On elephantiasis as it exists in Travancore / by Edward John Waring.

ON ELEPHANTIASIS, AS IT EXISTS IN TRAVANCORE.

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On succeeding, some months since, to the appointment of Physician to His Highness the Maha Rajah of Travancore, I found, not only that my own opportunities of studying disease in the Natives of India were greatly increased, but that, by the aid of the Medical Subordinates at the various out-stations, and the Vaccinators in the different districts, under my superintendence, I might be enabled to gain a very fair insight into the extent of the prevalent endemic diseases of the Travancore territory. As a means of testing the extent and value of the information which might be obtained from these sources, I made choice of Elephantiasis, one of the most familiar, as well as one of the most marked and striking forms of disease, respecting the diagnosis of which least difficulty was likely to arise, and which, on enquiry, I found to be strictly and extensively endemic in some portions of Travancore.

This disease presented, likewise, another advantage; namely, that its history on a large scale, as far at least as India is concerned, has never been investigated with the degree of accuracy which the importance of the subject demands, although some very valuable remarks on the pathology of the disease in Bengal from the pen of Professor Allan Webb of Calcutta, have recently been published in the Indian Annals of Medicine (Vol. 11, p. 619, seq.)

To ensure uniformity and conciseness, I prepared and printed a series of registers or tabular forms, in English and Malyallum, which were distributed to the Medical Subor-

dinates and Vaccinators at the out-stations, calling for information on the following points, with regard to persons who were subject to Elephantiasis*—1. Name—2. Age—3. Sex—4. Caste—5. Part or parts affected—6. Age at commencement—7. Length of time the disease had existed—8. If any and what relations were affected—9. If conjoined with any form of Leprosy—10. The assigned causes in individual cases—11. The usual diet of the patients—12. The position of the Village—13. The character of the water, &c. The total number of cases obtained through these channels, amounted to 542.

Dr. Pringle, the late Civil Surgeon at Cochin, also at my request, instituted a similar set of enquiries for me on the subject at Cochin where the disease, as is well known, is so prevalent as to be denominated in many works "Cochin Leg." The number of cases supplied by him amounted to 130.

At the same time I commenced actively to investigate the disease myself and I added to my own enquiries, some points which were omitted in the register sent to the out-stations, especially the connection between the disease and paroxysmal fever, the decline or otherwise of sexual appetite and power, the size of the limbs, &c. The number of cases I examined personally, amounts to 273, making with those supplied by Dr. Pringle, and from the out-stations, a total of 945 cases.

Many imperfections and short-comings, especially in regard to morbid anatomy, will be found to exist in the following observations; but, such as they are, I venture to lay them before my professional brethren in India, trusting that some of the results may not prove uninteresting or uninstructive; and believing that every accession of knowledge on the cause, history, and treatment of this obscure malady will be acceptable to many.

Before proceeding further, it will be advisable clearly to understand the form of disease which constitutes the subject of this paper. Elephantiasis being a term under which two,

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* To each Subordinate and Vaccinator a letter was also sent, desiring that no cases should be inserted unless actually seen and examined—and, from subsequent personal enquiries, I have reason to believe that every confidence may be placed upon the returns furnished.

if not three distinct diseases have been included, even by well informed writers of the present day. The disease then which I now propose to investigate is the *Elephantiasis Arabum* of various authors. *Elephantiasis Indica* and *Phlegmasia Malabarica* of Sauvages. *Buenemia Tropica* of Good. *Elephantiasis Tuberosa* of Alibert. *Sarcocele d'Egypt* of Larrey. *Hernia Carnosa* of Prosper Alpinus and *Glandular disease of Barbadoes* of Hillary and Hendy. Its names in German are *Oclshenkel* and *Drusenkrankheit*, in French *Lepre tuberculeuse Eléphantine* and in English *Elephant Leg* and *Yam Leg* (on account of its form) and *Cochin Leg*, *Galle Leg*, *Barbadoes Leg*, &c., (from the places in which it is endemic.) It is also called simply *Elephantiasis*.

The names by which it is most commonly known in the East are:—

Sanscrit श्लीपदं Sleepāthum पादवल्मीकं Pauthavulmeekum.

Arabic داالفيل Da-ool-feel.

Persian فيلپاي Fil-pāī.

Hindostanee فيلپاي Fil-pāi کا پاون هاتي Hathi-ka-pahun.

Tamul	Perun-kaal	Anay-kaal.
Malyalym	Munthu-kaal	Peru-kaal.
Teloogoo	Motha-kaaloo	Yanuga-kaaloo.
Burmese	Khyā-gyee-na.	

The *Elephantiasis Græcorum* is a totally distinct affection, being synonymous with Tubercular Leprosy.

After this long preamble, which was rendered necessary fully to explain the circumstances under which the enquiry has been conducted, we will now proceed to analyze the collected facts.

Influence of Sex.—The sexes of the patients are detailed in every case, and we find the numbers to stand as follows:—

Males, ...	716	=	75·76 per Cent.
Females, ...	229	=	24·34 „
	945		100·00

These figures tend to establish the greater liability to Elephantiasis amongst men than amongst women, in the pro-

portion of $3\frac{1}{2}$ of the former to 1 of the latter. The proportions in the three returns on which these figures are based, present considerable variation. In the Cochin list, the proportion is 5 males to 1 female; in the out-station list, 4 to 1, and in my own list, it is only 2 to 1. The greater proportion, in my own cases, probably arose from the fact that my observations were chiefly made among the Syrian and other Christians who had none of the prejudices of caste to prevent their bringing their females before me*.

The present ages of the patients may be thus classed:—

From	5 to 10 years,	2	=	0·21	per Cent.
,,	11 ,, 15 ,,	12	=	1·27	,,
,,	16 ,, 20 ,,	54	=	5·71	,,
,,	21 ,, 25 ,,	71	=	7·61	,,
,,	26 ,, 30 ,,	117	=	12·38	,,
,,	31 ,, 35 ,,	98	=	10·37	,,
,,	36 ,, 40 ,,	156	=	16·49	,,
,,	41 ,, 45 ,,	110	=	11·55	,,
,,	46 ,, 50 ,,	112	=	11·76	,,
,,	51 ,, 55 ,,	70	=	7·35	,,
,,	56 ,, 60 ,,	66	=	6·98	,,
,,	61 ,, 65 ,,	22	=	2·32	,,
,,	66 ,, 70 ,,	10	=	1·05	,,
Over	70 years,	10	=	1·05	,,
Doubtful or not stated,		35	=	3·67	,,
		945		100·0	

The three returns presented a remarkable uniformity with regard to the ages of the patients; by far the larger proportion existing between the 26th and the 50th year of age. Of the cases which fell under my own notice, the greatest ages were 79 and 80 respectively, and though doubt may be expressed as to the correctness of the ages given, the appearance of the individuals fully bore out their statement. The youngest patient I met with personally, was 15 years, and this only in two instances, I was told of children of 10 years old who were affected, but I never saw them. The Cochin List

* In the Table of Shertullay cases in the Appendix (b,) it will be seen that of 2,133 cases of Elephantiasis existing in that district, 1,512 or 70·89 are males, and 621 or 29·11 per cent. females, a proportion approximating closely to that presented in the above return.

Reprint from No. IX of the Indian Annals
of Medicine, Calcutta—1858.

contains several of 13 and 14 years of age. It is very rare indeed to meet with cases under 15 years old.

The length of time the disease had existed was given by the patients in 945 cases; they may be classified as follows:—

Under 1 year, ...	44 =	4·66	per Cent.
Between 1 and 5 years, ...	197 =	20·85	„
„ 6 „ 10 „	196 =	20·74	„
„ 11 „ 15 „	136 =	14·39	„
„ 16 „ 20 „	126 =	13·33	„
„ 21 „ 25 „	79 =	8·36	„
„ 26 „ 30 „	71 =	7·52	„
„ 31 „ 35 „	30 =	3·17	„
„ 36 „ 40 „	23 =	2·43	„
„ 41 „ 45 „	11 =	1·16	„
„ 46 „ 50 „	2 =	0·20	„
„ 51 „ 55 „	2 =	0·20	„
Doubtful or not stated, ...	28 =	2·96	„
	945	100·00	

This Table is chiefly instructive (if taken in conjunction with the Table of Ages,) as tending to prove that Elephantiasis has little, if any influence in shortening the duration of life, and that it may exist for a very lengthened period, without proving fatal.

It by no means follows as a sequence that, because the disease has existed for a great length of time, the size of the extremity or part affected, should be proportionably large. It will be shewn hereafter, that no increase in the size of the affected part takes place in the absence of febrile paroxysms; and, as, in some individuals, the fever does not recur oftener than once in a twelve month, the increase of size in them is comparatively small.

Of course some doubt naturally attaches itself to the statements of those who speak of the disease as existing 30, 20, or even 10 years, but they may be taken at any rate to imply that it has existed for a very long period; indeed, there appears to be no doubt that it may, and often does, commence at an early age, and continue with more or less increase to extreme old age, and that too, without materially affecting the health of the patient, or shortening the duration of life.

