to support my patients with stimulants, and give anodynes in large quantities, to relieve pain.

I have thus endeavored to give a condensed account of these interesting parasites, as they have come under my observation. Being a rare disease, and one that we do not often meet with in this latitude, but, at the same time, most instructive, I have thought best to report it to the Association. Extended information may be found in the works of Aitken, Scott, Forbes, Lorimer, and Von Someran, to which I would respectfully refer, and to whom I am indebted for the main facts stated in this short article.



