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*EDITED BY THE HONORARY SECRETARY.*

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"The design of the Society is to institute and promote inquiries into the History, Religion, Literature, Arts, and Social Condition of the present and former Inhabitants of the Island, with its Geology, Mineralogy, its Climate and Meteorology, its Botany and Zoology."

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# ROYAL ASIATIC SOCIETY, CEYLON BRANCH.

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## PROFESSOR VIRCHOW'S ETHNOLOGICAL STUDIES ON THE SINGHALESE RACE.

*Read before the Anthropological Society of Berlin, January 17, 1885.*

TRANSLATED BY W. R. KYNSEY (FELLOW KING  
AND QUEEN'S COLL. OF PHYSICIANS) AND J. D. MACDONALD, M.D.

*(Read February 13, 1886.)*

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AT the time when I wrote my treatise concerning the Veddás of Ceylon, and their relations to the neighbouring races, it was not possible for me to obtain a single satisfactory scientific description of the principal race of the Island, viz., the Singhalese. What I was able to ascertain concerning them is stated on page 60 and the following pages.\*

My disappointment was great at not seeing the large caravan which Herr Hagenbeck brought to Europe in 1883.

At the sitting of the Paris Anthropological Society, of October 18, 1883 (Bulletins, page 713), M. Manouvrier made an official report concerning that company, the meagreness of which is even acknowledged by the author himself, who explains it as due to want of courtesy on the part of the leader.

Last year another caravan visited the country, and I consider myself fortunate in finding it still here on my return

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\* Of his former treatise on the Veddás.

to Berlin. Herr Hagenbeck himself had the kindness to give the necessary instructions, so as to facilitate my examination. After his departure Herr Von Schirp had the kindness to bring the people before me one by one. Notwithstanding this, I was only able to examine a small number of the forty persons of which the company consisted. There was all the preparation of their approaching departure going on, and I must say, like the Paris Commission, that the time spent in obtaining my results was too short. Besides, the determination of personal relations was surrounded with much difficulty. At first I was informed that with the exception of some dancers from Hindústán, the whole company was of Ceylon origin, and that of the latter, two, viz., Pichchai and Murugappa, were Tamils. Both, I was informed, belonged to a suburb of Colombo. Later, however, I ascertained through the interpreter (who said he himself was born of European parents in Ceylon) that the Tamils in question belonged to the neighbourhood of Bombay.

Herr H. Becker ("Cinghala and the Sighalese, the Land and the People of Ancient Paradise": Frankfurt-on-Maine, page 18), who wrote a not sufficiently trustworthy description of the same people, says that Murugappa came from Madras, and Pichchai from Negapatam, south of Madras. Whatever the truth may be, the hope to see Ceylonese Tamils face to face proved a delusion, and the zeal with which I engaged in the examination of this rarity influenced not a little my further proceedings.

Of the Sighalese proper, I chose two groups. As representing the first group, I chose the following:—

1. A little three-year old boy called Jimmy (Sinni), who with justice had become the favourite of the public; stark-naked, with the exception of a silver fig-leaf, he tumbled unweariedly, and in constant good humour, about the arena.

2. His mother Lúsa (Louise?) Nóna, about twenty-five years old; his father Girigóris, or Grigóris Appu, twenty-

nine years old ; his mother's sister, Igga Nóna, sixteen years old ; and his mother's brother, Andre Appu, twenty-one years old.

Herr Becker had made three families of these. A *Nóna* family, an *Appu* family, and an *Appuhámi* family. Nay, he went a step further, in taking Abuhámi for an Arab, or, as they say in Ceylon, for a Moor. I must leave it undetermined whether the man was called Appu or Abu. The name sounded to me almost like Appu, and Herr Kotelmann writes it so ("Magazine of Ethnology," 1884, page 165). There was no difference of opinion, however, concerning the family connections of the group.

For the second group I made choice of two of the tallest and strongest men. Both were Kúruwe (elephant-drivers) from Kandy, viz., Puñchi Baṇḍá, twenty-four years old, and Ukku Baṇḍá, twenty-two years old. Herr Becker has given a photograph of the latter. Becker is inclined to suppose a mixture of Malabar blood in these, on account of their size ; but I would refer to my treatise (pages 60-64), where I have quoted the evidence of the best observers, Davy, Cordiner, and Sirr, according to which the Kandyans differ from the rest of the Singhalese by their greater strength, darker colour of skin, and better growth. Our Kúruwe may, therefore, be considered as the representatives of the highland type, as the members of the Abu Nóna family that of the lowland type.

In how far these represent the pure type must be left undetermined, in view of the differences of my former craniological examinations, and of the strongly prominent individual peculiarities appearing in the persons before me. The Paris Commission, whom the same difficulty faced, had come to the conclusion that the persons brought to Europe were taken from a very mixed portion of the population, and contained a large mixture of Malabar blood. I shall refer to this again, after I have discussed the principal peculiarities ; but will here observe that I have come to no sure conviction

on the point. In my former works I had come to the conclusion from the reports before me, that "the Sinhalese belonged to a dark, or more correctly, a brown, smooth-haired race, not prognathous or moderately so" (page 65); and this has been confirmed in the numerous persons by whom we were visited.

As far as the colour of the skin is concerned, the Paris Commission had found that the darker portions corresponded to No. 28 of the colour table; the lighter lay between No. 22 and No. 43.

According to the table of the Stenochromic Society, the colour at the bend of the elbow in one man was determined at the letter *g*, in the second transition stage from cinnabar to greenish orange, and that of the breast of a little girl at *i* orange.

I found in the family of Abu Nóna the following:—

1. The father Girigóris showed a dark brown colour: on the brow 28—Radde 3 *g*; on the cheek 21—Radde 4 *k*; on the breast 29—Radde 3 *g*; on the hand (back) 28–29—Radde 2 *e*; palm 30–31—Radde 4 *o* approximately.

2. The mother's brother Andre: brow Radde 3 *j*; cheeks Radde 4 *h-i*; breast Radde 3 *h*; back of the hand 28–29; the fingers Radde 30 *d*; putting the skin on the stretch Radde 3 *h*, palm 26. The deep colour of the breast was on the whole reddish, but still with a strong shade of yellow.

3. The mother Lúsa Nóna: brow 30–31—Radde 4 *i*; face 32–33; breast 29–30—Radde 3 *i-k*; back of hands 22–37—Radde 4 *h-3 h*; palms 24. In these are shades of unequal lightness.

4. The mother's sister Igga: very light, back of hands 29.

5. The little Jimmy (Sinni): breast 29–30; arm Radde 3 *f*; face lighter, more yellowish brown.

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NOTE.—I may observe that according to Radde, 1 cinnabar signifies 2 cinnabar in the first, 3 in the second transition towards orange, 30 carmine in the transition towards cinnabar.



Of the Kúruwe, of Kandy :—

1. The older, Puñchi Baṇḍá : on the brow Radde 30 *i*; on the cheek Radde 30 *k*; on the arm 29—Radde 3 *f* and Radde 10; on the palm 30–31—Radde 3 *e*.

2. The younger, Ukku Baṇḍá : face 4 *k*; breast 28–29; arm (inside) 29–30—Radde 3 *i*, (outside) Radde 2 *e*; dorsum 28–29; palmar 31.

These are chiefly shades of colour which, according to Radde's scale, belong to orange (4), and to cinnabar in the second stage of transition to orange. Next follow some cases in which cinnabar in the first stage of transition to orange (2), or carmine in the second stage of transition to cinnabar (30), was determined.

There is some interest in comparing the two persons from India :—

1. Murugappa, thirty-two years old : brow 29—Radde 3 *g*; breast 27–28; dorsum of hand likewise—Radde 30 *b-c*; palmar surface 31–32—Radde 4 *g-h* and 3 *g-h*. The nails are light and short. The shades of colour belong to the mixture of cinnabar with orange, of carmine and of orange. On putting the skin on the stretch, an underground of a yellowish colour appears, with black specks and stripes. On a simple inspection, the impression of a reddish tone of colour is imparted.

2. P chchai, nineteen years old : face 21—Radde 4 *h*; breast 43—Radde 4 *f*; dorsum of hand 28—Radde 2 *f*; palm 26—Radde 4 *k*.

In these appear no other colour than that occurring in the Ceylonese, and here also orange (4) dominates. Still, there is not wanting the transition stage of cinnabar to orange (2 and 3) and from carmine to cinnabar (30). I cannot therefore say that I found in the colour of the skin any different shades of colour not found in the skin of the Ceylonese. If the former, for example, show a much darker shade of skin than the Kandy men, still it must not be overlooked that even the Ceylonese among themselves show different degrees of darkness and fairness in their skins.

Lúsa Nóna had much lighter shades of colour than her husband and her brother. For example, I noted for Girigóris 3 *g*, for Andre 3 *h*, for Lúsa Nóna 3 *i*, therefore at the time one degree lower (clearer), whereas Pichchai (4 *f*) showed a degree higher (darker) than Girigóris.

In Ceylon the opinion prevails that the Tamils are distinguished by a darker skin than the Siphalese. But when Davy asserts that the colour of the skin of the Siphalese varies from light brown to black, it must be clear that the difference cannot be constant. Percival expressly declares that the colour of Siphalese women approaches the yellow, and even Cordiner asserts that the colour of the higher classes is quite as light, or even lighter, than that of brunettes in England. One may perhaps infer from all this that the variation of colour of skin among the Siphalese is even greater than among the Tamils, and that a larger number of persons with a small amount of pigment in the skin occur among the Siphalese; but a means of distinguishing the dark Siphalese from the Tamils is not to be looked for in the skin colour alone.

I would like finally to remark that the assertion of Cordiner, that the palmar surfaces of the hands and feet of the Siphalese of all classes are uniformly white,—an assertion also found in Selkirk,—has not been quite corroborated in our Siphalese. The palms of the men show 30–31, of the women 26–24 of the Parisian colour table, therefore quite clear shades, yet still plainly pigmented. The man from Madras or Bombay, viz., Pichchai, had likewise No. 26. Yet it must not be forgotten that the Parisian colour table leaves lacunæ, and that the determination of Radde's tables give different values: for example, for No. 30–31, at one time R. 3. E., at another time R. 4. 0.

The colour of the hair was fixed by the Paris Commission, No. 48 of the table, *i. e.*, as pure black. In fact, the richly developed heads of hair of the men, woven long and gathered at the back or side of the head into a knot (*kondé*),

has an ebony tone of colour in all, only in the case of Ukku Baṅḍá it had a brownish appearance, was at the same time slightly curly, whilst it otherwise looked flattish, and at the most somewhat wavy towards the points. With Jimmy (Sinni) it was quite black. The careful attention paid to the hair in the way of washing, combing, and oiling, contributes not a little towards increasing the favourable impression made by it.

Hair was also richly developed on the upper portions of the body. This was especially true of the eyebrows and the eyelids, whilst the beard in the case of the men was not thick, and in several was somewhat curly.

On the other hand, the older men had hair richly developed on the body, a fact which the Paris Commission had also noted. It said: "The rest of the body was remarkably covered with hair, the breast and the hollow of the spine in particular presented, in the case of the oldest men, true tufts of hair somewhat curly and several centimetres long."

I give here shortly my notes of each person examined:—

1. Lúsa Nóna: Hair strong, black, quite smooth, only at the ends somewhat wavy, slung in a knot behind; eyebrows strong; eyelashes long and thick.

2. Igga Nóna: Hair quite black and smooth; only a few wavy "love locks" before the ears. The hair descends far on the brow, so that a large portion of it (brow) appears black through short hairs. There is a soupçon of a moustache on the upper lip.

3. Andre Appu: Hair quite black, 30 cm. long, and throughout slightly waved; eyebrows strong, quite black, and shining; eyelashes long and thick; beard on chin and lips more richly developed; hair somewhat wavy.

4. Girigóris Appu: Hair long and black, stretched back over the head and held by a comb, gathered up in a knot behind; moustache and beard on chin somewhat sparse and wavy.

5. Jimmy: Quite black, short cut, thick rough hair.
6. Ukku Baṇḍá: Hair long, black, with brownish shade, curly, gathered in a knot; eyebrows moderately developed; eyelashes short.
7. Puñchi Baṇḍá: Hair long and wavy, gathered in a knot behind; black beard, thin, but long and somewhat wavy; breast and arms strongly covered with hair.

I add here also the results of the examination of the two Indians:—

1. Murugappa: Hair smooth and black, cut short in front, slung in a knot behind; beard thin, but individual hairs strong; breast and abdomen covered with strong and long hair.
2. Pichchai: Hair quite black, drawn back tightly, scarcely wavy; eyebrows strong; eyelashes long; moustache black and strong; whiskers moderately strong.