The size of the enlarged lower extremity was noted under

my own superintendence in 340 instances. They ranged as follows:—

8	Inches in circumference, ...	2	
9	„ ..... „	28	
10	„ ..... „	68	
11	„ ..... „	103	
12	„ ..... „	61	
13	„ ..... „	40	
14	„ ..... „	15	Average of 340 cases $11\frac{7}{12}$ inches nearly.
15	„ ..... „	9	
16	„ ..... „	5	
17	„ ..... „	1	
18	„ ..... „	5	
19	„ ..... „	1	
21	„ ..... „	1	
24	„ ..... „	1	
		340	

These measurements were uniformly taken round the ankle. It is necessary distinctly to understand this, or we might be led to form, from the above statement, a very erroneous estimate as to the size generally met with. The ankle was by no means the site at which the greatest enlargement was observed; thus, in the man (No. 59,) whose ankle was 24 inches in circumference, it was found on measurement to be 27 inches round the calf of the leg. In another case, (No. 68,) in which both lower extremities were affected, the measurement at the ankle of the right side was only 12 inches, and the left 13 inches, but the feet were of an enormous size, the toes entirely hidden, and the whole of both feet converted into huge shapeless masses. Generally speaking, the enlargement was confined to the space below the knee, but exceptions to this were sometimes observed; thus, in one case (No. 157,) the leg was large from the hip downwards.

Round the middle of the thigh, it was 18 inches.
„ Calf of the leg, ... 20 inches.
„ Ankle, ... 18 inches.

As observed in the preceding section, no connection whatever exists between the size of the limb and the length of time the disease may have existed, the size appears to be dependent solely on the violence and frequency of the return of paroxysms of fever. A man who has a violent febrile paroxysm once or twice a month, would *cæteris paribus*, have a larger leg in five years, than another person who has only

a mild attack once annually, would have after a period of fifty years. So uniform was this connection between fever and the enlargement, that latterly, after examining some two hundred cases, I could almost foretel, from the size of the limb, how often the fever recurred. Of course there were exceptions, but as a general rule, it was not a little remarkable.

The age at which the disease first appeared, is a point of considerable interest; the result of enquiry on this subject is as follows:—

"Since Childhood,"	16 =	1·69	per Cent.
Five years and under,.....	7 =	0·74	„
Between 6 and 10 years, ...	33 =	3·49	„
„ 11 „ 15 „	111 =	11·74	„
„ 16 „ 20 „	222 =	23·58	„
„ 21 „ 25 „	154 =	16·29	„
„ 26 „ 30 „	149 =	15·76	„
„ 31 „ 35 „	65 =	6·87	„
„ 36 „ 40 „	74 =	7·83	„
„ 41 „ 45 „	36 =	3 80	„
„ 46 „ 50 „	25 =	2·64	„
„ 51 „ 55 „	9 =	0·95	„
„ 56 „ 60 „	8 =	0 84	„
„ 61 „ 65 „	5 =	0·53	„
Above 70 years, ...	2 =	0·20	„
Not stated or doubtful,.....	29 =	3·07	„
	945	100	

The remarks made when commenting on the Table, shewing the length of time the disease had existed, apply in a great measure to the present one. The memory, especially that of the Natives of India, with regard to the lapse of years, is apt to be at fault, and it necessarily follows that, if a doubt rests (as in part it undoubtedly does) on the statement of the patients, as to the length of time the disease existed, a similar doubt must rest on their statements as to the age at which it made its first appearance.

Although this doubt may be entertained regarding the exact ages, the figures in the above table justify us in regarding the period of adult life (say from 15 to 40 years) as that at which the disease most commonly makes its first appearance. No age however, appears to be exempt. With regard to its invasion in old age, the evidence is more satisfactory; thus a very aged looking man (No. 55,) who asserted his age to be 79, stated positively that the disease commenced only five years previously, and of such a brief period of course he could

speak with confidence. Mr. Anderson, the Apothecary at Alleppee, (No. 49 in Alleppee list) cites the case of an old Mussulmanee woman aged 80, in whom the disease had existed only two years, making her age at its invasion 78 years. Where the disease was of recent origin, of course the patients could speak more confidently as to the age at which it commenced.

The part or parts affected with Elephantiasis was a point to which particular attention was directed, and here we have the advantage of not being obliged to trust to the statements of the patients, but had only to abide by the evidence of our own senses.*

Right lower extremity.	291	*Right lower extremity* either alone or with other parts 307 or 32·49 per Cent.
„ „ and right hand, ...	10	
„ „ left hand, ...	4	
„ „ both hands, ...	2	
Left lower extremity, ...	272	*Left lower extremity* either alone or with other parts 287 or 30·37 per Cent.
„ „ and right hand, ...	5	
„ „ left hand, ...	9	
„ „ Scrotum, ...	1	
Both lower extremities,...	296	*Both lower extremities* either alone or with other parts 344 or 36·40 per Cent.
„ „ and both hands, ...	15	
„ „ left hand, ...	15	
„ „ right hand, ...	16	
„ „ left mamma,.....	1	
„ „ left hand, left		
Mamma and two fingers of right hand,	1	
Scrotum, ...	3	Other parts 7 or 0·74 per Cent.
Right hand alone, ...	1	
Left hand alone,....	2	
Lobe of ear, ...	1	
	945	

This Table contains much interesting and suggestive matter for consideration. The most striking feature is the great frequency of the disease in the lower extremities, in comparison with the upper. If we take the cases in which the lower and the upper extremities were affected, setting aside those in which the disease likewise existed in other parts, we find to 859 of the former, only 3 of the latter. The rarity of the upper extremity becoming the seat of the disease, without its previous existence in some other part of the body, may be judged of, by this statement.

* The reader will see, by comparing these figures with those in the Shaertullay List in the Appendix (b) that the proportions in both tables closely approximate to each other.

In all the cases in which the upper and lower extremities were conjointly affected, I found, on enquiry, that the disease had invariably commenced in the latter site, the leg and foot being always the seat of its first appearance.

Little difference appears to exist with regard to the side affected, both the right and left lower extremities being attacked in about equal proportions. A slight excess appears in favour of the right side, in the proportion of 32 to 30 (per cent).

In those cases in which both lower extremities were affected, I was unable to discover that there existed any general rule as to which side first evinced the disease.

One other point merits consideration, namely, the extreme comparative rarity of Elephantiasis of the scrotum. What gives interest to this point is the fact that, on the Eastern Coast of the Indian Peninsula, and also in Bengal, Elephantiasis of this part is of comparatively frequent occurrence; and it is difficult to afford any satisfactory explanation why it should be so rare in these localities, Shertullay, Alleppee, &c., where Elephantiasis of the leg is so very prevalent.

The above figures have reference, of course, to the sites of the disease as they presented themselves at the time of being registered; but it is a remarkable fact, connected with the disease, that, occasionally, it disappears from one site only to re-appear in another. I have at present, a man under treatment, who, for some years, had enlargement of the right leg. Five days before applying for relief, he experienced a sharp attack of fever, and it terminated in the whole of the swelling disappearing in the right leg and re-appearing in the left. From its present appearance, it would not be known that the right leg had been affected. Some cases in which a similar change of site had occurred, are noticed in Professor Webb's paper before referred to.

The co-existence of Leprosy and Elephantiasis.—Nothing perhaps has tended more to retard our attaining a correct knowledge of the nature and treatment of the disease now under consideration, than the unfortunate confusion which has so long existed between Elephantiasis Græcorum and Elephantiasis Arabum, the former being that fearful constitutional malady, tubercular leprosy, the latter being the comparatively mild and local affection, Elephantia, Elephantiasis or Cochin Leg.

Many well informed and experienced medical men, even in India, still regard them as allied diseases, but from such an

opinion I must, with diffidence, be allowed to express my dissent: they present no features in common; in their origin, progress, and termination they differ essentially. The distinction between them is well insisted upon by Dr. Copland, in his admirable Dictionary of Practical Medicine, (vol. ii., p. 701 et seq.) he speaks of the distinction between them being "very wide," and adds that "it (Elephantiasis Arabum) is not a tubercular malady" which true leprosy undoubtedly is.

In 919 cases in which the conjunction or otherwise of these diseases is noticed, we find

No symptoms of leprosy present, ...	867	or 94·35
Leprosy co-existent, ...	52	or 5·65
	919	100·00

As a doubt might be entertained as to the accuracy of the returns from the out-stations I may add that, in the 273 cases examined by myself, 255 or 93·40 per cent. were undoubtedly free from any symptom of leprosy, 12 or 4·39 per cent. were thus affected; and 6 or 2·18 per cent. presented ulcerations which some might have regarded as leprous, but which appeared to me to be decidedly syphilitic; these therefore I entered as doubtful.

In the out-station list of 542 cases, 491, or 90·59, were free from leprosy, 33 or 6·09 were affected, and 18, or 3·50, are entered as doubtful. In Dr. Pringle's Cochin list of 130 cases, 121 or 93·07 per cent. were free, 7 or 5·39 were affected, and 2 or 1·53 were doubtful. The uniformity exhibited by these three series of observations, conducted entirely independently of each other, is not a little remarkable.