On microscopic examination I find that in the hair of the Sinhalese there is, without exception, almost a complete failure of, or an extremely diminished, medulla. On transverse section a very small central pith is occasionally observed, generally not greater in diameter than a blood corpuscle, and quite colourless; only sometimes, as, for example, in the case of the little Jimmy (Sinni), this narrow strip of medulla is pigmented. The peculiar colouring matter of the hair lies in the fibrous portion, and strongest in the superficial parts. Only the outermost layer (cuticula) is quite colourless and homogeneous. The colour, which is due to particles of pigment arranged lengthwise in stripes, varies very considerably. In many of the hairs observed lengthwise the colouring particles appear quite black, and also on cross section the particles appear almost pure black, whilst in other cases the external particles appear of a brown colour, and the cross section of same show light brown, nay sometimes yellowish-brown particles. This is the case with Lúsa Nóna and her brother Andre Appu, although their hair, on microscopic examination, appeared a pure black. Even in Ukku Baṇḍá the microscopic colour is brownish.

I must also add here that Tamil hair, which I obtained through the good offices of Herr Freudenberg, the German Consul, and from Dr. Kynsey, has the same characteristics. In four of the examples, one shows a light yellowish-brown, one a light greenish-brown, a third a dark brown, and only one a pure black pigment. In the case of one Malabar I found, besides black hair, also brown.

The form of the cross section in the case of the Siphalese is either quite round or slightly compressed on one side, so more or less kidney shaped. This is very distinct in Ukku Baṇḍá. The hair of the women is finer, but very dissimilar in thickness. On the whole, the hair of the Tamils appears to me, on comparison, darker, somewhat stronger; yet even in their case the thickness, as well as the shape of the cross section, varies in the same individuals in a similar manner as amongst the Siphalese. The Paris Commission determined the colour of the iris partly at No. 2 of the table, and partly between 5 and 3 *d h*, more or less dark brown. I can corroborate this, only that I also noticed nut-brown eyes, as did Davy before me. The iris of Lúsa Nóna corresponded to No. 3 of the table, whilst her brother Andre showed the dark brown colour of No. 2. Really black irises as noted by Sir Davy and Cordiner I have, like Herr Kotelmann, never seen. I consider that they never occur. Cordiner asserts that the white of the eye appears strikingly clear, and I can corroborate this in the case of children and women, yet the men had invariably yellowish-brown pigment in the conjunctiva, especially in the middle layer. In Andre and Puñchi Baṇḍá, I noticed light brown specks. The same occurred also in the Indians, of which Pichchai showed a moderately dark brown; Murugappa, on the contrary, a somewhat variegated iris, which externally showed a dark brown, internally a light brown zone, and between these zones a light yellow ring. Further, the eyes of the Siphalese appeared generally large and brilliant, somewhat elongated in the case of the men, more round in the women and children.

The interorbital distance was small, a fact also noted by the French Commission. The distance in the case of the women was 31 mm., in the men from 34 to 35 mm., whilst in the Indians it amounted to between 37 and 39 mm. The length from canthus to canthus measured in the women 30 mm., in the Appu group of men 55 to 57 mm., in the Kandyans 62 to 64 mm.

Of the Indians, Murugappa measured 30 mm., Pichchai only 55 mm. Both showed a somewhat elongated, almost narrow, still straight, palpebral opening. Concerning refraction, sharpness of vision, and colour blindness, Herr Kotelmann has given details.

I now come to the shape of the head. From the tables attached it will be seen that of the seven Sighalese, there were:—

Two brachycephalic, four mesocephalic, one dolichocephalic.

Brachycephalic were Lúsa Nóna (82·7) and her brother Andre Appu (83·5); dolichocephalic, on the contrary, her husband Girigóris (72·3). Next to him stand among the mesocephalic the sister Ipga Nóna (75·8); whilst the little son Jimmy (79·6) must be classified among the brachycephalic. The average cephalic index for the whole family may be set down at 78·7, the same mesocephalic number which was obtained from all the seven measurements. The Paris Commission (Dep. 719) measured seven men, five women, and two children. Among these fourteen persons none were dolichocephalic, eight were brachycephalic, six were mesocephalic. As also here among the mesocephalic a high index number appeared, it follows that the average is brachycephalic, viz., 81·9. Both averages, that of Berlin and that of Paris, approximate each other, but it must be distinctly remembered that they were obtained from different persons.

These results stand in strong contrast to those obtained from any examination of Sighalese skulls hitherto made. I have described these in my treatise (page 73 and the follow-

ing) in detail, and with every care. After eliminating all doubtful skulls, I had fourteen left. These had a mean index of 71·8, a distinct dolichocephalic measurement; nay, there was not among them a single brachycephalic, not even a mesocephalic skull. On account of this peculiarity I refer here to my writings, and I have no reason to doubt the correctness of the results then obtained. The results obtained by the measurements of skulls of these living persons cannot be made to agree with those obtained by me from the skulls formerly measured, even making all reasonable allowances and corrections.

There remains a want of agreement not to be for the moment reconciled. Either the type of the Sighalese skull is not dolichocephalic as I assumed, or the living Sighalese, even including Girigóris Appu, were not pure Sighalese.

The latter appears for the moment more probable than the former, because in the first place it is difficult to explain where these Ceylon dolichocephalic skulls could have come from if they were not Sighalese, as I have already proved (page 91) that the mean cephalic index of Tamil skulls from Ceylon hitherto examined is mesocephalic, viz., 76·3. If one therefore were inclined to conclude with the Paris Commission that these persons were fair Tamils (Malabars), a more satisfactory explanation would be obtained.

Now, however, I would accept such an explanation with the greatest reserve.

The opinion that the Sighalese is a mixed race is very old, and a descent from the Malays and Mongolians has been surmised. More details on this point will be found in my treatise on the Veddás, on page 110 and following pages. I will only add that should in reality a large portion of the Sighalese turn out brachycephalic or high mesocephalic, the question of the relations with Indian races would acquire a greater significance than I have been hitherto inclined to accord it. Discussing the examinations of the

Chittagong races made by Herr Riebeck, some considerations of this kind occurred to me. (His travels will shortly appear.)

A second point of difference appears in the auricular index. From the appended tables, it can be seen that only dolichocephalic Girigóris and the low mesocephalic Igga offer a smaller number for the auricular index, the former 60.6, the latter 64. All the other Siphalese have high numbers, the highest Lúsa Nóna (72.6). One may therefore conclude that the majority of the persons are hypsocephalic. This also corresponds more with earlier numbers (pages 92-140) found by me in Tamils, than with those for Siphalese.

A third point is the breadth of the brow, which, making all allowances for the fleshy portion, is, in all the Ceylonese measured by me, more considerable than any measured in Siphalese, and even in Tamil skulls.

Whilst the highest measurement of the skulls only amounted to 93 mm., the lowest measurement among the living was 98 mm. (Lúsa Nóna), and the highest 109 mm. (Puñchi Baṇḍá). This great breadth of brow contributed not a little in improving the appearance of the persons in question. In the Kandy people the forehead was high, from 70 mm. to 75 mm.

Girigóris was 67 mm., and Andre only 55 mm., less than even the women showed (58 mm. and 59 mm.).

As far as the face is concerned, I have confirmed the opinion that the Siphalese are not prognathous. With the exception of one woman, they were all orthognathous, and had a small mouth, although the lips were full and the front teeth large. In several it seemed to me the lower lip was comparatively strongly prominent, whilst the teeth showed a peculiar mother-of-pearl brilliancy, in which a loss of enamel forming a hollow in the crown occurred. I looked upon this at first as artificial, but according to their own assertion it arises spontaneously. It seemed to me, however, as if the mode of cleansing their teeth caused this loss of enamel. I add here a few special particulars:—



1. Ukku Baṇḍá: Mouth small, 50 mm.; lips full, but only moderately prominent, mostly the underlip, which looks bluish internally, but does not allow any peculiar pigment to be seen; teeth greatly worn.

2. Puñchi Baṇḍá: Mouth large, 55 mm.; lips full, underlip strong, livid bluish colour, but little pigment in the mucous membrane; teeth large, particularly the upper incision, much worn.

3. Girigóris Appu: Mouth 51 mm.; lips full, quite blue; pigment in the gums; teeth (above) large, shining, much worn.

4. Lúsa Nóna: Mouth 44 mm.; lips full, but short, red, no pigment in the mucous membrane; teeth, large, straight, brilliant, like mother-of-pearl, worn, with a hollow in the right middle incisor in the enamel.

5. Jimmy: Mouth 34 mm.; lips thick, but only the underlip prominent.

6. Andre Appu: Mouth small, 44 mm.; lips full, somewhat bluish, but not pigmented; upper lip short, not prognathous; teeth large, brilliant, like mother-of-pearl, with several hollows in the enamel; chin delicate, round, and prominent.

#### Indians:—

1. Murugappa: Mouth large, 61 mm.; lips full, especially the underlip, which from a full supply of blood and pigment has a dark bluish-brown appearance; on the gums a brownish stripe parallel to the edge, but still separated from it.

2. Pichchai: Mouth shorter, 52 mm.; lips full, upper short, underlip advancing, blue; the gums pigmented; teeth large, much worn.

The face index was in all chamæprosop (broad face), with the exception of Girigóris Appu, who gave a leptoprosop (long and narrow face) measure, 91·3. His long face had, as Herr Becker has remarked, a semitic touch. Andre Appu's face appeared longish: still, this was more due to the fact that it contracted very much below. The faces of the women were short, broad, and more rounded, with somewhat prominent cheek-bones. The noses also differed from descriptions

hitherto given. The oldest descriptions by the Chinese (*cp.* Vedd. Book, page 61), ascribed to the Ceylonese a "bird's beak," yet many forms appeared to us amongst these people, as the index numbers will show. Girigóris' nose was the most prominent. His nose index amounted to 68·6. The two Kandyans followed with 71·1 and 71·6, then Igga Nóna with 76·1; on the contrary, Lúsa Nóna 83·7, her brother Andre 88·8, and the little Jimmy 90·9. This last group also includes the two Indians, with 80·0 and 83·3.

The French Commission obtained similar results: three men and two women had an index over 83. Three men and three women under 74 (among these one 64·4, one 66·6, one 68·5, one 68·7, and one 69·2).

I add here a short description of their noses:—

1. Girigóris Appu: Nose strongly projecting, ridge curved, point prominent (snub?), alae small and narrow; a decided semitic expression.

2. Ukku Baṇḍá: Nose strongly projecting, straightest of all, sunk at the root, ridge slightly curved, point thick, alae not large.

Puñchi Baṇḍá: A nose strongly inclined to but not quite an "eagle nose," somewhat curved, point prominent, looking downwards, alae moderately wide apart.

4. Lúsa Nóna: Nasal ridge curved, short, point thick, overhanging; alae wide apart, somewhat flat; nostrils large.

5. Jimmy: Nose short, bent, point thick, projecting; septum short; alae very broad and full.

6. Andre Appu: Upper portion of nose thin and small, somewhat curved, point projecting, alae wide apart.

Davy has given us a poetical description of a Siphalese beauty (*Vedd. Book, page 63*). The nose is described in it as a "hawk's beak." Our ladies had nothing of that, yet it seems as if such faces had not quite died out. The cabinet photograph of a Siphalese beauty, which Herr Hagenbeck has presented to me, shows such a nose, and we can only regret not having seen the original.

In the Indians I found the following : Nose on the whole straight, but small and narrow, towards lower part wider, even in the bony part ; point little developed ; septum little projecting ; alae very broad, 46 mm.

As a conclusion to this discussion of the shape of the face, I mention that the ear, as a rule, was delicate, and in many cases small. In three persons, viz., Lúsa Nóna, Andre Appu her brother, and the Kandyan Ukku Baṇḍá, I noticed that the lobule was adherent to the side of the head. This was also the case with the Indian Pichchai. The body was strongly built in all cases. The Kandy men alone attained to a good height. Puñchi Baṇḍá 1,745, Ukku Baṇḍá 1,674 ; Girigóris and Andre Appu measured only 1,576 and 1,583 mm., the women 1,425 and 1,451 mm. Travellers have given five feet four, five, six, or seven inches — 1,626 to 1,702 mm., as the average height of the men. The French Commission give only two measurements, 1,596 and 1,576 mm.

The family (Abu Nóna) appears to be, from this, unusually small. Girigóris is at the same time thin, his calves are but little developed, notwithstanding which he is a tree-climber by profession, and climbs with the greatest ease the highest tree. Andre is also thin, but nevertheless of great strength. Lúsa Nóna, although said to be only twenty-five years old, makes a pleasant impression, but is yet aged ; she has a delicate build of body. The little Jimmy, on the contrary, is a fat, chubby-cheeked boy of unwearied activity, but truly a little glutton. His shining blackish-brown body corresponds exactly with the description given by Emerson Tennent of Siphalese children : "They looked in their nakedness like living bronzes." Iyga Nóna is sixteen years old, very light, small, and fat ; her form is quite round, her bosom prominent, and her thick cheeks swell still more prominently when she laughs.

Puñchi Baṇḍá has a proud-looking figure, with full form and strong muscles. He looks older than twenty-four years, the age assigned to him. Ukku Baṇḍá is also strong and muscular.

For dynamometric measurements, I refer to the report of the Paris Commission.

The ratio between the measurements round the hip and the height of the body showed such great differences, that I thought at first on revising my notes,—I had made some mistakes. The measurements were in all cases greater than the height of the body: even the women showed differences of 67 and 57 mm. Among the men the difference is more striking: Girigóris Appu had 82, Andre Appu 123, Puñchi Baṇḍá 60, Ukku Baṇḍá 118 mm. of a difference. The differences in the lengths of the arms are not less striking: Girigóris 732, Andre 761, Puñchi 806, Ukku 784 mm.

Shoulder-breadths measurements:—Girigóris 340, Andre 376, Puñchi 395, Ukku 391 mm. These are comparatively not widely diverging numbers. The circumference of the chest was considerable, greatest in the case of Ukku Baṇḍá, viz., 925 mm. The women have, on account of the full development of the breasts, a larger circumference than the men; the lengths of the lower extremities vary also. The height of the trochanter in Puñchi Baṇḍá amounted to 934 mm.—that was the largest number: the smallest was Andre Appu, 840 mm.; but the ratio is everywhere the same in men and women, *i. e.*, the height of the trochanter is to the height of the body as 1 to 1·8.

The shape of the hands and feet was uncommonly elegant, especially that of the feet. The Kandy men wore leather shoes, and although these were comparatively loose, still the small toes were pushed somewhat inwards, and this was even noticeable also in the next toe. Girigóris wore sandals, and had a wide divergence between the great and the second toe. Nevertheless, his feet also appeared comparatively natural. In the rest the shape of the foot was free from artificial deformities. I do not remember ever having seen such naturally shaped feet. As is well known, the feet among nations wearing shoes or boots are exposed from the earliest years to so much pressure, that a naturally-formed foot

is only seen in the case of the newly born, or in children of tender years. Even sandals when constantly worn press the toes together, and cause a permanent deformity very soon.

One seeks in vain among marble statues for a regularly formed foot. Even the gods of the Greeks have their small toes laterally compressed. Here, however, I was overjoyed to find feet with perfectly natural shapes. As their stay in Berlin was to be short, I begged Herr Hagenbeck to have a selection of casts of hands and feet made for me in Hamburg, and I am in the fortunate position to be able to lay before you good models of these. For this I have to thank Herr Hagenbeck.\*

In the first place, there is a strong contrast between the feet of the Siphalese and that of the Indians. This is partly due to the general development of the body. The ratio between the length of the foot and the height of the body is in all three the same, viz. : in the men as 1 : 6·6 ; women, 1 : 6·5. But the development of the feet is quite different. In Murugappa the whole foot is heavy, bony, and broadly developed, whilst in the Siphalese the foot is delicate, thin, and narrow. The breadth-index of Murugappa is 40·5, of Girigóris 36·8, of Lúsa Nóna 28·2. The Paris Commission found among the men indices of 39·5 to 44·3 ; among the women 36·5 to 40·6.

In all, the toes were very movable, and they were capable of diverging widely at will. On this depends the safety in climbing,—which is possessed by Girigóris to a wonderful degree,—and the capability to seize objects with their toes. As seen from the illustration,\* the divergent position in the

\* Illustrations of a few of these are annexed to the German text. The views of them are taken laterally and from above, and designed with the greatest care by Herr Eyrich, one-sixth their natural size. No. 1 is the foot of Lúsa Nóna, No. 2 that of Girigóris Appu, and No. 3 that of Murugappa, one of the Indians. The cast of the foot of Iga Nóna is not given, nor the casts of the hands of any of the troupe.

case of Murugappa is well shown ; in the case of the Sinhalese to a much smaller degree. In all cases, however, is seen the great interval between the great toe and the others, especially in Murugappa. The three middle toes form a group by themselves.

At the same time, one may notice the length of the toes of this middle group, especially of the second. The Sinhalese have these toes almost in the shape of fingers, straight and long. Murugappa, who also has short and thick fingers, shows also short toes, thick and plump ; and the great toe is so widely divergent as to project but little over the second. Among the women, the second toe projects beyond the first, notably in Iyga Nóna, whilst in Girigóris the corresponding toe is shorter. This is strongly developed in Andre Appu. The terminal phalanx of the great toe is very broad in all cases ; the smaller toe is very short. The middle of the foot is small, thin, and straight. It widens gradually up to the heads of the metatarsal bones, where it, in comparison with a foot accustomed to shoes, appears strikingly broad. Notwithstanding this the great toe has no proper ball ; externally the little head of the fifth metatarsal bone is somewhat prominent. Further back the external border runs uniformly, whilst in the inner border rises quickly, forming a well-marked arch. The heel is strong and firmly set. The span of the foot is high and delicately arched, especially behind the first metatarsal bone. The tarsal bones are strong, little prominent, and very high. In Murugappa the height above the ground is 59, in Lúsa 46, in Girigóris 48, in Iyga 54, and in the two Kandians 61 and 65 mm., respectively.

With this I finish the analysis to which this interesting company has given rise. Without as yet classifying the subjects of my discourse, I dare to hope that the communication as it stands will be a sufficient excuse that I do not come to any definite conclusion. How many of the differences observed are merely due to the individual, how many are due to race-difference, I cannot satisfactorily say. Take an

example: according to my earlier craniological examinations, the Siphalese are dolichocephalic. Now, among the people actually measured by me here, I find only one dolichocephalic, viz., Girigóris Appu, the same whom Herr Becker took for an Arab. In reality his face, particularly his nose, had a distinct semitic look. But the Moormen are now-a-days Muhammadans, and if in rare cases they mix with the Siphalese (see my *Veddá Book*, page 94), it does not follow that they also change their religion.

Besides, the Jewish face appears among so many of the inhabitants of the islands of the East, that I would not support such a supposition on that ground. Also the deduction drawn by Herr Becker from the name *Abu* is so uncertain, as I have already shown, that it proves nothing. If Girigóris is not an Arab, he must be considered as a typical Siphalese. If this is accepted, then the others measured by me are not typical: even the stately Kúruwe from Kandy, and least of all the woman Nóna. Their short and broad skulls, their chamæprosopia (broad faces), and in particular their broad-pressed-in-curved noses, with the alae wide apart, point with a strong probability to a mixture with the Tamils.

The little Jimmy resembled his father so little, that one felt almost inclined to disbelieve the relationship. He was, however, the very image of his mother. His roundish-square head, his full-moon face, his ape-nose were only exaggerations of the mother-type. But the colour of the skin was quite dark, whilst the mother's was light. Who can doubt but that here individual and sex peculiarities were recognisable? but where is the line of demarcation of ethnical peculiarities? Unfortunately there is still wanting an exact description not only of the Ceylonese Tamils, but also of the Indian Tamils. I have therefore earnestly requested Herr Hagenbeck, in case he should again bring such people to Europe, which is not at all unlikely, to bring well-authenticated Tamils. One thing seems to me certain. If the French ethnologists entertain the opinion that the dark-skinned races of India

originated from Negritos, it is most probably a mistake. The Negritos known to us have that woolly hair which consists of small, close, spiral rolls, quite similar to the Blacks of Africa, and not only to the Niger proper, but, as lately discussed, also to the Caffirs and the other Bantu nations. In the case of the Africans, each spiral roll is so hard that it feels like a solid body. In the case of the Negritos the rolls are somewhat soft, from the fineness of each individual hair. Our Ceylonese show the very opposite of this. They are in the plainest meaning of the term smooth-haired, without the shade of a curl; the beautiful appearance of their long black hair is certainly improved by the care they bestow upon it, but no Negrito is capable, so far as we know, by any amount of care to change his hair in a similar manner.

Even the Dravidian Indians have nothing of the Negrito hair. One must therefore look to other sources than this, and it is possible that they are a very mixed race. As far as language is concerned, the Siphalese must be referred to an Aryan origin. Their history favours this idea; but are, on this account, Mongolian and Malayan connections to be excluded? I cannot believe it; at all events, I can say that many among the people presented to me, especially among the women, seem to point to Eastern relationships, and that if these people are really Siphalese, without any fresh mixture of blood, then must the Siphalese race be looked upon as a mixed race in the highest degree.

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Siphaliese and Indian.	Siphaliese.						Indians.		
	Girigóris Appu. ♂ 29 J.	Lósa Nóna. ♀ 25 J.	Jimmy (Sinni). ♂ 3 J.	Andre Appu. ♂ 21 J.	Ippa Nóna. ♀ 16 J.	Puthi Bapó. ♂ 24 J.	Ukku Bapó. ♂ 22 J.	Muru- gappa. ♂ 32 J.	Pichchai. ♂ 19 J.
...	188	168	167	182	178	189	186	196	183
Greatest length	136	139	133	152	135	150	145	147	147
Greatest breadth	114	122	110?	123	114	128	125	128	127
Height of ear	98	106	88	104	100	109	101	104	107
Breadth of forehead	138	162	130	169	162	181	186	193	163
Height of face, A	116	103	81	114	104	111	111	119	106,5
Height of face, B	71	63	40	69	62	70	70	73	66
Height of face, C	127	129	110	134	125	137	132	144,5	134
Breadth, <i>a</i> jugal	87	75	59	87	86	87	94	95	89
Breadth, <i>b</i> malar	101	97,5	86	100	90	104	93	106	102
Breadth, <i>c</i> mandibular	35	31	28	35	31	35	34	37	39
Interorbital, <i>a</i>	90	91	78	92	91	99	96	107	94
Interorbital, <i>b</i>	51	43	33	45	42	53	52	50	48
Nose, height of	51	41	27	39	35	45	48	46	41
Nose, length	35 (36)	36 (38)	30	40 (44)	32 (34)	38 (39)	37 (39)	40	40 (41)
Nose, breadth	51	44	34	49	45	55	50	61	52
Mouth, length	56	50	46	52	59	60	59	69	55
Ear, height	...	...	...	...	...	...	...	...	...

I.—HEAD MEASUREMENTS.

Siphaliese and Indian.	Siphaliese.				Indians.				
	Girigóris Appu. ♂ 29 J.	Lúsa Nóna. ♀ 25 J.	Jimmy (Sinni). ♂ 3 J.	Andre Appu. ♂ 21 J.	Ippa Nóna. ♀ 16 J.	Puñchi Bandá. ♂ 24 J.	Uku Bandá. ♂ 22 J.	Muru-gappa. ♂ 33 J.	Pichchal. ♂ 19 J.
Body, height	1576	1425	769	1583	1451	1745	1674	1657	1613
Hip	1658	1492	—	1706	1508	1805(?)	1792	1815	1723
Breast, circumference...	800	825	—	830	855	900	925	900	790
Shoulder, breadth	340	322	—	376	330	395	391	388	349
Shoulder, height	1314	1199	—	1330	1214	1482	1404	1375	1334
Elbow, height	1008	912	—	1022	948	1142	1083	1042	1024
Wrist, height	743	670	—	744	730	866	810	753	752
Middle finger, height...	582	520	—	569	572	676	620	588	594
Nasal, height	971	—	—	990	—	—	—	970	981
Trochanter, height	863	758	—	840	789	934	901	887	878
Knee, height	463	412	—	481	450	540	534	488	500
Malleolus ext., height...	48	46	—	49	54	65	61	95	61
Hand, length	170	155	100	190	160	182	188	179	175
Hand, breadth	75(100)	70(86)	50	81(94)	75(95)	94(100)	89(102)	59	85(95)
Foot, length	286	216	136	280	224	260	276	249	240
Foot, breadth	87	81	60	97	86	102	100	101	91
Langenbreitenindex	72,3	82,7	79,6	83,5	75,8	79,4	78,0	75,0	80,3
Ohrhoehenindex	60,6	72,6	65,9?	67,6	64,0	67,7	67,2	65,3	69,4
Gesichtsindex	91,3	79,8	73,6	85,0	83,2	81,0	84,0	82,3	79,4
Nasenindex	68,6	83,7	90,9	88,8	76,1	71,6	71,1	80,0	83,3

## II.—BODY MEASUREMENTS.

## III.—BERECHNETE INDICES.

OUTLINE OF TWO YEARS' SCIENTIFIC  
RESEARCHES IN CEYLON.

BY DRs. C. F. AND P. B. SARASIN.\*

*(Read February 16, 1886.)*

IN the short space of a report it will naturally not be possible to enter into any details: we can simply give a few results which seem to us to be of interest. Further, we must omit to refer to and compare notes with works already published on the different objects we speak of: this we reserve for our future publications in Europe, of which copies will be sent to the Society.

## I.—ANTHROPOLOGICAL.

We begin with some anthropological notes, and shall later on refer to our chief branch of study, zoology.

We did not intend, when we came to Ceylon, to make anthropological investigations; but as the races in this Island proved of the highest interest, we could not but spend a part of our time in examining them. During our journeys, in which we traversed the Island in nine directions, we acquired a great deal of information on this subject.