The Occupations of those afflicted with Elephantiasis may be thus classed:—

Coolies or Labourers, ...	318
Ryots, Farmers, Agricultural Labourers, ...	158
Merchants, ...	68
Domestic Servants, ...	55
Oilmongers, ...	33
Cocoanut climbers, Toddy sellers, ...	33
Carpenters, ...	21
Weavers, ...	16
Writers, ...	15
Barbers, ...	15
Fishermen, ...	11
Singers, Musicians, Jugglers, Actors, ...	7
Boatmen, ...	8

Goldsmiths and Jewellers,	5
Bricklayers,	7
Peons and Sepoys,	6
Dhobies, (Washermen,)	7
Cooks,	3
Painters,	3
Baker, Cow-keeper, Dyer, School-boy, Hunter, Sawyer, Pot-maker, Astrologer, Rope-maker, Grass-cutter, Sweeper, Rice-beater, Basket-maker, Post Office runner, Chunam-worker, Ironmonger, Gentlemen, one each,	17
	800
Doubtful or not stated,	145
	945

From this Table it appears that persons of a great variety of occupation and business are liable to Elephantiasis. Wealth and comfortable circumstances afford no barrier to its invasion; as, amongst the merchants and farmers, were wealthy and substantial persons. At the same time, it must be owned that by far the greater proportion of those attacked were in poor circumstances, and destitute of many of the necessaries, small as they are, of Hindoo life. It will be seen that of the 800 ascertained occupations, 11 only were fishermen, and as this class of persons are almost entirely Icthyophagous, it goes far to disprove the alleged connection between a fish diet and this disease. This point will be alluded to subsequently.

The castes of the patients were recorded in each case, and may be classed as follows: premising that, under the heading of "Other Hindoo Castes," are included those numerous castes as carpenter, dhobie, &c., which fill up the social Hindoo scale, from the Illoover to the Soodra or Nair, and all of whom partake more or less of animal food. Under the term "Christian" are included Syrian Christians, Roman Catholics, and Protestants, who all unite in one point, namely, in eating and drinking any thing which may come in their way. The Jews and Mussulmen are animal feeders, except in the article of pork, and though the latter are prohibited by the Koran from partaking of spirituous liquors, it may admit of a doubt, if all strictly attend to the prohibition. The Nairs or Soodras take animal food very sparingly, as a general rule. The Brahmins, of course, are almost entirely vegetable feeders, with the exception of ghee and milk, which they take abundantly:—

Brahmins,	10
Soodras or Nairs,	258
Other Hindoo castes,	144
Illoovers, Shanars, Tiers, and other low castes,	292
Christians,	187
Mussulmen,	51
Jews,	3
	945

Little practical information is to be drawn from this table, except that vegetable diet alone, (as in the case of the Brahmins,) affords no protection against the disease.

I have neither seen nor heard of an European in Travancore being affected. Three persons of Dutch descent, whose ancestors had been residing in India above a century, came under my notice, and also one Portuguese; but each of these patients bore evidence of being of mixed parentage. They were all persons in comfortable circumstances.

Animals and birds are said to be occasionally attacked in Barbadoes, and other places where Elephantiasis is very prevalent. Particular enquiries were made on this point at Shertullay and the neighbourhood, and I could hear of no cases in animals; but at Alleppee a hen was brought to me, in which one leg was very much enlarged; whether it was really Elephantiasis appeared doubtful; it certainly bore a strong resemblance to it.

Causes.—It must be admitted that patients, especially those of the ignorant and uneducated classes, entertain very erroneous and absurd ideas as to the origin of any disease under which they may be labouring; and it would be highly injudicious to place much reliance on their statements in this respect, yet a table, such as the subjoined, especially with reference to an obscure disease, cannot be altogether devoid of interest. Varied as the assigned causes are, they may be thus classed:—

Fever,	458
Bathing in bad or tank water,	17
Use of bad water,	8
Bathing in bad oil,	22
Want of oil for bathing,	14
Falls, blows, contusions, sprains,	50
Ulcers, Abscesses, "Sores,"	7
Bubo,	3
Bite of dog (4), of snake (4),	8
„ of poisonous fish,	1

Rheumatism (7), Paralysis (5),	12
Residence at Cochin,	3
Hereditary transmission,	3
Hard work,	4
Want of proper food,	2
Bad confinements,	3
Exposure to bad weather,	5
Headache (2), skin disease (1),	3
" Swelling of the limb,"	29
" Came of itself", " no assigned cause,"	281
	933

A few of these assigned causes require separate consideration.

Fever.—When I commenced the present investigation, I was not fully aware of the importance of ascertaining minutely the connection which exists between Elephantiasis and Fever. I was aware of the generally acknowledged fact, that fever was often concomitant with the appearance of the malady; but it was not until I had made considerable progress in my enquiries, that I became aware of the intimate connection which exists between them, and of the vast importance of tracing this connection with accuracy. Fortunately, it was not altogether too late, and, in every subsequent case which came under my notice, 226 in number, I was particular in my enquiries on this point. The results are shown in the subjoined tabular statement.

Of the 226 cases examined.

Fever had existed in	224	or in	99·11 per Cent.
„ „ not existed in	2	or in	0·89 „
	226		100·00

Of the two cases in which Fever was stated not to have co-existed with the Elephantiasis, one (No. 85) was a Brahmin ætat. 34, whose leg was very slightly enlarged, and in whom the symptom had only existed for one month. The other was a Syrian Christian female (No. 35,) ætat. 30, who had had enlargement of the right leg for twelve years; the circumference at the ankle, 12 inches. She stated that she never had any accompanying fever; simply pain, and swelling of the part periodically.

These are the only two exceptions I had met with in 226 cases, the remaining 224 had periodical returns of fever in the following proportions:—

Febrile paroxysm,		once monthly,	38
,,	,,	twice monthly,	36
,,	,,	three times monthly,	17
,,	,,	four times monthly,	6
,,	,,	five times monthly,	5
,,	,,	once in two months,	10
,,	,,	once in three months,	24
,,	,,	once in four months,	10
,,	,,	once in five months,	3
,,	,,	once in six months,	9
,,	,,	once in seven months,	2
,,	,,	once in twelve months,	8
,,	,,	once in twenty-four months,	1
Irregular,			43
Only had one attack,			4
No fever for one year,			2
,,	for two years,		2
,,	for three years,		1
,,	for fifteen years (checked by opium,)		2
,,	for ten years (stopped spontaneously,)		1
			224

The above Table is highly valuable, as illustrating the intimate connection which exists between Fever and Elephantiasis. The question which naturally presents itself, on perusing it, is, in what light are we to regard this fever? which is cause, and which is effect? Are we simply to look upon the Fever as one of the attendant symptoms of Elephantiasis, and merely as symptomatic of inflammation of the Lymphatic vessels and glands; or, are we justified in regarding the inflammation of the Lymphatics, the local pain and erysipelatous swelling, and the subsequent deposition of albuminous matter constituting the disease known as Elephantiasis, as a sequence or result of fever.

The former opinion has been upheld by Hendy and most other writers, the latter by Dr. Hillary and Dr. Musgrave, and though it stands opposed to the opinion at present generally entertained by the profession, yet, after giving the subject the most earnest consideration, the conviction on my mind undoubtedly is, that fever is the primary disease, and that the albuminous deposit and enlargement constituting Elephantiasis, are a secondary affection.

The regular periodicity of the attacks tends to establish a belief in the febrile origin of the disease. However diversified may be the interval between the attacks, varying from a paroxysm every sixth day or five times monthly, to one in a twelve month, or every two years, yet, in the majority of instances, the febrile paroxysm is stated to recur in the same

individual with great regularity. In the preceding Table it will be seen that, out of 224 cases, the fever is said to have been irregular in only 43; in the remainder it occurred with great regularity, at stated periods. Whenever a disease, especially one of a febrile nature, exhibits a distinct periodicity, most Medical men incline to the belief that it is of malarious origin. Periodicity is one of the most distinctive symptoms or signs of the operation of a malarious poison on the system. Now we have no knowledge of any disease analogous to malarious or periodic affection of the Lymphatics, attended by fever and the subsequent deposition of lymph; under these circumstances it seems more rational to regard the fever, which precedes any local Lymphatic disturbance, as the *fons et origo mali*, and to look upon the deposition of albuminous matter in the extremities as one of the sequences of the febrile action, and of the secondary inflammation of the Lymphatics.

The succession of symptoms would also tend to establish the same belief in the origin of Elephantiasis. As a general rule, the febrile paroxysm precedes the local symptoms. This has been particularly noticed at the invasion of the disease. In subsequent attacks, the enlargement of the Lymphatic glands in the groin or axilla, may be observed concomitant with the cold stage of the fever; but this is of comparatively rare occurrence, the fever in most cases preceding the local disturbance.

The statements of the patients themselves tend to establish a belief in the febrile origin of the disease. If the reader will turn to the table of assigned causes, he will see that of 652 persons who ascribed the invasion of the disease to some specific cause, no less than 458, or 70 per Cent., attributed it to fever; and what more natural than that they should do so, seeing that a febrile attack had been the immediate precursor of the enlargement of the limb? With the two exceptions previously mentioned, every patient afflicted with Elephantiasis, who has detailed his case to me, agreed in one point, "*no fever, no enlargement.*" In the interval between the febrile paroxysms, no enlargement of the limbs takes place; and if, from any cause, such as removal to an uninfected site, &c., the fever become checked, so likewise proportionally is the enlargement of the affected part also checked.

My note-book supplies me with many illustrations of the last observation.

Eetedah, Syrian Christian, male, ætat. 42, merchant, both legs affected; disease commenced at the age of 26, no relations

affected. He used formerly to have fever with rigors once a month. For a whole year he has now had no fever, and during this period there has not only been no increase, but rather a decrease in the size of the legs. (No. 20 in Sharetullay List.)