As is very well known, Ceylon contains three principal races, the Sinhalese, the Tamils, and the Veddás. There are others, whom we may dismiss with a brief remark; for instance, the Moors, more or less casual inhabitants, Arabian

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\* In offering this Paper to the Ceylon Branch of the Royal Asiatic Society, we wish to express our best thanks for the kindness shown to us by this Society in presenting us with an almost complete series of the Society's Journals. Besides, we owe a debt of gratitude to many individual Members for the ready assistance they have been good enough to give us in our exertions, and to which we think we cannot reply in a more appropriate way than by laying before you a preliminary report of our researches.

merchants, who settle in every trading place of the East. In a very few parts only the Moors have their own villages, chiefly so in the Batticaloa district, where they form about one third of the inhabitants. The Afghans, Malays, Kaffirs, Parsees, &c., are of no importance for our purposes.

The two races, Sighalese and Tamils, are not living side by side in the same districts, as is often believed; such is only the case in the large towns and upon the hills, whither the Tamils are imported as coolies by the planters. Generally speaking, the Sighalese inhabit the hilly zone and the fertile and wet Western and Southern Provinces; they attain their greatest density, according to the census of 1881, in the district of Colombo; they are very scarce in lower Uva, in the North-Central Province, and in the northern parts of the Kurunégala district.

The Tamils, on the other hand, with the exception of those in the planting districts, live on the eastern coast of the Island. They are numerous in the Batticaloa district, less so in the district of Trincomalee, almost wanting on the coast north of Trincomalee. The real centre of the Tamils, however, is the densely populated Island of Jaffna, where they live to the exclusion of every other race: even the ubiquitous Moor is very seldom met with. Mannár and Puttalam, further on, are Tamil places, and south of Negombo there is an old Tamil colony, which has existed since the time of King Gaja Bahu I. (113 A.D.).

It would be erroneous to suppose that the districts of Sighalese and Tamils are adjoining each other: this is only the case in very few places, as, for instance, north of Chilaw. Otherwise, a broad belt of forest land separates the Sighalese countries from the Tamil ones. This belt, which is almost uninhabited, and in many parts completely so, begins to the east of Saffragam (Sabaragamuwa), maintains a breadth of 20-30 miles adjoining lower Uva, and expands to about forty miles in Tamankaðuwa. This separating belt increases to a breadth of about sixty miles in the northern parts of the

Island : almost the whole Northern Province is without any cultivation, and therefore the Tamil Island of Jaffna is separated by an enormous rampart of forest from the Sinhalese districts, even more so than the Tamil coast of Batticaloa.

We learn in the histories of Ceylon, and observe it at the present time, that Sinhalese and Tamils intermarry sometimes. We know, even, that many kings of Ceylon have been of Tamil blood ; but notwithstanding this, a certain mutual aversion of the two races is not to be overlooked, and it is just that aversion which proves that a deep difference of race is existent. We learnt, for instance, in Trincomalee, that no Sinhalese will die in that Tamil place, but as soon as one gets ill he returns to his native country ; and other facts still further illustrating this aversion could be mentioned.

The enormous belt of forest just mentioned, and the open park country the solitude of which is only interrupted by relatively few small villages, and very seldom by large patches of cultivated land, such as near the lake of Kantalay and round other smaller tanks, is the abode of the Veddás. They live in the eastern part of Ceylon, and are the remnants of a tribe which deserves our attention in a very high degree.

We arrived too late for the exploration of this tribe. The original wild Veddás are extinct,—at least, beyond some quite incredible rumours, we could not find any traces of them during the three months which we spent in searching for them in the remotest parts of the Island. All the Veddás have been induced to leave the rock-caves, their old natural dwellings, and to settle in small villages under the charge of the headmen of the adjoining districts. The purest Veddás we found are living in the Nilgala district, and near Bintenna ; others near Mahá-oya, in the Eastern Province, and in the Friars-hood range. But even these are already so accustomed to Europeans by their frequent visits to Kandy and Badulla, and by the hunters who have been to see them, that the Nilgala Veddás, for instance, as soon as

they saw us coming, began to dance and to sing, and tried to tell us incredible stories. The settlement of the Veddás in villages gives naturally much occasion for mixing with other elements; many Sinhalese villagers marry Veddá wives, and therefore, all the intermediate types between Veddás and Sinhalese are to be met with. In many villages of lower Uva, where Veddás are already completely extinct, the traces of old Veddá blood are easily noticed in the features and in the dark colour of many a Sinhalese villager.

Similar intermarriages, or those which happen in the Sinhalese districts, are taking place on an even larger scale in the Tamil countries. On the east coast, north of Batticaloa, there are many villages, and Veddás have been induced to settle; and in these places the mixture of Tamils with Veddás is conspicuous. In this way the Veddás will disappear completely at a not very distant time; already, according to the census of 1881, there are not more than 2,228 individuals who still call themselves Veddás. The race is not dying out, as is generally believed, but is being absorbed by intermarriage with the surrounding tribes.

Our chief object was to ascertain whether the three races of Ceylon are really so different from each other that they could be distinguished by anatomical characters, or whether the differences between them were so insignificant that no positive result could be obtained by a careful comparison. A great obstacle to our purpose was necessarily the frequent intermarriages of the three tribes, which often left us in doubt whether the men we examined were of pure blood or not. The only way to obtain a satisfactory result was therefore to collect as large a number of skulls as possible, and to take measurements of numerous specimens of each race to compile averages. Thus we collected nineteen skulls of Veddás, fifteen of Sinhalese, and fifteen of Tamils. We dug them all up ourselves,—with the exception of some Sinhalese skulls,—and thus are sure that no confusion has arisen. We found no time during our stay in Ceylon to

examine these skulls,—we shall do so in Europe,—and therefore are now able to speak only of the results which we obtained by measurements of living individuals. Many of these measurements will have to be compared with those of skulls where alone measurements can be taken with mathematical exactness.

To begin with the height, we found the Veddás to be the shortest of the three races. Veddás of Maha-oya had an average height of 1,541 mm., eight from Nilgala 1,575, thirteen coast Veddás north of Batticaloa 1,591 mm. After these, range twenty-two Siphalese with 1,624 mm., and finally, as the tallest, the Tamils, of whom twenty-five have been measured with 1,652 mm. of height on the average. The size of the head does not at all correspond with the height, as the largest head does not belong to the Tamils, but to the Siphalese; and this fact is in accordance with the higher intellect of the latter. In size of head the Tamils range after the Siphalese, then the coast Veddás, and by far the smallest heads are those of the Veddás in the interior. The coast Veddás contain, as already mentioned, many Tamil elements, and therefore in a number of measurements range between the Tamils and the other Veddás.

It may be interesting to point out in which measurements the principal differences are found. Firstly, the height of the face, that is the distance from the notch of the nose to the chin, is with the Veddá the smallest (105 mm.) on the average; it is larger in the Tamil head (111 mm.), and largest in the Siphalese (115 mm.), and this difference gives to the whole face a different appearance.

Secondly, we have the diameter of the back part of the skull, or the distance between the two mastoid bones, in the Veddá only 124 mm., in the Tamil 130, and in the Siphalese 132. The head of the Veddá is therefore in its back part narrower than the head of the two other races, and especially of the Siphalese, and we have strong reasons to suppose that the brain of the Veddá is likewise much

smaller than that of the Tamils, and still more so than that of the Sighalese.

Thirdly, the lower jaws of the Vēddás are much narrower than those of their neighbours. A fourth difference is found in the size of the eyes, as the Vēddás have the largest and the Sighalese the smallest eyes of the three, the Tamils ranging here also between the two others. The differences in this last measurement are naturally very small, but still noticeable.

One of the most striking features in the face of the Vēddá is the shape of the nose; firstly, it is very broad, 40 mm., while with the Sighalese it is only 39 mm., and with the Tamil 38 mm.; secondly, the bridge of the nose between the eyes with the Vēddá is in most cases very low, sometimes almost flat. This fact gives to the Vēddá nose a strange shape, and strikingly influences the features: the bridge is higher with the two other races. The Sighalese have often very well-formed eagle-shaped noses.

Besides these peculiarities of the Vēddás already mentioned, shortness of face, narrowness of the back part of the skull and the lower jaw, largeness of the eyes, and lowness of the bridge of the nose, we could mention more differences in the measurements of the head; but it would lead us too far for the present, and we think it sufficient to show that such peculiarities do exist, and are to be traced by measurement. The results which we shall obtain by comparison of the skulls, we shall be glad to lay before this Society after our return to Europe. Taking exact measurements of the limbs is still much more difficult than measuring the head, and of the results obtained we venture only to specify now the following one as fairly well established. The lower arm of the Vēddá and also of the Tamil is relatively a little longer than that of the Sighalese.

The colour of the Vēddás is always a dark and dirty chocolate brown, a colour which is likewise frequently found with Tamils, but seldom amongst Sighalese.



Summing up, we learn by the measurements that the Siphalese, Tamils, and Vēddás are three well-distinguishable races, and further, the measurements give much reason to suggest that the Tamils are more closely allied to the Vēddás than the Siphalese, which latter no doubt represent the highest race, whilst the Tamils in many respects range between the two others.

One result in any case is certain, viz., that the Vēddás are by far the lowest in the scale of the three races, not only in their habits, but also in their anatomy, and this fact confirms the opinion of those who claim the Vēddás as the remnants of an old tribe of Aborigines. We can pass over the customs and the religion of the Vēddás, because former writers have dealt with them, and the principal facts are generally known. We will call attention to one point only, because it illustrates clearly the primitive customs of this race, and that is the wearing of leaves as a cloth. A string is tied round the loins, and small branches are put underneath, till a thick belt of leaves is formed. This custom is now almost extinct by increasing civilisation, but almost every Vēddá, if requested to do so, will appear in a few minutes in his dress of leaves.

It is our intention at a later period to deal more exhaustively with the anthropology of Ceylon, and to illustrate our writings by maps and photographs. We therefore confine ourselves in the meantime to these preliminary notes.

## II.—ZOOLOGICAL.

As zoologists, our labours in Ceylon were naturally devoted to the study of animals. Before we came to this Island we had set ourselves the special task to discover the development, then entirely unknown, of *Epicrium glutinosum* — *Coecilia glutinosa* (Linn.). This is a kind of ground snake, living in the tropics of the East, and known long since; the shape of the animal is like that of an eel, one to one and a half feet in length, dark brown in colour,

with two yellow side-bands. The skin is lubric, like that of a frog or a salamander. It lives under the surface soil near rivulets or ponds, in cavities which it digs for itself. Its eyes are small; there are no feet. Two tentacles, which are at the top of the snout and are retractile, are very remarkable; further, the skin is particularly interesting, because there are imbedded in it numberless very small round scales like those of fish, but invisible from the outside, and also different from the fish scales in their finer histological composition. The genus *Epicrion* has some few relatives in America, which bear the old name of the whole class, viz., *Coecilia*.

It is but natural that this animal should excite the greatest interest of naturalists, and that many efforts have been made to arrive at a clear knowledge of its position in the natural system. The conclusion arrived at was, that it ought to be ranged under the order of the *Amphibians*, and not, as it was supposed formerly, under that of the *Reptiles*, especially of the snakes. Later on, as there have been found different anatomical peculiarities which pointed out a somewhat isolated position of the animal, it was raised to a special order, that of the *Assoda*, and was put in the lowest rank of the general class of the *Amphibians*.

We know from experience, that if the position of an animal in the natural system is not clearly understood, its development throws light upon the question, the animal in its development showing the traces of those forms which it had to run through, according to the theory of evolution, to arrive at its present form. We know, for instance, that the well-known water-salamander (*Triton*) is an animal which for some time of the year lives on land, and breathes through lungs; it lays its eggs in the water, and out of them come forth larvæ, which have at each side of the head near the ear a bundle of gills. Feeding in the water the animal gradually obtains lungs, the gills atrophying, and finally dropping off; it then seeks land, and

breathes air. Now, the question is this: Does *Epicrium* show the same mode of development as the water-salamander, or not?

It was known that the order *Epicrium* has been found living in the water, and at each side of the head, where gills were expected to be, they had little openings. But this was all that was known about the development of *Epicrium*. Here began our work. It was evident that we had two suppositions: Either, *Epicrium* lays its eggs in the water, and there the young ones take their development (as is the case with the salamander), or *Epicrium* is viviparous. So we carefully examined all ponds and rivers in the vicinity of which we found the full-grown animals, but though we often met with young specimens living in water, with a gill-hole at each side of the head, yet we never found gills, but always well-formed lungs; earlier stages did not come to our notice. So we began to dissect the full-grown animals, and to examine them for embryos; we opened about a thousand females, yet we never obtained the result so much wished for. At last a cooly brought a little lump of eggs, which he had found in the ground near a rivulet, and from this moment the mode of development was discovered, which generally proceeds in the following manner:—The pregnant female forms in the soft damp soil at first a small globular cavity, and deposits there a lump of about thirty pretty large eggs, connected with each other by a sort of string. The mother curls herself round the eggs, and broods probably in order to keep them damp with her body in the case of sudden drought. The eggs are of the size of a very large pea, and yellow, bearing a close resemblance to those of reptiles, the lizard for instance; in size, therefore, they cannot be compared to the eggs of a frog. In such an egg an embryo develops, which is especially interesting owing to the circumstance that behind the eyes, on the same spot where the salamander has them, three long gills are growing, of which one is directed forward, one upward, and one

backward. The gills have the shape of ostrich feathers, and as they are red like blood, the embryo, after being artificially freed from the egg, looks really pretty. Its colour is black, but the yellow yolk adheres to the belly. This shows that the *Epicrium* whilst in the egg passes through the same stages which the salamander passes through in the water. In the salamander, the reason for gills is clear: they serve the young animal to breathe in the water like fish; in *Epicrium*, the gills are as well formed as in the salamander, but as they are not required to act as breathing organs under water, their existence is not so easily understood; yet they are perhaps of some importance as organs of breathing of the embryo in the egg. The embryo remains in the egg for a very long time, until it reaches the size of about six to seven centimetres; it also moves rapidly if at that time it is artificially freed and put into water. The next thing we observed was the young *Epicrium* living in water with two gill-holes, but without gills; the size of the youngest was only a little larger than the full-grown embryos. It is therefore certain that the embryos break the shell of the egg, strip off their gills when wandering through the soil to the water, and live for some time in water with simple gill-holes and lungs, which had developed already in the embryonic stage. A young *Epicrium*, or so-called larva, when living in water comes from time to time to the surface to inhale air. By and by the gill-holes close, the young animal appears on land, and no more leaves it; when put back into the water it is soon drowned.

It now would no longer be correct to assign to the *Epicrium* the lowest position in the natural system amongst *Amphibians*. The *Epicrium* has generally the same development as the salamander, and has therefore its position quite near the latter. The salamander belongs to the *Amphibians* with a tail, in contrast with the frog, which is a tailless *Amphibian*. The *Epicrium* was considered to be without a tail; in the full-grown specimen, however, a trace

of a tail is discernible, and the embryos show clearly a short tail with a well marked fin. These are the main features of the development of *Epicrium*. There are many other points of interest, but they come more into the scope of a specialist, and could not be explained in a short paper and without the aid of drawings, and they will have to be dealt with accordingly at a later period.

The chief results are briefly—

- (1) *Epicrium* (like *Coecilia*), on the basis of its anatomy, cannot be placed in any known group of Amphibians.
- (2) Its embryonic evolution passes through the same stages as the salamander as a larva.
- (3) In consequence, *Epicrium*, notwithstanding its very different appearance, has to be classed as the nearest neighbour of the salamander.

The researches just referred to occupied us about eight months at Péradeniya. We then proceeded to Nuwara Eliya to begin studying the *rain-worms of Ceylon*, both from a histological and a systematic point of view. The hills of Ceylon are of special interest in possessing quite a gigantic species of rain-worm, which attains a length of about four feet, and a thickness of a big thumb. We hoped to find other similar species, but we met only with smaller kinds that were new, amongst which were a beautiful blue-ringed one of rather large size, and many smaller ones of less striking appearance. Ceylon being an island long since separated from the continent, those animals living in the soil, as they are, must be of a peculiar interest, and an exact systematic examination of the rain-worms of Ceylon might induce an investigation of those of India. The comparison of the forms in both countries promises valuable results as to the range of geographical distribution ; it might also furnish a further basis for speculation about the changes of the continents and islands in the course of time. Now, it is true that the rain-worm is very easily transferred in many ways ;

we know already, that upon the different elevations of the hilly zone of Ceylon, different forms are found which are not to be met with in the low country, and which represent probably similar endemic forms, as for instance amongst the lizards in *Ceratophora* or *Cophotis*. It is not the place here to enter into our anatomical and histological examinations of these animals, as they are of too special a scientific interest; but we may mention that a considerable portion of our labour was directed towards the examination of the vascular system of the rain-worm, which we tried to investigate physiologically.

A result of more general importance, which we obtained by histologically examining the skin of *Epicrium* in Péra-deñiya, and that of the rain-worm in Nuwara Eliya, is the following :—

The body of every animal, with the exception of the lowest order, as the animalculæ, &c., is surrounded by a more or less thin layer, the so-called epidermis: it is not homogeneous, as glass for instance, but composed of innumerable very small corpuscles, the so-called cells, which are arranged like paving stones. Just under this epidermis the finest branches of the blood vessels are spread like a net. The same is the case in the lungs, and as here the blood comes to a very near contact with the air, it absorbs oxygen and returns carbonic acid; that is the process we call breathing. As the blood is separated from the outer air by the above-mentioned fine skin, the epidermis, the receiving of oxygen and returning of carbonic acid was explained as possible by the physical law of diosmose. But further it was observed that the different cells of the epidermis do not adjoin each other, but that between them a number of cavities exist, and the cells themselves are connected with each other by exceedingly fine communicating filaments. The outer layer of the body was found therefore to be not solid. In the *Epicrium* we observed that from the finest vessels just underneath the epidermis, little tubes ascended outwards, which

after having reached the epidermis, divided into tiny arms like those of a chandelier, and these arms again were connected with the range of cavities between the cells of the epidermis. These cavities communicate with the surrounding medium ; so we learned that the fluid of the vascular system communicates by means of the very fine tubes, and the cavities of the epidermis just described with the outside. The tubes are so small that even a blood-corpuscle is much too large to pass through ; and further the blood-fluid, the so-called serum itself, cannot flow out of the skin, according to the law of capillarity. We pursued the subject further, and found a similar state in the gills of fishes, the skin of snails, leeches, and rain-worms. This discovery of a direct communication of the vascular fluid with the outer medium, obviates the use of the law of diosmose, and the process of breathing becomes more intelligible. It is to be hoped that injection into the vascular system may lead to a conclusive proof of our theory.

The next five months were devoted to travelling in the south-east of the Island, partly in search of information about Veddás, partly with the object to obtain an embryo of an elephant. His Excellency the Governor had the kindness to give us free permission to shoot elephants, with the special right also to kill females for the aforesaid purpose. But unfortunately our exertions in this latter direction were not successful. Three female elephants were killed, but none had an embryo. Part of the intestines of the animals has been preserved for future histological examination.

During our stay in Ceylon, we used to collect whatever seemed to be important, and thus a fair amount of scientific material has been accumulated, which will be dealt with in Europe after our return. Many new specimens which we were able to secure in the course of our stay we pass over here, because they have not yet been exhaustively examined. However, we shall briefly touch upon the chief results of our four months' stay at Trincomalee.

We discovered there two snails living as parasites on a sea-star. Until now only very few parasitic snails have been found. The most famous kind is *Entocontra mirabilis*, which lives in a holothuria, and is an animal that in appearance is only with difficulty to be distinguished from an intestinal worm; but its eggs develop fully-formed young snails with shell, feet, and eyes. This is a new example to show how impossible it is in many cases to understand the systematic position of an animal without the knowledge of its development. The snails examined by us are not so extraordinarily deformed as the *Entocontra*, yet they have many characteristics. Our two snails are quite different from each other: they are also living on different parts of the sea-star. The one which inhabits the interior of it is about a quarter of an inch long, and has a well-formed somewhat hard shell. Where it dwells, the body of the sea-star is inflated to a spherical cavity, and when the apex of the shell touches the skin of the sea-star, a little hole is formed, which through the interior of the cavity is in communication with the outside. The snail can hardly move, and thus lives like a captive in his cell. The most remarkable feature is, that the mouth of this snail, which is small in other species, is extended into an enormous proboscis, almost twice the length of its body. This proboscis is immovably connected with the inner side of the body-cavity of the sea-star, and through it the snail sucks the fluid of the sea-star as its nourishment. Underneath the shell the snail has a gill, and for breathing it requires sea-water; this streams through the above-mentioned hole into the cell of the snail. The water for breathing has constantly to be renewed, and to render this possible, the following apparatus serves: At the root of the long proboscis rises a bell-shaped muscular fold, which rests with its inner side against the shell of the snail, with the outer side against the wall of the cavity, and which is so large that it covers the shell completely. We have not



watched the function of this muscular bell, but we believe that it very likely works as a pump for constantly renewing the water in the cavity. This snail is most probably to be ranked in the system near the genus *Hylina*.

The other snail lives not inside the sea-star, but upon its skin; its shell has the shape of a Phrygian. It is like the other, immovably connected with the sea-star, the base of its proboscis being enlarged to a disc, and this being connected with the skin of the sea-star by numberless little folds. It lives like the other on the body-fluid of the sea-star.

The sea-urchins are characterised by a globular hard shell, which is covered all over with spines. The regular sea-urchin has the mouth at the lower pole of the spherical shell, at the upper one the arms. Wyville Thomson was the first to discover a sea-urchin the shell of which was not hard but flexible like leather; the spines were quite short, only about a quarter to half an inch in length, and surrounded by a thick skin: thus they looked like little clubs. In later years a good number of other specimens have been brought up from the deep sea during the expedition of the "Challenger." In Trincomalee we were lucky enough to discover in a depth of four to six fathoms in the harbour, a beautiful new species of this group. The greatest diameter of the animal was about six inches; its height not quite two inches. The colour was a dark brownish black, and this ground was covered with small spines resembling clubs, in consequence of the skin around them. Besides, small azure corpuscles on stalks ran in radial lines from the upper to the lower pole, and adorned the sea-urchin like jewels. These corpuscles, as well as the other larger spines, have a most striking peculiarity. If the animal is taken into the hand you feel a pain as of about a dozen bee-stings, which lasts for some three or four minutes, then it ceases completely. The small spines as well as the blue corpuscles turn against everything that approaches, and from a more precise examination, the result we came to

was, that, as is known to be the case with insects, every spine is provided with a peculiar bag of poison, the spine itself being hollow, and the poison flowing out of the bag through it into the wound; the blue corpuscles especially have round the bag of poison a fairly thick ball of muscular substance, and this contracts if the fine spine inside of the corpuscle penetrates into the skin. We have no doubt that a similar apparatus also exists in the other leather-urchins, but it has not yet been determined. It is evident that this soft sea-urchin would soon be destroyed by fishes of prey if it had not the formidable arms just described. This circumstance a small fish availed itself of; this little animal, which is in length about one inch, lived just between the spines of the sea-urchin, so that a pursuing fish could not come near it at all without being wounded by the spines of the sea-urchin; moreover, the little fish had the same dark brown colour as the sea-urchin, and was thus doubly protected.

Until now in no sea-urchin had a real eye been found. It was noticed that many had a very feeble perception of light; but it was impossible to state that they could really see. This is quite correct of the great majority of the sea-urchins; but in the genus *Diadema*, which is very common throughout the tropics, we found most curiously composed eyes, somewhat similar to those of insects. As light blue spots they run round the surface of the black sea-urchin, like the above described blue corpuscles of the leather-urchin. Each of these blue spots consists of many hundred small crystal cones, which rest upon a layer of nervous substance. Microscopical examination had already shown that the blue spots were eyes, and the simplest physiological experiment confirmed it. If the hand is brought near the aquarium which contains the sea-urchin, without touching the water of course, the urchin at once directs all its long spines against it to protect itself; it sees therefore very well. Between the spines of *Diadema* a little fish lives, which

is protected in this case by the length of the spines, while the above-mentioned one found protection in the poison-apparatus of its host.

During the last days of our residence in Trincomalee, a sea-urchin was brought to us, which both by its size and by the splendour of its colours quite surprised us. It was a foot in diameter exclusive of the spines, which were two to three inches long. Its height was about six inches; on the ventral surface were shorter and stronger spines than above. Its colour was brownish black, and over it ran from the apex downwards broad Saturn-red bands, which in the whole of their length were dotted with very large splendid azure spots; these spots we discovered to be eyes, as in the case of *Diadema*. This gigantic sea-urchin has up to the present no rival, as far as we can learn from the literature on the subject. Probably it was brought up from a great depth to the shore by the strong current of the north-east monsoon. Should it prove, after a more exact systematical examination, to be a new species of the genus *Diadema*, we would propose to give it the name of *Diadema imperator*.

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A BRIEF SKETCH OF THE MEDICAL HISTORY  
OF CEYLON.

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*(Read Nov. 18, 1886.)*

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INTRODUCTION.

AS I am to deal with a subject which is somewhat special, it is my natural desire, in expectation of meeting a mixed assembly, that my treatment of the contents of this Paper should be such as to prove interesting and instructive to non-professional as well as professional persons. To the professional part of my audience, the medical annals of this Island cannot but be replete with interest; and I trust that my other hearers will derive some useful information from an attempt to give an account of diseases which have prevailed in this country from the earliest period of which we have any record, the progress made by European medicine, and of the improvement in the sanitary condition of this Island effected during the present century.