Popanjan, Congany, male, ætat. 61, Merchant, left leg affected; disease commenced at the age of 39, only son affected. Had fever regularly for 19 years when it ceased, and from that time, a period of three years, there has been neither fever nor any increase in the size of the leg, which remains *in statu quo*—says it stopped spontaneously; took no remedies to check the fever. (No. 156.)

Mythen, Mussulman, ætat. 24, Merchant, right leg affected; enlargement commenced at the age of 18, brother affected; used formerly to have fever twice or three times a month. He took a large quantity of black pepper to check the fever, and now, for two years, he has had no return of fever, nor has there been any increase in the size of the leg; it remains *in statu quo*. (No. 180.)

Jyepen, Illoover, male, ætat. 20, Coolie, right leg affected; swelling commenced one year since, had a severe attack of fever once only, when the enlargement first appeared. No fever since, nor has there been any increase in the size of the limb. (No. 22.)

Chaco, Syrian Christian, male, ætat. 48, right leg affected; swelling commenced at the age of 30, mother and brother affected; for the first three years he used to get fever three times a month, but, for the last fifteen years, he has taken opium, and during the whole of this period he has had no fever, only slight shivering and perspiration, and there has been no increase whatever in the size of the leg. (No. 213.)

These cases have an important practical bearing, not only as illustrating the intimate connection between Elephantiasis and Fever, but, as shewing that, in order to check and control the former, we must first adopt measures to subdue and eradicate the latter.

The fever which attends the first appearance, and every subsequent attack of the disease, is characterized by a cold, hot, and sweating stage, constituting together a true paroxysmal fever. It differs comparatively little from ordinary intermittent fever, excepting that, generally speaking, the paroxysms are more prolonged and severe in their character, mostly extending over a period of three days, and even sometimes longer. Most cases are attended by head-ache.

described by some simply as a sensation of weight or dullness; by others, as a piercing and shooting pain; but by far the greater proportion described it as a most painful and distressing feeling of distention of the brain, as if it were swollen, and if as at the same time the skull was too small to retain its contents. This head-ache appears to be a uniform and very marked symptom, and lasts throughout the cold and hot stages, delirium is occasionally present. There is also generally much gastric irritability, with nausea and vomiting, and sometimes distressing flatulence.

The distinguishing characteristic of the fever, however, is the erysipelatous enlargement of one or more of the extremities, from which a red line of inflammation may be traced along the line of the lymphatic vessels, extending to an enlarged and painful gland in the inguinal or axillary region, according as the upper or lower extremity is affected: great pain is experienced in these glands, especially on pressure, and there is much uneasiness in all the neighbouring parts. Though so enlarged and painful, they rarely take on a suppurative action; but their tumified condition may remain for several days after the fever has subsided. The enlargement of the extremity attains its maximum towards the termination of the febrile paroxysm, and after this has passed off some days, the extremity decreases considerably in size, though it remains larger than it was before the febrile attack occurred. The resulting swelling or enlargement is, in mild, cases uniform, not pitting on pressure, and of rather lower temperature than the upper part of the limb. In some cases a little bulla appears near the ankle and, after each attack, a large amount of serum exudes; in such instances the enlargement is generally inconsiderable. Several such cases were mentioned to me, but only two have fallen under my own observation.

Of the three stages, the cold is the most marked and severe, and is very rarely absent; it lasts one, or even in some cases, two whole days, and all patients speak of it as the most painful and dreaded part of the disease. The hot stage appears also, in most cases, to be very severe; the third or sweating stage is the one which is least uniformly present, and very mild in proportion to the severity of the two preceding stages. Some individuals describe it as altogether absent; and, at one time, I was inclined to believe that some connection might be found to exist between the absence or mildness of this stage and the albuminous deposit in the extre-

mities: but this idea was dispelled on finding that in other cases, subsequently examined, though the enlargement was very great, the sweating stage was by no means mild, the perspiration being described as literally streaming down from all parts of the body. As a general rule, however, the sweating stage is mild in comparison with the other two preceding stages.

In the intervals between the paroxysms of fever, the health appears to be in no way impaired, nor is any inconvenience experienced in conducting the ordinary duties of life, except in the very advanced stages, when the leg becomes of a great size, and interferes mechanically with progression; but such cases are comparatively rare. We have elsewhere adduced figures which tend to shew that it does not shorten the duration of life. In some, among the more respectable portion of the community especially, it appears to prove injurious to the health indirectly, by the mental depression which necessarily accompanies the knowledge, that what is regarded as an incurable disease, has attacked the system, a malady which will, in all probability, follow the sufferer through life, and to which some degree of disgrace is attached by the more ignorant portion of the community.

Whether, when the disease attacks the scrotum, and this becomes enlarged to a great extent, involving all the neighbouring parts, the generative powers become destroyed or diminished, or whether sexual desire becomes increased, are questions, I am unable to answer, having no cases to guide me. I have however questioned on this point many men whose legs have attained a great size, and a considerable number have told me that the desire for women has greatly decreased since the disease commenced; a few spoke of themselves as impotent, whilst a large number stated that the procreative power was not destroyed or impaired, and this was evidenced by the number of young children which had been born to them subsequent to the appearance of the enlargement. One example will suffice: Jyepen, Illoover, male, ætat. 40, Cooly, left leg and foot affected, foot particularly enlarged —a shapeless, undefined mass, existed for 22 years—has observed no change in his procreative powers, or sensations, has three young children, and his wife at present pregnant.

How far the child-bearing power of a woman with Elephantiasis is affected, is a point well deserving the attention of future investigators. At Shertullay, so often mentioned,

where the disease is of such extreme frequency, the number of married women who stated either that they were barren, or that their children had been still-born, or had died immediately after birth, was very remarkable. Of 48 women questioned on this point, 5 were barren, and 10 had had one or more still-born children. One woman, Carlee, an Illovah, ætat. 20, with both hands and both legs affected, had had three children, all still-born. (No. 185). Another woman Coorandai, Illovah, ætat. 35, both legs affected since childhood, had had four children, all still-born. (No. 207).

The powerful shock to the system from repeated attacks of severe fever, might doubtless, *per se*, exercise an injurious influence on the *fœtus in utero*, independent of the presence of the Elephantiasis.

2. *Hereditary transmission.*—Some writers have regarded the disease as hereditary. (See Copland's Dict., vol. i, p. 750); and, as this is a point of much interest, it is worthy of being considered at some length.

In a locality where a disease is endemic, it is often not only extremely difficult to decide how far hereditary predisposition may be regarded as a cause, but the question may be fairly entertained whether we are justified in ascribing to it any influence whatever.

Before deciding that any disease is hereditary, we should satisfy our minds that the disease in question is not one which ordinarily arises from the operation of miasma or malarious poison. It would be manifestly illogical to conclude that, because three or four succeeding generations, residing in a low damp malarious swamp, fell victims to intermittent fever, it was therefore hereditary. There are certain diseases, as phthisis, scrofula, gout, insanity, &c., which, in the true sense of the word, may be regarded as hereditary, because we are enabled, in a large number of instances, to trace the disease through many successive generations, however widely the circumstances may differ under which the individuals themselves may have been placed.

On entertaining the question, therefore, whether Elephantiasis is hereditary, the first question which presents itself is, does it in any degree arise from the operation of malarious poison? From the facts which will be adduced in considering the connection between Elephantiasis and Fever, it will be seen that the conviction on my mind, after giving the subject my best consideration, is that Elephantiasis is decidedly a disease having its origin in a Malarious Fever,

and that, consequently, we should be very cautious in admitting, if indeed we are not justified in altogether rejecting, the opinion in favour of its hereditary transmission. If an authentic case were adduced in which an individual affected with Elephantiasis removed to some inland locality where the disease was never known to have existed, and many such localities are to be found in Southern India, and were there to beget children who became affected with the same disease, the question of its hereditary transmission might be fairly entertained; but no such fact, as far as I am aware, is on record.

In the cases now under consideration, in reply to the question whether any and what relations are affected with Elephantiasis, the answers in 930 cases may be stated as follows:—

Relatives affected, ...	376 or 40·49	per Cent.
No relatives affected,.....	554 or 59·51	,,

With regard to the 376 cases in which relations were stated to be affected, 138 had one parent alone affected, 22 had both parents, 27 had one grand-parent, 38 had one or more brothers and sisters, 42 had uncles or aunts, and 8 had sons or daughters, affected in some degree with the same disease.

It would occupy too much space, without any commensurate advantage, to enter into a detail of the exact relationship of the other parties affected; but it may not be without interest, as shewing its extraordinary prevalence in some families residing in a district where the disease is endemic, to adduce a few cases by way of illustration. Narrainen, (No. 192,) residing in Shertullay district, had his grand-father, grand-mother, step-mother and six half brothers, besides himself, all affected with Elephantiasis. Shungra Pillay, (No. 6,) residing in the same district, himself with both legs and both hands of very large size, has *ten* members of his family similarly affected; namely, six maternal aunts, two uncles, and two brothers. Mathoo, (No. 130,) a Syrian Christian of Shertullay, ætat. 66, with both legs and left hand enlarged, has his father and his son labouring under the same malady, thus presenting three successive generations affected with the disease. These three cases came under my own observation; the dresser at Quilon, reports a case there, in which a patient with the disease had his father, mother, two sisters, and two brothers, all similarly affected!