Although the inhabitants of this beautiful Island have had a fair share of the "ills that flesh is heir to," it is satisfactory to know that the efforts which have been made by the officers of the Medical Service of this Colony, under the direction of an enlightened and beneficent Government, and by local self-governing bodies, for the improvement of the health of the people, have, through the blessing of a merciful Providence, been crowned with a great measure of success.

It is not my purpose to give you statistical details: these might add greatly to the value of the information contained in this Paper, but would detract from its interest. I shall merely give a statement of facts: and in taking a rapid glance at our past medical history, I will, in the first place,

touch on the salient points connected with the native or Buddhist system of medicine ; next, on the medical history of the Portuguese and Dutch periods, so far as learned from records at my command ; and lastly, on the great sanitary reforms effected since the British occupation of the Island.

There is a mine of rich material worthy of exploration in the archives of the Civil Medical Department, dating from its separation from the Military Service in 1858 ; but I have been able only to make use of published records and of the Administration Reports and Sessional Papers of the Legislative Council from 1864, the period at which their publication commenced.

#### SINHALESE SYSTEM OF MEDICINE.

In the early part of the third century B.C., Aśóka was the great Buddhist sovereign of India. He propagated the new doctrines of Buddha by erecting columns or pillars, on which were engraved those memorials or edicts he was desirous of making generally known. These inscriptions are remarkable monuments of the sagacity and benevolence of that great sovereign, who erected viháras, monasteries, and hospitals, thus giving effect to whatever there is of beneficence in Buddhism.

From an early period, the priests charged themselves with the duty of educating children and relieving the sick. It was in Ceylon that the Buddhist doctrines were first reduced to writing. These doctrines addressed to mankind in general, besides inculcating the duty of reverence to parents, love to neighbours, charity and other moral precepts, recommended the prosperous and wealthy to found Refuges for the blind, the destitute, the crippled, the sick and wounded both of man and beast. This was taught to be the surest method of attaining to the highest degree of perfection and holiness on earth, by means of which the future reward of the Buddhist faith might be obtained, viz., *Nirvána*, or an easy departure and utter annihilation. These motives actuate some of

the Buddhists to this day, and I have learned from reliable authority that the Buddhist contractor of the Planters' and Anthonisz Wards (Mahámarakkala Kurukulasúriyapatabēdigé Solomon Perera) has actually built these hospitals simply at the cost price of the materials, in the hope of obtaining merit here and *Nirváṇa* hereafter. King Aśóka also recognised the sanctity which attaches to human life, and directed that the life of no living being was to be taken ; and that wells were to be dug, trees planted, and *caravansaries* erected in public highways for travellers.

The medical houses, or hospitals, of that period, were to be provided with all sorts of instruments and medicines, consisting of mineral and vegetable drugs, and food ; and skilful physicians were appointed to administer them at the expense of the State. Those physicians, or *Vedarálas*, who had gained a knowledge of Sanskrit, committed to memory stanzas, and recited them by the bedside of the patient. These stanzas were from the *A'yur-Veda*, a religious treatise on the science of life and medicine.

The *A'yur-Veda* (from *áyur*, period of living, and *ved*, to know, treating of the science of life and medicine) is said to have been first preserved by oral tradition in the form of hymns, prayers, and precepts. It is regarded as the most ancient and authentic book on Oriental medicine, next to our own Bible, and consists of one hundred lectures, of a thousand stanzas each, called *ślokas*.

Fragments only of the manuscripts are now extant. It was supposed to have been composed by Brahma, 900 B.C., and handed down to the Buddhists by the Brahmins. It was intended to teach the proper manner of preserving life, and the means of preventing and curing diseases. Dr. Wise, the author of the "History of Medicine among the Asiatics," says that it contained a description of the structure of the human body prepared from actual dissection, an account of the causes and diseases to which it is subject, the enumeration of many useful remedies, and precepts for preserving

health and curing diseases. The works studied by our *Vedarálas* in Ceylon now, are the *Śastris*, *Charaké*, and *Suśruta*, which are commentaries on the *A'yur-Veda*. The first is arranged in the form of a dialogue or conversations between *Atrya*, the master, and his pupils in their conferences. Sir Whitelaw Ainslie gives a list of twenty-one Sanskrit medical works, known in the early part of this century among the Siphalese and Tamil. There are no doubt several very intelligent and trustworthy *Vedarálas*, who are Sanskrit scholars, and study manuscripts on "olas," or leaves; but there are also a larger number of ignorant impostors in the villages, to whom the words of Job are applicable: "But ye are forgers of lies; ye are all physicians of no value!"

The Tamil books of medicine derived from the same source are published in the Tamil and other Dravidian languages. The Tamil practitioners are styled *Vayittiyan* and *Parikári*. The *Vayittiyan* of the Tamil people is largely engaged in treating infantile ailments, and many of them even confine their practice to children only of all classes, Muhammadans as well as Hindús. Those who take an interest in the Oriental system of medicine, and wish to pursue the study of the ancient Hindú, Buddhist, Arabian, and Chinese systems of medicine, will find a full account in Wise's "History of Medicine," published in 1867. The Moors or Muhammadans of Ceylon have their own native practitioners, who blend the Arabic with the Hindú systems of medicine. The recognised physician is called *Hakim*.

There were many kings of Ceylon who built hospitals and practised medicine themselves, and by their noble example made it an honourable profession. According to the *Mahá-waṅsa*, Buddha Dása, who reigned for twenty-nine years, from 339 A.D., was the author of a medical work called the *Sárārtha Saṅgrahaya*. Many wonderful cures are attributed to him. He built hospitals for every ten villages, and placed medical men in charge of them. They were to receive one-fortieth of the revenue derived from fields for their

maintenance. He also appointed medical men to attend on his infantry, and veterinary surgeons to attend on cattle and elephants. Along the roads he built halls for the lame and blind. It is said that "When he went out of the palace, his surgical instruments were always in his waist, and he operated upon all sick persons whom he met." King Agbo, who reigned six years, from 782 A.D., caused medicines to be distributed among the sick; and Dappula II., who commenced his reign in 795 A.D., is most highly spoken of in this respect, in the following words: "That most gracious Prince built a hospital at Polonnaruwa. He also in like manner built a hospital at Pandaviya, and endowed it with villages which yielded the necessaries of life. He also built in several places halls for the cripples and the blind. In short, he did not leave anything undone which was called meritorious; he even gave growing paddy crops to cattle, and rice, mixed with honey and sugar, to children."

Parákrama Báhu, who reigned from 1163 to 1196 A.D., built a large hospital capable of accommodating hundreds of patients, and appointed a manservant and maidservant to attend on each patient for the purpose of supplying him or her with necessaries of life and medicine. He ordered medicines and the necessaries of life to be made and stored in the hospital, and appointed skilful and salaried medical men to attend on the patients. Divested of his royal robes, he visited the hospital four times a month, and inquired into the nature of the disease of each patient, and the mode of treatment adopted; and whenever the treatment was in his opinion erroneous, he taught the physicians the proper method, and attended himself to some cases.

When the patients recovered, he distributed clothes amongst them. This prince is said to have cured a crow of a tumor, and the bird, it is stated, would not leave the hospital until attended to! Nor was sanitation ignored. King Pandukábhayo, who reigned 437 B.C., employed one hundred and fifty men to carry dead bodies to the cemetery, and one hun-



dred and fifty men as cemetery-keepers and sextons, besides two hundred night-soil men, a small number of day and night guards, and a small army of sweepers.

#### PORTUGUESE PERIOD.

In the history written by a Portuguese author, Juan Ribeyro, in 1685, there is only a very brief description given of the diseases which prevailed in Ceylon at that period, and I can find no allusion to the methods of treatment adopted by medical men of his own nation. The Portuguese priests and captains of companies appear to have been in medical charge of the garrisons of Colombo, Kalutara, Negombo, Batticaloa, Trincomalee, Jaffna, and Mannár.\* Ribeyro states that most of the Portuguese on their first arrival were subject to bowel complaints, fevers, and other diseases, to which the natives are not liable. He thought that the Sinhalese retained their health by frequent baths, and states that when he first came out to Ceylon he had two illnesses in the first two years. He then adopted the native habit of bathing twice daily, and during the sixteen subsequent years he lived here he never became ill. Frequent bathing is acknowledged to be one of the best means of preserving health, and is practised by the natives to this day; but it is in strange contradiction to the experience of an old colonist of 70 years, an Italian, now dead, who attributed his immunity from disease to his *never* bathing!

Ribeyro describes "beri-beri" (*bére-bére*) as a disease to which Europeans were very liable. He recommended as the best remedy pork and biscuit, with palm wine (toddy) and smoking, to be persevered in for three months. As a

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\* A correspondent points out that Le Grand has not followed Ribeyro accurately here. "It is not strictly correct to say that the Portuguese priests and captains of companies appear to have been in medical charge of the garrisons of Colombo, &c. Ribeyro (Bk. I, chap. xiii) distinctly says that when the soldiers were seriously ill they were sent to the hospital at Colombo, and that the surgeon had to certify the necessity of this: Le Grand omits this statement."—*Hon. Sec.*

prophylactic against this disease, the Captain General Antonio de Mascarenho issued an order for every one in the camp to smoke.

Ribeyro only briefly alludes to "Parangi" disease (*Parangi leða*), that unsightly and disfiguring skin disease which prevails to this day in the districts of Mullaittivu, Vavuniya-Vilápkulam, Anurádhapura, and Kurunégala. He called it the "Neapolitan disease," named by the natives "*Paranguelere*," or "Portuguese sickness," since the Portuguese first introduced it into this country; and he says it "is not easily cured."\* Fever is only mentioned, to be dismissed with its remedy, viz.:—a decoction called *coantru*.† Those who know Portuguese are aware that the remedy is a common and useful one, employed to this day. Coriander seeds boiled down with ginger into a decoction is commonly used in the cold stage of ague, and in catarrhs and colds in the head. Ribeyro states, as we can bear testimony even now, that no people understand the use of simples better than the Siphalese, so that with a few herbs or roots they cure wounds, ulcers, and swellings; but it is extravagantly stated that they set broken arms and fractured legs, and put those matters to right in a very few days. He also noted the good effects of herbs as antidotes against the bites of snakes and venomous insects. We must admit that many *Vedarálas* are good bone-setters, although they have no proper appliances for preventing shortening of broken limbs. Their method of stuffing a wound and keeping it dilated, when it is connected with a compound fracture (although aromatic, antiseptic, and astringent herbs are used to check bleeding and prevent putrefaction) cannot be approved except as a temporary measure, until proper surgical aid is obtainable. The historian

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\* The writer quotes Lee's translation of Ribeyro, which is merely Le Grand's version Englished. Ribeyro's actual words are:—"As mal gallico chamao *Parángue rere*," &c.—*Hon. Sec.*

† Ribeyro, "*coentro*."

must have been deluded, when he was induced to believe that cancers, which are considered incurable in Europe, were cured in a week in Ceylon. Ribeyro also alludes to the prevalence of small-pox, which the natives called "*ankaria*, or an affair with God," because it appears as if only a miracle can cure it.\*

The following sketch of the mission of Padre Vaz, a Portuguese Priest in Ceylon, who died in 1711, is taken from a Portuguese work written by Padre Dorego :—"The small-pox now visited Ceylon, and made fearful ravages. The people believing that all persons labouring under the disorder were possessed by the devil avoided them, as they would him ; the father ran away from his children, the wife from her husband, leaving them to perish without food : the sick perished, therefore, as much from hunger and panic as from the virulence of the disorder. The dead became so numerous that they were left unburied, or carried to distant places, while the poor wretches affected were driven by the Government into the jungle. When the contagion had reached Kandy, the king left it, as the stench of the dead bodies in the streets was unbearable. *Vaz* resolved to visit both Christians and Pagans, and being with provisions from his followers in Colombo, relieved their distress. He also followed the sick into the jungles, and building huts as well as time and place would permit, there sheltered them from the elements and the attacks of wild beasts : in a word, he contrived to supply every want, temporal and spiritual, performed the most menial services, opened hospitals in the deserted houses, and dared everything for their relief. The result was that members who were saved joined the Church,

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\* The same correspondent writes :—"This is Le Grand's statement. Lee in his translation of Le Grand did not attempt any explanation of this wonderful word *Ankaria* : what Ribeyro really wrote was *Deanéchariya*, i. e., *Deviyankâriya*. Le Grand apparently mistook the first syllable for the proposition *de*! (I may mention that I possess the MS. of Ribeyro's narrative used by Le Grand, and that it reads *deancharia* ; in this MS. the words are run together very much, so that there was some excuse for this blunder.)"—*Hon. Sec.*

and had their children baptized. Ribeyro's editor, Le Grand, speaks of the habit of betel chewing among the natives, Portuguese and Dutch; he thinks it a wholesome practice, which purifies the breath, strengthens the gums, and cleanses the bowels. The Singhalese at that time attributed their long and healthy lives to its use, and Ribeyro confirms it by saying that men and women were seen in Ceylon who had not lost a single tooth. We unfortunately know that the practice of betel chewing presents another side; it produces "betel-chewers' cancer."