It may seem at first sight that the facts now adduced, would tend to establish the opinion that hereditary transmission is a powerful predisposing cause; but, viewing the disease as a sequence of fever, I can no more regard this opinion as correct than I could, that enlargement of the spleen is hereditary, because ten members of one family, or even three successive generations presented enlargement of that viscus, in a district where intermittent fever is endemic.

We, however, possess some negative facts strongly opposed to the idea of hereditary transmission.

Kooreah Homed, (No. 19,) Mussulman, ætat. 60, residing in Shertullay district, both hands and both legs affected, disease has existed 24 years, has been married 32 years, has five children, none of whom exhibit any symptom of it. Cooreyapah, (No. 37,) Hindoo, male, ætat. 40, left leg affected, wife had it before marriage, he contracted it ten years subsequently, has six grown up children, none of whom evidence any symptom of Elephantiasis. Mareca, (No. 58,) Syrian Christian, female, ætat. 49, left leg affected since she was ten years old, husband also affected, both had it before marriage, had one daughter now 22 years old, strong and healthy, with no indication of Elephantiasis. Rungun, Hindoo, (No. 96,) male, ætat. 45, both legs affected since childhood, father, mother and wife affected with it, has four grown up children, all free from any symptom of the disease.

These cases, and many similar ones might be quoted, militate strongly against the idea of hereditary transmission. It may be added that only three persons, out of the 900 questioned on the point, considered that they had inherited it from their parents.

I made particular enquiries in Shertullay, where the disease is so rife, and could not hear of a single instance in which it was congenital, no one had even heard of such a case.

Influence of food.—It appears extremely doubtful whether food of any particular kind exercises any marked influence on the production of Elephantiasis. If we turn to the table of castes, we shall see that Brahmins are not exempt, from which we may infer that a purely vegetable diet affords no protection against its invasion.

Deficiency of food, either in quantity or quality, does not appear to be regarded as a cause by the people themselves generally, only two out of 652 attributing it to this circumstance. Further doubt is thrown on this cause by the fact that for three years, 1853-54-55, Travancore, in common with the

greater part of Southern India, suffered a severe drought, and though thereby great want and suffering were entailed, on the poorer classes especially, I cannot ascertain that there was any increased prevalence of Elephantiasis during that period. The lower classes in Travancore are equally, if not more, comfortably housed and better fed than the same classes in the Honorable Company's territories, a fact which a stranger might not be led to expect from the untruthful statements which occasionally appear in some of the Indian newspapers.

From the fact of Elephantiasis generally prevailing in its greatest intensity on or near the sea-coast, it has become a prevalent opinion that fish, as an article of diet, may exercise a prejudicial influence; such an opinion, however, must be regarded as apocryphal. In the table of occupations, it will be seen that of 800 ascertained professions or callings, only 11 were fishermen, a class of persons who live almost entirely upon fish. On this point may be adduced, as an illustration, the village of Ananthapulpanaben near Covalum, nine miles from Trevandrum; it contains about 150 houses, situated on the sea-shore, the men of the community are almost all fishermen, fish constitutes the chief article of diet for the whole population, and yet there is not a single case of Elephantiasis in the village, nor in the immediate neighbourhood.

Contagion.—Not one of the many persons I have questioned on the subject, native doctors, patients, &c., seems to entertain the least idea of the disease being contagious, at least in its early stage. The fetid glairy discharge from the fissures in very advanced cases, they regard as acrid and dangerous, and as such, it is avoided, more however from the unpleasantness of the smell that accompanies it, than from any idea, that it is capable of communicating the disease. Several cases came under my notice of men who for years had been suffering from the malady in an aggravated form, who had not communicated it to their wives; and instances were met with of affected women, whose husbands, after years of married life, remained free from the disease. Out of the 930, who returned answers to the question whether they had any relations suffering from the disease, only 11 acknowledged to having husbands or wives similarly afflicted, considering the intimate relations of conjugal life, the proportion must have been much larger, had the disease been contagious.

Influence of Locality, Water, Vegetation, &c.—When I com-

menced the registration of cases of Elephantiasis at the Hospitals at Trevandrum under my immediate charge, I was struck with the large proportion of cases which came from the Northern parts of the Travancore territory. On investigation, I found that the disease was particularly rife in the Shertullay district and the neighbourhood, at Alleppee, Umbalapalay, &c.; indeed it may be said that its principal range, the site at which it attains its maximum of intensity, is the narrow strip of land, bounded on the West by the sea, and on the East by the Back-water, which on reference to the accompanying map, will be seen to extend from Cochin in 10° S. Lat. Southward to Quilon. The manner in which the disease is limited to this strip of land is very remarkable. As illustrative of its frequency at Shertullay, I may mention that, in a single day, that is from 6 A. M. to 6 P. M. I personally registered no less than 130 cases, in the *village* of Shertullay alone. At my request, Ramen Menoven, the Dewan Peishkar, who is resident at Shertallay, kindly ordered a Census or Return to be taken, shewing the total number of persons residing throughout the district who were affected with Elephantiasis. From this Return which is given, in extenso, in the Appendix (*b*), it will be seen that the number thus diseased, amounts to 2,133. The total adult population, in 1855, amounted to 48,591, which gives the proportion of the diseased to the healthy (in this respect) of about 1 to 21⅓ of the whole population! On the opposite, or land side of the back-water, the disease is comparatively rare; numerous cases, it is true, are met with at Vykum, Cottyam, &c., but the disease in these localities is by no means so common as on the Western side of the back-water. Going Southwards, we find the disease very rife at Alleppy, Umbalapalay, and other places along the coast as far as Quilon, where the Dresser informs me the disease is not so common. The Southernmost limit at which Elephantiasis appears to be, in so marked a degree, endemic is Eddavah, at which point commences a neck of land about six miles in breadth, separating the Quilon from the Trevandrum backwater. With the exception of this six miles of land, over the Vurkalay Hills, the whole journey from Travandrum to Cochin may be accomplished by back-water and canals. Three miles south of this neck of land is the town of Ajengo, situated in precisely the same relative position to the sea and back-water as Shertallay, *i. e.*, with the Sea to the West, and back-water to the East. Though, in olden times, the seat of

a large factory, it is now a poor town, containing about 2,000 inhabitants, and so rare is Elephantiasis there, that, after a diligent search for a whole day, though aided by the authorities, I could only find five cases altogether, and of these, one was of so doubtful a character that I omitted it in my list.

Proceeding Southwards we come to Trevandrum, situated three miles from the Sea coast, being the capital of Travancore, large numbers of persons from all parts of the country assemble here, and the population is said to be about 80,000. Of course, in such a congregation of persons, it is far from uncommon to meet with cases of Elephantiasis; the greater portion of them, however, come from adjacent parts; comparatively few, as far as my observation goes, originating at Trevandrum, or in its immediate neighbourhood. Going still to the South we come to Neyattankary, Coolithoray, Kulcolum, and Nagercoil, and the Vaccinators at each of these places speak of the disease as being of very rare occurrence, and the meagre appearance of their lists bore witness to the truth of their representations. At Nagercoil resides an intelligent Dresser, and, in a communication from him (dated January 1857,) he states that he visited with the Vaccinator no less than thirty-seven villages, the names of which he gives all within a range of twelve miles of Nagercoil, and that he could only succeed in finding *five* cases over the whole space traversed; a good illustration of its rarity in those parts. At Shencottah, a considerable town, situated on the Ghauts which divide Travancore from Tinnevelly, the Vaccinator and Tehsildar both state the disease to be unknown. If we draw an imaginary transverse line, midway through the Travancore territory, including Quilon in the Northern portion, we find that of the 945 cases 817 come from the North of that line., and only 128 from the South of it.

At Cohin, situated at the Northernmost limit of this strip of sand bank, it is well known that the disease is very rife. Dr. Pringle, in an interesting communication (dated 3rd February 1857,) states that, in that town, under the immediate vicinity, there is scarcely a house in which there is not one or more affected; but that in the interior, at a distance of ten or twelve miles inland, the disease is almost unknown.

The Shertallay district, in which the disease is thus in so remarkable a degree endemic, is, as was before mentioned, a mere sand-bank, varying from one to three miles in breadth, presenting some partly artificial and partly natural irregularities of the surface; of these the lower portions on which,

during the progress of years, during heavy rains, inundations, &c., alluvial deposits have accumulated, paddy fields have been formed, and on these good crops of rice are grown. The substratum to a great depth is sand, and in sinking wells no more solid foundation has been discovered. At Alleppy, on the same line of sand-bank, some years since a well was sunk, and at sixty feet the depth of soft mud appeared to take the place of sand. Laterite and granite, so common on the opposite side of the back-water, do not exist in this district.

General Cullen, the British Resident at Travancore and Cochin, has suggested to me whether the fall of rain or moisture of the atmosphere might not exercise some influence on the production of the disease in the district; the fall of rain at Shertallay and Ambalapolay averaging from 100 to 110 inches, whilst at Quilon it is only between 60 and 70 inches. The average fall of rain at Travancore, in ten years, is 65 inches.