#### DUTCH PERIOD.

The Leper Asylum at Hendala is perhaps the only monument of the medical history of Ceylon during the Dutch period which is left to us. There is no authentic record of its foundation beyond an inscription on a stone, "Anno 1708," and a monogram scarcely decipherable, indicative perhaps of date of building and of the original owner of the property on which the institution stands. It is generally believed, on traditional authority, that it owes its origin to a philanthropic Dutch lady, daughter of a Dutch Governor, who was herself a leper, and at her death left the property to Government, in trust for the pauper lepers of the Colony.

In a memorandum made by Governor Van Imhoff in 1740, he commends this institution to the care of his successor. Although frequent search has been made among the archives of the Government Record Office for documents or information relating to the transfer, nothing has come to light to show how the Government became possessed of a property sixteen acres in extent, occupying one of the most beautiful sites in the neighbourhood of Colombo, at the mouth of the Kelani river, admirably adapted from its situation, isolation, and distance from town for the segregation and treatment of lepers. This hospital was certainly the first in the Colony founded by private benevolence, and supplemented only of recent years by the foundation of other charitable institu-

tions, especially at the hands of the De Soysa family. In this Asylum, which has separate wards for lepers, and paupers suffering from incurable diseases, one hundred and forty-four remained at the end of 1885 and sixty-five were admitted during the year 1886, making the total number treated two hundred and nine : one hundred and ninety-seven lepers and twelve paupers. The patients treated in this institution, one hundred and seventy-six at present, are well cared for, and all that science and humanity can suggest is adopted for their comfort and happiness. The new wards are the finest of any in the Island, well built and well ventilated.

There is no certain information available with regard to the state of medical practice in this Island during the Dutch period, extending from 1656 to 1795. It is reasonable to suppose that there were army surgeons among the Dutch, as under the British, and that some of these were probably regularly qualified men from the colleges of Amsterdam, Utrecht, and Leyden,—with the latter of which the name of the great Boerhaave will ever be connected. There may have also been one or two civil practitioners, and these may have been assisted by young men of the country, who helped them behind the counter, and picked up a knowledge of medicines and their application. Among the hospital dressers and dispensers of that day, there were many who attained a certain eminence, whose names are yet recalled by old residents, who can remember them “with a touch of affectionate pride.” In those days the apprentice system was in vogue, and if there was no opportunity of walking the hospitals, there was, at least, for mixing and triturating drugs. Medical skill was empiricism, and although Stahl, Boerhaave, and Hoffman, with the ancient medical classics, might have been studied by a few old Dutch doctors who came to Ceylon, the probability is, that like the early British army surgeons, the Dutch doctors who came here were not university men. However, from the large number of those who took service under the British at the cession of the Island in 1795, it is evident that medical

science had made some considerable progress in the Island, and that many native and Dutch descendants had applied themselves to its study.

Dutch physicians have been noted for their knowledge of botany, and the extensive field afforded in Ceylon for its study was an especial attraction. The flora of the Island was arranged and described by Linnæus, with the aid of the celebrated herbaria collected by Herman and Hartog, both of whom were sent out to Ceylon by the Dutch East India Company, in 1671. It is also interesting to note that the first European writer on tropical diseases was a Dutchman named Bontius.\*

There are no records extant to show that any effort was made by the Dutch to teach the science of medicine systematically to the natives, but it appears that the kings of Kandy often requested through the Government the medical aid of Dutch doctors, which the Dutch Governor of Colombo complied with.

The mission of Doctor Danielsz and his apprentice to the court of Kandy in 1739, to cure the King Śrī Vijaya Rájasingha of a bad leg, as recounted in his journal, is replete with interest. The late Doctor Koch, in his introductory lecture delivered at the opening of the session of the Medical School in 1872, thus recounts the particulars of that memorable visit: "Doctor Danielsz went accompanied by his apprentice; but all he could see of his royal patient was the ailing limb. Under such circumstances it was impossible he could adopt any other course of treatment but what consisted of outward dressings. These he tried without any satisfactory results, and alarmed

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\* The same correspondent notes here:—"So far as I know, Dr. Vanderstraaten is correct in stating that Bontius was the first European writer on tropical diseases; but there was another medical writer on the subject, who followed not so long after, and whose work passed through several editions. I refer to Dr. Ægidius Daalmans, a native of Antwerp, who went to the East in the service of the Dutch in 1687, visiting Ceylon, Java, and India, and returning to his native land in 1689. Dr. Daalmans' book is very rare, the British Museum not possessing a copy."—*Hon. Sec.*

at the consequences of failure, he insisted on His Majesty taking a course of tonics. The decoction was prepared, but the king found it so bitter that he emptied the cup into the royal spittoon, suggesting that the doctor should employ the more agreeable article of arrack for the conveying of the nauseous potion. Doctor Danielsz hereupon brewed two bottles of bitters, but he prescribed so small a dose of it at a time (he calls it a small beer-glass full) that His Majesty demanded either a double dose or to be allowed extra liquor over the bitters ; after a good deal of resistance the doctor was at last compelled to yield, and as he said he was himself in the habit of taking a *schnap* before meals, his patient also might, but positively not beyond the third day. In the meantime the leg was not improving, and the *régimen* was becoming intolerable, and so Doctor Danielsz was bid prepare to leave Kandy ; and, if he could not congratulate himself on his professional success, we may yet suppose he was glad enough to escape the attentions of his patient, which now began to assume a form slightly more imperative than was altogether pleasant. So Doctor Danielsz and his apprentice returned to Colombo, and continued no doubt to adorn the profession till the natural close of his not uneventful life."

#### BRITISH PERIOD.

Mr. Henry Marshall, Surgeon to the Forces, who served here from 1808 to 1821, has left us a valuable work on the " Medical Topography of Ceylon, and on the Health of the Troops employed in the Kandyan Provinces from 1815 to 1820, with brief remarks on the prevailing Diseases." From this work I have gathered some interesting passages. The troops employed during the early British occupation consisted of Europeans, Caffirs, Malays, and natives of India. Marshall says that the individuals of each class preserve a strong physical and moral resemblance, using the same food, having similar wants, undergoing the same labour, and suffering the same privations. Each class had particular

prevailing diseases, according to the effect of the climate, exposure to malarious influences, and variations in their food-supply. The Europeans suffered from the endemic intermittent and remittent fevers, abscess of the liver, and dysentery, but they were greatly exempted from many diseases to which they are liable in their own country. A large number of British soldiers suffered from the effects of intemperance added to the effects of the climate, and no wonder when arrack was then retailed at sixpence a quart! It was Marshall's opinion that the regular issue of spirit rations engendered the desire for the immoderate use of spirits, and that frequent indulgence created a craving which had to be supplied. The same sad tale of spirit drinking, as one of the principal causes of sickness and mortality among the troops in Ceylon, is repeated in the Military Sanitary Report for 1864. Five per cent. of the troops were then reported to be confirmed drunkards.

Africans, called at that time "Kaffries," and who composed five companies of the 2nd Ceylon regiment, the remains of two other regiments 3rd and 4th, were chiefly recruits procured on the east coast of Africa, in the neighbourhood of Mozambique. A few of them were evidently children of Africans brought here by the Dutch. They made good soldiers, and were remarkable for longevity. They were habitually temperate; but the Malay recruits from Java and Sumatra, for the Ceylon regiments, were addicted to the use of bhang and opium. Although the immoderate use of these narcotics was nearly as hurtful as the free indulgence in spirits, the excessive opium eaters among the Malays were less numerous than the immoderate drinkers among the European troops. They were liable to intermittent fevers or ague when exposed to malaria in the jungle; inflammation of the lungs, consumption, asthma, and pocky-itch, so called by Mr. Marshall from the eruption leaving deep marks on the skin. The Indian troops, who formed the corps of Gun Lascars, the Pioneer Corps, and five companies of the 2nd Ceylon



regiment, came from the Madras Presidency. They were a useful addition to the garrison, and were capable of much exertion when kindly treated. They were sober, temperate, and submissive, but extremely filthy, and owing to their neglecting to provide against sudden changes of temperature, were more liable to intermittent fever, inflammation of the lungs, dysentery, and diarrhœa; Malabar itch was, as may be expected, very common among them.

Distress was caused in 1812, 1813, and 1814 by repeated droughts resulting in failing of the crops of rice. It was deplorable, says Bertolacci, to see the numerous children of the Ceylonese families reduced and emaciated for want of food, and depending upon parents who were in no way able to provide for their large families. No substitute could be found for the staple article of diet for the native troops, and consequently privation and exposure led to much suffering. At Minery, between Kandy and Trincomalee, fifty-three men of the 19th regiment were attacked with fever, thirty-three died, and twenty recovered; but several of them had their constitutions much impaired. Of thirty-three artillery men, eleven died.

In December, 1820, there were thirty-two military stations in the interior, the chief posts being Kandy, Badulla, Aliput (fifteen miles east of Badulla), Ratnapura, Fort King and Kurunégala, all of which were hospital stations. The Rev. Mr. Cordiner records that a small outpost in 1803, Koṭṭadeniya (thirteen miles from Kurunégala), was so unhealthy that of seventy men of the 65th regiment who marched to it, every one was seized with fever, and within a month Lieutenant Hutchings and two privates were the only persons of the party who remained alive.

It will be interesting, before proceeding further, to glance at the nature and extent to which the principal diseases which existed in Ceylon prevailed in the earlier years of the present century, soon after the British settlement in this Colony. Davy considered the effects of the climate of Ceylon

under three heads : "First, those which occur immediately ; second, those which are produced slowly and gradually ; third, those which arise occasionally and unexpectedly from the agency of peculiar causes. As to the immediate effects which result from the transition of the body from a temperate climate into a tropical one, we have ample evidence derived from the accounts of voyagers ; such as disagreeable sensation of heat, acceleration of the heart's action, increased perspiration, langour, restlessness, and thirst, diminished appetite and general indisposition"; but these do not constitute actual disease, nor do they necessitate active medical treatment. "Europeans landing in Ceylon are liable to few ailments due to immediate causes." Prickly heat (*lichen tropicus*) is perhaps the most common. "During the wet seasons," says Percival, "the Ceylonese are subject to a variety of diseases. Every man is here his own physician, and the mode of cure adopted is of course very simple. A plaister of herbs is applied to the part affected, and I have seen the same remedy applied to a man in a high fever, when his whole body was daubed over with this ointment. A skill in medical herbs is almost universal among this race, and they have a variety of prescriptions for curing diseases by their application. This knowledge is owing to their peculiar fondness for gardening, rearing all sorts of plants, an employment in which they are engaged from their infancy, and it is from among them that the European gentlemen are anxious to procure their gardeners."

Small-pox seems to have been, as it still is now, the most dreaded disease. It has doubtless been the one great cause of the depopulation of the Island, and Forbes thinks it was this visitation which was described as the "red-eyed demon of pestilence" that swept the country of half its people in the third century, under the reign of Śrī Sangabo. It is called *mahá ledda*, or "the great sickness," and is believed to be "a direct infliction of the gods." Percival states that persons dying of this disease were considered

accursed, and that, viewed as a means of God's vengeance, no attempt is made by incantations and exorcisms, as is done in other diseases, to propitiate the gods. Even the rites of burial are denied, the body of the dead being removed to a distant jungle, and then left covered with bushes and branches of trees to decompose. The goddess *Pattini* is believed to have the peculiar power of averting or preventing small-pox, and to her is dedicated a temple situated in the forests on the side of Ambokkekanda, where also stands the remains of *Ragula Nuwara*.\* Pridham relates that during the prevalence of small-pox at *Mátalé*, the *Kapurála*, or lay priest, of *Ambokké*, was in constant request, and reaped an abundant harvest from the terror and superstitions of his neighbours. Every village in the vicinity of an infected place, by means of presents nominally offered to the goddess, but the most valuable of which were appropriated by the *Kapurála*, procured his presence; and the relics from the temple, consisting of a shield and bangle (amulet), were borne through the village followed by all the inhabitants, and duly honoured by the noise of every tomtom, pipe, shank, shell, or trumpet which they could procure. The *Kapurála* had been at a former period afflicted with the natural small-pox, and was shrewd enough to have his whole family vaccinated, though his supposed temerity in visiting infected villages, and his good fortune in escaping contagion, were accounted for by himself, and believed by the people, to arise from the protection of the goddess. His influence was hence considerable, and his selfishness led him to use every secret means of checking the progress of vaccination among the dupes, by whom he was enriching himself.