The water generally used by the inhabitants is from low shallow pools or tanks, (few, if any, wells exist in the district,) and, for the most part, the water thus obtained, especially during hot and dry seasons, and after heavy rain, is vilely bad, almost black in colour, thick, opaque to the eye, and brackish to the taste. This is used alike for drinking and bathing, and for other domestic purposes.

Considering the sandy nature of the soil, a good deal of vegetation has sprung up. Some very large Peepuls, (*Ficus Religiosa,*) Jack Trees, (*Artocarpus Integrifolius,*) Cocoanut Trees, (*Cocoa Nucifera,*) *Thesperia populnea,* Physic Nut, (*Jatropha Curcas,*) *Hydrocarpus inebriens, Calophyllum Inophyllum,*) Screw Pine, (*Pandanus Odoratissimus,*) *Cerbera Odallum, &c.* Whilst, amongst the lower vegetation, the *Calotropis Gigantea,* the *Argemone Mexicana,* several species of *Ipomea, Cyperus, Tribulus Terrestris, Hydrocotyle Asiatica, &c.,* are to be observed. The inhabitants are generally in poor circumstances, and a Syrian Christian Mission having existed here for many centuries, a great proportion of the people belong to that religion.

To the enquiry amongst the people themselves as to the cause of the great prevalence of Elephantiasis amongst them, and in their immediate neighbourhood, the almost universal reply is that it arises from the use of water in which the fruit of the Caldera or Screw Pine (*Pandanus Odoratissimus*) has fallen, and has been for any length of time macerating, or into which the roots of this tree project. The water thus contaminat-

ed whether for drinking or bathing, is regarded as the chief cause of the disease. A belief in the baneful effects of the Caldera, is so prevalent amongst all classes throughout Travancore, that I was induced to pay particular attention to the point, and after giving it full consideration, I am inclined to regard it as a popular fallacy; or, at any rate, to consider that its ill effects have been greatly overrated. In no place perhaps in Travancore, is the Pandanus so plentiful as on the banks of the Trevandrum canal; it, together with the Cerbera Odallum, literally lines the banks on both sides of this canal for nearly twelve miles; its Pineapple-like fruit may at certain seasons be seen floating in every direction, and, when the water is low in the hot weather, the roots of this tree are seen projecting far into the canal,* and yet, as before observed, it is comparatively rare to meet with cases which have originated in this locality. It is true that the small tanks and pools of water at Shertallay are, for the most part, overshadowed by this tree; but it appeared to me that the water taken from other tanks overshadowed by other trees, as the jack tree, the Cerbera Odallum, Hydrocarpus Inebriens, &c., were fully as offensive to the sight, smell, and taste, as that from similar collections of water under the Pandanus.

It is impossible not to regard the water as one, if not the principal cause of the prevalence of the disease at Shertullay; the sea water, penetrating through the porous sand, renders the water saltish and brackish, and as the generality of these pools are surrounded by trees, it in addition soon becomes loaded with dead vegetable matter, which undergoing decomposition, renders the water dark, almost black, and highly offensive to the taste and smell. Even boiling aud filtering fail to deprive it of its unpleasantness; and it is impossible to disbelieve that the habitual use of such water must prove the source of a considerable amount of disease; and that these collections of decomposing vegetable matter do generate a powerful malarious poison.

One other source of malaria exists in the small patches of low cultivated land, the soil on which is almost entirely com-

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* General Cullen, who kindly perused this paper in MS., suggests that I am misled on this point, as, from his own observation, he states that the Caldera on the banks of the Travandrum canal, is a simple hedge, and of no depth in any part. The quantity of this tree at Shertallay *is*, according to his observations, extremely great.

posed of decayed vegetable matter. Towards the termination of the rains, and during the hot season, I was informed that these spots (as might be expected) emit a very strong effluvium, and knowing as we do the intimate connection between vegetable decomposition and the generation of malarious fever, we are not surprized to find it of so frequent occurrence in Shertullay.

Treatment.—In the few remarks which I have to offer on the treatment of Elephantiasis, it will be convenient to consider;—first that which is applicable to the acute stages or febrile paroxysm; and, secondly, that to be pursued during the intervals or intermissions.

When the cold stage, which usually precedes the appearance of the true pyrexial symptoms, has fairly set in, little can be done to afford much relief to the distressing sensations attendant on the severe shivering: the application of hot sand in bags to the Epigastric region, or over the region of the heart, and also to the extremities, occasionally appears to afford some relief, as also do frictions with the hand, especially along the spine. Stimulants and aromatics of various kinds, particularly the aromatic spirits of ammonia, given internally, are sometimes useful; and Mr. Anderson, the Apothecary at Alleppee, reports that he has frequently seen a drachm of powdered Columbo root in an ounce of gin, repeated according to circumstances, productive of considerable benefit. When the hot stage supervenes, saline purgatives, preceded by a mild mercurial, prove very beneficial, and with the view of allaying the vascular excitement, antimonials with diureties and diaphoreties should be administered. Effervescing draughts of the citrate of ammonia seem to allay the thirst and irritability of the stomach, more effectually than any other medicine. In order to relieve the heat, pain, and erysipelatous swelling of the extremities, recourse must be had either to hot or cold applications, whichever are most agreeable to the patient's feelings. Sometimes, hot fomentations and at others cold evaporating lotions appear to afford most relief. When there is much pain and inflammation, leeches along the course of the inflamed lymphatics, or around the enlarged lymphatic glands, may be had recourse to with advantage. Inunction of extract of belladonna, with or without mercurial ointment, along the line of inflammation, may be advisable in severe cases. Perfect rest in the recumbent posture must be insisted upon, during this stage of the disease.

During the sweating stage, no remedial measures are called for, but when this is about to terminate, whilst the distention of the extremity is still great, it is reported to me by several competent observers that a blister in the neighbourhood of the swelling, kept open for several days, has a very marked effect in hastening the reduction of the size of the limb: the quantity of the fluid which is drained off by this measure, is stated to be very great. Blisters form a conspicuous part of the treatment of the native doctors; but their rude vesicants, (Plumbago Zeylanica, P. Rosea, &c.,) from their imperfect action, are often productive of more evil than good.

The treatment to be adopted in the intervals or intermissions, may be divided into constitutional and local. First, with regard to the constitutional treatment. Whether we regard the disease to be a sequence of fever or not, the regular periodicity of the attacks would alone point to the class of medicines from which we may hope to derive the greatest amount of benefit. Amongst the remedies in use by the natives themselves, we find that arsenic, black pepper, and opium, all of them antiperiodics of no mean value, hold the highest place in their estimation; and more than one instance has fallen under my own notice, in which these remedies alone had warded off the periodical attacks of fever, for a considerable length of time. As observed in a preceding page, "no fever, no enlargement," is an axiom founded on the experience both of natives and Europeans. To antiperiodics, therefore, must we look for the means of effectually checking the disease; and of this class of remedies, none offers a prospect of better or more satisfactory results than the Sulphate of Quinine.

The mode of treatment which I have adopted, in my own practice, is to give the patient two powders with five grains of Quinine in each, with instructions that whenever any indications of the approach of a paroxysm present themselves, as blueness of the nails, anxiety, &c., one of these should be dissolved in water, and taken immediately, and the dose repeated in an hour after, should the indications not pass off. Perhaps it might be better to take the whole ten grains at once. These simple means certainly appear, in some instances in my own practice, completely to have warded off the attacks; but how far, by the continued use of them, we may permanently check the course of the disease, I am unable yet to say, as Elephantiasis is one of those constitutional or chronic diseases, in which it is extremely difficult (or at any rate injudicious) to speak with confidence.

I feel assured, however, that Quinine, properly administered, will prove the sheet anchor in checking the progress of this unsightly malady. In anæmic cases, it might be advantageously combined with the sulphate of iron. Quinine, however, from its high price, not being always available, other less expensive antiperiodics might be tried as arsenic, the sulphates of iron and of zinc, black pepper, the bonduc nut, the margosa bark, &c.: Warburg's drops, as a powerful antiperiodic, might prove beneficial. A steady course of iodide of potassium with sarsaparilla internally, together with some of the local measures mentioned subsequently, might be advantageous. In cachectic cases, Cod Liver Oil is a remedy of considerable promise.

Of all measures, not medicinal, the most effectual in preventing the accession, and checking the progress of the disease, is removal from a locality where Elephantiasis is endemic, to one where it is known not to exist. Any spot, especially if it be an elevated one, ten miles from the sea-coast, appears to afford almost certain safety from its attacks.

With regard to local treatment, during the intervals, the object is to reduce, as far as possible, the existing swelling and enlargement. With this view, a recent writer who has had much experience in Elephantiasis as it exists in the West Indies, Mr. Dalton of Demarara, (*Lancet*, vol. ii. 1846, p. p. 453, 499,) strongly advocates steady even bandaging with a strong broad roller; his remarks are well worthy of attention. Mr. Bascome, also an experienced West Indian practitioner, (*Lancet*, vol. i. 1846, p. 435,) advocates heated air medicated with sulphur, and friction with a horsehair brush, to stimulate the absorbents. Rayer and Lisfranc advocate scarifications along the course of the lymphatics; and Biett, in addition to bandaging, advises friction with iodide of potassium ointment; (ʒss. ad Ung. Simp. ℥i.) and local vapour baths.

My own experience is strongly in favour of iodised oil. Cocoanut oil four parts, iodine one part, and iodide of potassium one part, this I direct to be steadily rubbed in for a quarter of an hour, night and morning, and the limb or part to be then enveloped in an oil silk or wax cloth or even flannel bag, to prevent evaporation, and retain the moisture. In the place of oil, however, I would strongly urge the substitution of glycerine, which, while it permeates the skin more thoroughly than oil, longer retains moisture, and more completely softens the tissues to which it is applied. From the iodized

glycerine, lately proposed in some skin diseases, I should anticipate the greatest benefit. It is formed by dissolving one part of iodide of potassium in two parts of glycerine, and turning this upon one part of iodine, which is thus completely dissolved. (*Pharm Journ.*, vol. xvi 1856, p. 336.) The bromide of potassium ointment (℥i of the bromide to ℥i of lard) might perhaps prove a valuable local stimulant and absorbent.

In those cases where ulcers or fissures exude a fetid fluid, a chloride of soda or zinc lotion proves useful, not only correcting the odour, but stimulating the surface to a healthy action.

In extreme cases, (after a fair trial of other local and constitutional remedies) amputation may be necessary—but it appears to me that to resort to this extreme measure, is worse than useless, if the patient remains in, or is permitted to return to a locality where the local exciting causes of Elephantiasis are in full force. Under such circumstances, the disease will probably re-appear in some other part, unless, indeed, remedial measures, as quinine, &c., are adopted to ward off subsequent attacks of fever.

I have thus endeavoured to sketch the history of Elephantiasis as it exists in Travancore; and, in conclusion, I would beg to apologise for the great length to which this paper has extended; but, as the enquiry proceeded, new matter was constantly presenting itself for consideration, which it would not have been justice to the subject, to the profession, nor to myself, to have omitted. It still contains many shortcomings and omissions, for which I would crave indulgence. Should any Medical officer, from its perusal, be induced to make trial of quinine as a means of controlling this unsightly malady, it is hoped that he will communicate the result, whether favourable or otherwise, to his profession, through the pages of the "Indian Annals of Medicine."

APPENDIX A.

A Short Account of Elephantiasis.

From a Sanscrit Work entitled "Ushta-wunga-hrethayum," written by Vawheda, a Sanscrit Physician.
(Kindly translated for this Paper by Raja Raja Vurmah Cochoo Coil Tambooran of Travancore.)

This disease has two Sanscrit names Sleepathum and Padaval-meekum.

The former term is the one most commonly employed, and under it, is comprehended the peculiar enlargement of the legs and feet, and sometimes also of the hands. Some philosophers say that this swelling attacks the nose, ears, and lips, but such cases are of very rare occurrence.

Causes.

1*st.*—Frequent walking with bare feet over sandy tracts of land, which are intersected with swamps or watery places.*

2*nd.*—The use for drinking purposes, of water from tanks which are covered on their bunds or banks with the Caldera plant (*Pandanus Odoratissimus*).

3*rd.*—Constant exposure of the head and body to violent damp, as dew, &c.

Original Symptoms.

Previous to the attack of this disease, the patient is generally disturbed with head-ache and fever; this latter does not generally last more than three days, and on the second or third day the swelling will make its appearance on the feet, and on the fourth day, the patient will be free from all inconvenience, with the exception of a little swelling of the feet, and that also without much pain. The fever and head-ache recur once or twice a month.

The result of this periodical fever will be the gradual increase in the swelling of the feet.†

There are three kinds of Elephantiasis:—1st, that caused by wind; 2nd, that which arises from derangement of bile; 3rd, that from phlegm.

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* This corresponds closely with the surface of the Shertallay district.

† The reader who has perused the preceding pages of this paper will see how closely this sentence is in accordance with the facts adduced.

1*st.*—That which is caused by wind. In this form of the disease the swelling is black, painful, hard, and without smoothness, the skin being covered with cracks or fissures.

The remedies held most highly in esteem are as follow : the local application of any liniment which is ordinarily serviceable in rheumatism, the leg being, at the same time, exposed to the steam of hot water, (local vapour bath.) The leaves of the castor oil plant (Ricinus Communis,) of the Datura, (Datura fastuosa,) and of the cotton shrub, (Gossypium herbaceum,) boiled with a little common salt, are to be locally applied to the enlarged limb, so tied on as to be held in contact with the skin during the whole night. Blood-letting from the vein two inches above the ankle is advisable. For internal use, half an ounce of castor oil with the same quantity of cow's urine, is to be taken every day for one month, and four hours after each draught, the patient must take old paddy rice boiled with decoction of ginger. On the failure of these remedies, the vein above mentioned must be cauterized with a piece of hot iron.

2*nd.*—*That arising from derangement of the bile.* This is distinguished from the former, by its yellow colour, by the greater heat of the swelling, and by an internal burning sensation over the whole body.

The treatment for this variety consists in the use of all those remedies which are deemed efficacious in bilious affections generally.

Blood-letting is also an unfailing remedy ; but in this case it must be drawn from the vein two inches below the ankle.

3*rd.*—*That which is caused by phlegm.* In this variety the swelling is heavy, smooth, painless, larger than either of the preceding, soft and covered with several small fleshy tumours all over the feet. After the lapse of about a twelve month from the period of its first appearance, the swelling becomes rheumy or moist, after which it is incurable ; therefore the sensible physician should not undertake to treat this case, for his efforts will prove ineffectual.

The treatment is as follows : At the commencement of the swelling, blood-letting from the vein of the toe should be employed. A decoction of the yellow myrobolanus (Terminalia Chebula) with honey must be taken daily, and the dose of it gradually increased. During this treatment barley rice (?) should be the only food. The following application is very efficacious. Take of mustard and of the root of the brinjal or egg plant (Solanum Melongena) equal parts, grind them together, and apply over the surface of the leg.

APPENDIX B.

Return showing the number of persons affected with Elephantiasis, within the limits of the District of Shertulaly, ni 1857.

CASTES.	About 10 years of age.		About 20 years of age.		About 30 years of age.		About 40 years of age.		About 50 years of age.		About 60 years of age.		Total.		Cause of the Disease.	Swelling on one leg.		Swelling on both legs.		Swelling on one hand.		Swelling on both hands.		Swelling on both the legs & hands.		Total.		Fever once a year.		Fever twice in a year.		Fever three times in a year.		Monthly Fever.		GRAND TOTAL.
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
Brahmin, ...	0	0	0	0	0	0	4	1	2	1	0	0	6	2	Fever,	4	1	2	1	0	0	0	0	0	0	6	2	1	0	3	1	1	1	1	0	8
Kshettria, ...	0	1	1	0	2	0	4	3	0	0	0	0	7	4	,,	4	1	3	3	0	0	0	0	0	0	7	4	2	1	3	1	1	1	1	1	11
Ambulavasy,.....	0	0	15	4	8	2	6	4	9	5	4	1	42	16	,,	15	5	20	11	1	0	2	0	4	0	42	16	15	2	10	3	15	4	12	7	58
Soodra, ...	25	8	33	12	114	45	134	67	87	34	17	11	410	177	,,	151	82	190	50	19	5	10	7	40	33	410	177	25	12	85	28	172	80	128	57	587
Chitty, ...	5	2	14	5	22	7	13	4	9	3	5	2	68	23	,,	38	10	20	8	2	1	2	2	6	2	68	23	18	3	20	5	16	7	14	8	91
Thuttan, ...	0	0	0	0	7	2	11	3	5	4	0	0	23	9	,,	12	4	8	3	1	0	0	0	4	2	23	9	4	2	6	3	10	2	3	2	32
Kongany, ...	0	0	3	0	4	2	7	4	4	3	0	0	18	9	,,	8	2	6	3	2	1	0	1	2	2	18	9	2	1	4	2	6	2	6	4	27
Coodoomicar, ...	9	2	13	4	7	2	5	3	6	5	0	2	40	18	,,	20	8	12	4	2	0	3	0	3	6	40	18	5	3	15	5	8	4	12	6	58
Syrian Christians,...	0	0	15	6	40	14	53	12	44	10	27	8	179	50	,,	80	20	60	18	9	2	8	2	22	8	179	50	19	10	60	15	40	10	60	15	229
Mahomedans, ...	0	0	5	1	9	3	13	4	6	4	5	2	38	14	,,	18	8	10	2	1	0	2	1	7	3	38	14	4	2	10	3	5	4	19	5	52
Ealoovah, ...	13	4	37	19	82	37	121	50	72	24	49	23	374	157	,,	150	50	130	60	14	8	10	2	70	37	374	157	20	7	120	30	80	30	154	90	531
Valen, ...	2	0	5	2	7	4	5	3	6	3	0	0	25	12	,,	15	6	6	2	0	0	1	1	3	3	25	12	5	2	6	3	4	3	10	4	37
Vunnan, ...	4	3	9	6	13	7	18	11	12	5	7	3	63	35	,,	28	15	20	10	6	2	4	2	5	6	63	35	10	5	13	6	18	10	22	14	98
Marracars, ...	5	2	13	4	17	5	10	6	9	4	11	7	65	28	,,	25	10	22	8	6	2	3	1	9	7	65	28	5	3	10	5	20	8	30	12	93
Vanlen,.....	2	0	9	3	13	4	4	2	5	3	9	7	42	19	,,	13	7	10	6	2	1	3	2	14	3	42	19	4	1	8	4	14	4	16	10	61
Poolayen, ...	0	0	7	2	5	3	9	3	11	7	9	5	41	20	,,	21	9	10	6	0	0	0	0	10	5	41	20	5	2	6	3	12	5	18	10	61
Parrayen, ...	0	0	2	0	4	1	3	2	5	1	2	0	16	4	,,	7	3	9	1	0	0	0	0	0	0	16	4	2	1	4	1	6	1	4	1	20
Oollaten, ...	3	1	5	2	6	4	7	2	5	3	0	0	26	12	,,	7	4	15	3	0	0	0	0	4	5	26	12	3	1	5	4	4	3	14	4	38
Paundicars, ...	0	0	4	1	7	3	5	2	11	6	2	0	29	12	,,	15	7	10	3	0	0	0	0	4	2	29	12	3	2	7	3	6	3	11	4	41
Total,.....	68	23	190	71	367	145	432	186	308	125	147	71	1512	621		631	252	563	202	65	22	48	21	207	124	1512	621	154	60	395	125	438	182	535	254	2133
	91		261		512		618		433		218		2133			883		765		87		69		329		2133		214		520		620		789			

Total population in 1855, ... 48,591 ..... Males, 24,924 ..... Females, 23,667

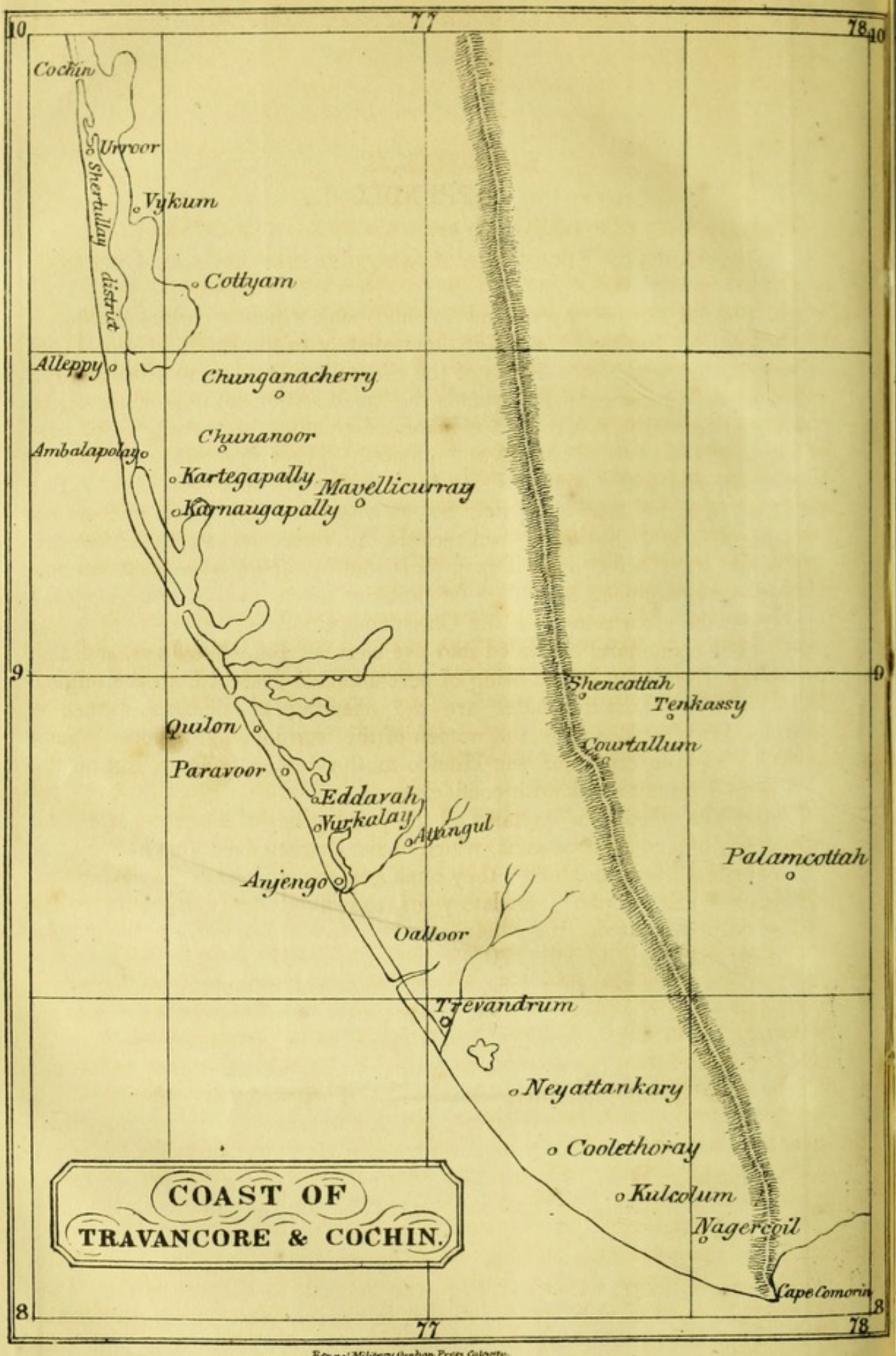
Affected with Elephantiasis, in 1857,... 2,133 ..... ,, 1,512 ..... ,, 621

Proportion of whole population affected, 1 in 21¼

,, Males ,, ,, 1 in 16½

,, Females ,, ,, 1 in 38½

E. W.



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APPENDIX C.

Statistics of Elephantiasis amongst the Jews at Cochin.

On the narrow slip of land or sand-bank which separates the back-water from the sea (*vide* Map) immediately to the South of the Town of Cochin, and to the North of the Shertallay District, so often referred to in the preceding pages, stands the small settlement of Jews-town, so called from the fact that it is inhabited chiefly, if not entirely, by persons of the Jewish nation and religion. The origin and early history of the Jews of Cochin is involved in considerable obscurity. The Cochin Sircar records contain notices of grants, &c., made to them six centuries ago, but their own records, preserved on sheets of copper, would place them on that spot, it is said by those who have investigated the subject, at a date far anterior even to this, it is supposed about the sixth century of the Christian era.

The community is divided into two classes : 1st, white Jews, and 2nd, black Jews : the former being of pure unmixed descent from the original founders, whilst the latter are the offspring of alliances formed by the Jewish males with the women of the surrounding nations. Some may be converts from the Hindoo to the Jewish religion, but on this point I cannot speak with confidence.

"The white Jew" retains all the peculiarities of his race, the same dress, habits, and customs, which have characterized this nation in all ages and in all countries ; they remain in the strictest sense of the word "a peculiar people." Of late years, the number of the population has greatly decreased ; the whole number of white Jews, at the present day, amounting to only 170 persons. Although in any thing but affluent circumstances, they have for the most part comparatively comfortable pucka dwellings, they are not generally subjected to great privations, nor are they exposed to the vicissitudes and inclemencies of the weather. Fish does not form their principal article of diet, meat and poultry constituting their chief food. The water in common use is chiefly from wells, and is stated not to be brackish. In the immediate neighbourhood of the settlement are many swamps, which are likely to generate miasma. Of the 170 white Jews, of both sexes and of all ages, 14 individuals, or 1 in every $12\frac{1}{7}$, are affected with the Elephantiasis.

"The black Jews" at this station amount in number to 249 ; of these, 15 persons, or 1 in $16\frac{3}{4}$, are subject to Elephantiasis. They differ from the white Jews, chiefly, in not inhabiting such comfortable dwellings, in being in poorer circumstances, and in subsisting principally on fish, excluding those which are furnished with scales.

Taking the whole community of Jews at this settlement, White as well as Black, we have a total population of 419, *of whom* 29, *or* 1 *in* 14½ *nearly, present evident marks of Elephantiasis.*

Another community of black Jews is located at Ernacollum, a large native town situated on the main land, *i. e.*, on the East or land-side of the back-water: it is separated from the Jews-town at Cochin by the back-water, which at this point is about three or four miles in breadth. The water at this place, both from wells and tanks, is reported to be of good quality. Fish (without scales) form the principal articles of diet. *Of this community of Jews, consisting of* 353 *individuals, only* 3, *or about* 1 *in* 114, *are affected with Elephantiasis.*

A third community of Jews (black) exists at Chennamungalum in the Cochin Territory, about 25 miles North-East of the Town of Cochin, and about 5 miles inland. It is situated on the banks of a river, from which (and also from wells in the hot weather,) good water is obtainable. There are no swamps in the neighbourhood, nor any collections of decomposing vegetable matter: but I am informed that during the heavy rains, the banks of the river are occasionally overflowed, and the place inundated. *Of the* 64 *Jews there located, not a single case of Elephantiasis exists.*

The above statements may be thus summed up :—

	Population.	*With Elephantiasis.*	*Proportion.*
Jews at Cochin, on the West side of the back-water, ...	419	29	1 in 14½
Jews at Ernacollum, on the mainland or West side of the back-water, ...	353	3	1 in 114½
Jews at Chennamungalum, five miles inland, ...	65	0	0 in 0

The above figures and statements are based on a most excellent Report, obtained for me from the Jewish Authorities by Vencata Row, the Dewan of Cochin.

The bearing of the facts adduced in this Report on the facts detailed in the body of this paper, is too evident to need further comment.

E. J. WARING.

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