Active measures in the prosecution of vaccination, the introduction of legislative measures to help on this good work, and to enable those in authority in the exercise of a wise discretion to isolate and effectually segregate the

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\* See R. A. S. Journal, No. 29, 1884, pp. 368-394.

infected, have diminished the horrors of epidemics of this disease, and in the present day a scene like the following, as described by Forbes, cannot be expected to occur: "I found," he says, "lying in a field, with her head close to a well, the body of a woman who had but lately expired. Tormented by thirst and deserted by her friends, she had crept to the water, whilst in the last agonies of this loathsome disease. By permission of her relatives I offered her property, including a portion of land, to whoever would bury the body, but all my arguments and entreaties would not induce anyone, even the most wretched pauper, to acquire a competency by burying it."

Cholera, as an epidemic disease, has at different times made fearful havoc in the Island. Marshal states that epidemic cholera having prevailed in 1817 in India, broke out at Jaffna and Mannár in 1818. It subsequently appeared in Kandy, Colombo, and other garrison towns, a few only of the smaller outposts in Sabaragamuwa, &c., escaping the infection. One of the earlier outbreaks occurred in 1832, at Trincomalee, when it decimated the detachment of the 78th Highlanders at that time stationed there. A very eminent medical man, who had examined the military building at Trincomalee at this time, gave the late gallant Admiral Sir John Gore, his opinion in the following emphatic words:—"The position and construction of the barracks are admirably adapted for originating, and the hospital for maintaining, disease." Subsequent and later epidemics will receive notice under their respective years of occurrence.

*Berry-berry, beri-beri, or bere-bere*, prevailed in Ceylon during the earlier part of the present century. It receives notice from Percival (in 1803), who states that it was occasioned by "the low diet and bad water which the natives are accustomed to use, and in part, perhaps, by the dampness of the climate in the wet season. It swells the body and legs of the patient, and generally carries him off in twenty hours." In his time the plan of treatment was to rub the

patient over with cow-dung, oil, chunam, lime juice, and other preparations from herbs, and then bury him up to the chin in hot sand.

I shall now attempt a cursory notice of the principal events in the medical history of Ceylon, gathered from official documents.

Vaccination was introduced into Ceylon as early as 1802. According to Bertolacci, who wrote in 1817, the population of Ceylon eight or ten years prior to that date was calculated at 700,000. The number vaccinated between 1802 and 1812 was 221,082, and it is stated that the efforts of the British Government to eradicate small-pox by means of vaccination were so successful that for eleven years the disease did not occur in Ceylon. The low-country Siphalese, when they found by experience the protective benefits of vaccination, crowded into the British settlements for the purpose. The Kandyans, or natives of the hill country, who had been at enmity with the Portuguese, Dutch, and British, still kept aloof from communication with the Maritime districts; but, though they did not acquire the direct benefits of vaccination, they were free from the disease when it had been eradicated by the prophylactic in the low country. They used to drive their small-pox patients into the jungles of the low country.

In 1803, Mr. Percival, an officer of the 19th regiment, suggested that vaccination should be made compulsory (sixty years afterwards, in 1863, it was made compulsory by Sir Charles McCarthy); in 1837, Dr. Kinnis, of the Army Medical Department, wrote a long letter to the inhabitants of Ceylon on the advantages of vaccination. It was translated into Siphalese, and must have done much good in making the benefits of vaccination generally known.

The first mention of the Lunatic Asylum occurs in the speech of Sir James Stewart Mackenzie, delivered before the Legislative Council in 1839. Up to that time insane persons had no special hospital provided for them, the common jails, and for a period, the Leper Asylum at Hendala, being

used for their safe custody. In "earnestly pressing for adoption," the draft of "An Ordinance to establish Lunatic Asylums," His Excellency said that "the cases of distress and misery from time to time brought to the notice of Government, prove beyond a doubt that the time has arrived when it has become imperative for the protection of those unfortunate persons, and, in some cases also, for their maintenance and support." Not long afterwards, under the *régime* of the same Governor, arrangements were completed "for the purpose of receiving those unhappy lunatics, who," to use Sir Stewart Mackenzie's own words, "are rather numerous, and from various parts of the Island are now boarded, lodged, fed, and taken charge of at a much larger expense than if they were under one superintendent for the males, and another for the females, in buildings contiguous to each other. All this is now done in a most unsatisfactory manner in respect to health, cleanliness, and every requisite for such an establishment."

The cost of converting the small-pox hospital at Borella into a lunatic asylum was estimated at £2,000, and this alteration was ultimately carried out satisfactorily. Since then this building, which was added to and enlarged from time to time, served the purpose until growing needs and advance in sanitary science, led to the adoption of a fresh site and improved architectural plans for the present new asylum situated at Jáwatta. There are now 353 patients in the old and new asylums. On the opening of the Borella Asylum, in 1847, the Government placed the institution under the medical care of a specialist, Dr. Davy, who was sent out from England. The appointment, however, on being subsequently vacated by him, passed into the Medical Department, Mr. Ebert being appointed to the post in 1849. Under the care and supervision of successive officers of the Civil Medical Department, everything possible was done that could conduce to the comfort and well-being of the unfortunate inmates.

\\ The administration of Sir Stewart Mackenzie, and the year

1839, was further marked in medical annals by the first mention in His Excellency's speech to Council of a Medical School for Ceylon, and of certain measures to be adopted by Government, which afterwards contributed in a very great measure to the efficiency of the Civil Medical Department.

His Excellency then said :—"The evident inadequacy of the former rates of salaries, to ensure the services of persons duly qualified in point of professional attainments and general respectability, left no doubt in my mind of the necessity of increasing the remuneration of the native medical establishment ; and while a higher scale of salaries was introduced, steps were taken to ensure to the junior members a regular course of instruction, both by the Military Medical Officers serving in the Colony and at the Colombo Academy. I also took advantage of the means of education Calcutta afforded to medical students, by sending certain more advanced youths to be educated there at the expense of this Government, with a view to employment in the Colony on their return. The Home Government has directed me to submit to you these arrangements, involving as they do an annual expenditure of about £3,500. It is for you, gentlemen, to declare whether this Colony does not stand in need of an efficient class of medical practitioners." His Excellency, in alluding to the necessity of a School of Medicine, added that he hoped the time was not far distant, when he should be able to propose to his Council, in furtherance of his views for the improvement of the class of medical men in the Department, the establishment of an Anatomical School ; and it was even suggested that certain alterations might be effected in the late Pettah Hospital (at present the headquarters of the Ceylon Light-Infantry Volunteers) for this purpose ; or failing this, that Her Majesty's Government would sanction "there being attached to the Colombo Academy such a system of medical education as will provide the means of adequate instruction in the medical profession in future for the Colonists, without their leaving their native

Island." Sir Stewart Mackenzie predicted what has been fulfilled. "I need scarcely add," he said, "that if these measures are successful, they will become the means of opening to the inhabitants of the Colony a new and most useful branch of professional employment."

Very few are now alive, who, under the designation of "Medical Sub-Assistants," served under Military Medical Officers, heads of the old Department. One of the earliest lists of the officers of the Civil Medical Department which I have been able to find is that for 1817. Between this date and 1858, when the Civil Medical Department became a distinct establishment, a large number of individuals, natives of the country, were educated and trained under Military Medical Officers. Many of these Military heads of the department appear to have been as kind-hearted as they were eminent for their scientific attainments, and the members of the subordinate department who still survive speak with a respect and affection of Forbes, Stewart, Barclay, Kinnis, Rowe, Ferguson, Templeton, Cameron, Fleming, and others, who, while ruling the department wisely and well, took a personal interest in the welfare of their subordinates.

Dr. Kevett, in 1835, was the first who attempted to organise a medical class. His pupils were the late Mr. Ferdinands of Kandy, E. F. Kelaart, P. H. Van Cuylenburg, M. B. Misso, Trask, Cleveland, and Ebert of our service. Of this number, Kelaart having obtained the opportunity of a free passage to England, as surgeon's assistant, accompanied the 78th Highlanders, and returned with a Commission as Staff Assistant Surgeon in 1840. Dr. Kelaart may, therefore, be considered as the first Ceylonese who acquired a British Medical degree; and his career as a physician and a naturalist was distinguished. His work "*Prodromus Faunæ Zeylanicæ*" is a monument of his talent and industry.

The slight attempt at imparting medical knowledge which I alluded to, was shortly after followed by a regular class for



the systematic teaching of the science of medicine under Staff Assistant Surgeons Templeton and Cameron, under the supervision of Dr. Arthur Stewart. The lectures delivered were mere explanations of the contents of text-books. This plan of educating medical officers was but partially successful.

The clinical teaching at the Military Hospital, Colombo, not being found to answer as fully as desired, the Government determined to send students to Calcutta for their medical education. It was not until the beginning of 1843 that graduates of the Bengal College joined this service, and among them may be specially mentioned the names of Drs. Anthonisz, Loos, Dickman, Kriekenbeek, Ondatjee, Andree, Wambeck, Markus, Margenout, and Breechman, who have all, either by death or retirement, now severed their connection with a department they served honourably and usefully, the first two having had the distinguished privilege, upon more than one occasion, of administering the Medical Department, during the temporary absence of its head from the Island. Speaking of his predecessors, Dr. Koch, himself a graduate of Calcutta, says in his lecture : “ Nothing conduced more to familiarise English practice amongst the natives of the Island than the services of these young men on their return. They undertook and performed with success the most formidable surgical operations, and the name of Dr. Anthonisz will always be connected with the first successful cases of œsophagotomy and ovariectomy in Ceylon. <sup>^</sup> Indeed, if I am not mistaken, the first-mentioned operation was the first successful one of its kind ever recorded in the whole annals of British surgery.”

Dr. Ondaatje was Acting Superintendent of the Royal Botanical Gardens at Pérádeniya in 1843-44, before the appointment of Dr. Gardener, and he has since given proof of his intimate knowledge of the productions of the country, and their economic uses, in his contributions to the Journal of the Asiatic and other societies.

Much attention was devoted in 1852, during the administration of Sir George Anderson, to the operation of the quarantine laws, and the improvement of the drainage system of the capital. That pestilential ditch in the Pettah, misnamed "St. John's River," was entirely covered in, several new streets were opened, drainage on an extensive scale was planned, both by the opening out of new drains and the widening of old ones; indeed, at no great cost, much was done to increase the salubrity of the town and the comfort of its inhabitants.

Various sums were from time to time voted by the Government of Sir Henry Ward for the improvements of Civil Hospitals. The state of the Pettah Hospital, then the General Hospital of Colombo, was not creditable to the Colony, and a sum of £3,000 was voted for the purchase of a better site in the suburbs. It was after this that the present General Hospital was built, and opened in 1864.

In 1857 a Select Committee was appointed by the Legislative Council to report upon the Fixed Establishments of the Colony, and one of the recommendations made was that the Civil Medical Department should be separated from the Military Medical Department, and placed under the control of a Civil Medical Officer, as the existing Civil Department was insufficient for the requirements of the Island, and the military heads of the department were shifted too often for opportunities to acquire local experience. A Civil Medical Establishment was proposed, consisting of a Principal Civil Medical Officer, two Colonial Surgeons, eight Assistant Colonial Surgeons, and twenty-eight Medical Assistants, all with salaries adapted to secure efficiency and ability. Dr. Elliott, eminent in Ceylon as a public man, and well-known for his ability and philanthropy, was in England when the report was published, and he lost no time in applying to the Secretary of State for the Colonies for the new office of Principal Civil Medical Officer. He was appointed, but his tenure of office was unfortunately too short to enable

him to carry out several beneficent plans. He died, deeply regretted, on May 22, 1859.

In 1865 cholera broke out in a severe epidemic form at the pearl fishery, and rapidly spread to Trincomalee, Negombo, and Colombo. In the following year it occurred in all the principal jails, but with care and attention it did not spread, and there were but seventy-seven cases among prisoners, with thirty-one deaths. The visitation was of a sporadic character, until the close of that year, and then broke out severely in an epidemic form in the Northern Province. The whole of that Province was rapidly affected, but the disease established itself more particularly in the Peninsula of Jaffna; 9,092 cases occurred in the Northern Province, 8,696 of which were in the Peninsula of Jaffna, and 473 proved fatal. The disease was so much on the increase at the close of the year that His Excellency Sir Hercules Robinson appointed a Commission to visit Jaffna and report upon the causes which led to the outbreak of cholera in that peninsula. The Commissioners worked with much zeal and assiduity, conducted their inquiries on the spot, and after personal inspection of the localities which suffered most severely, and examination of the leading and well-informed persons of all classes of the community of Jaffna, drew up a voluminous and valuable report, which was laid before the Legislative Council. The report consists of the history of the epidemic, the modes of treatment adopted, the customs and habit of life of the people as bearing on the epidemic, recommendations for the sanitary improvements of the town and villages of Jaffna, and measures of precaution to be adopted against future outbreaks. In the Northern Province 10,064 cases occurred during 1867, of which 6,862 died. The remaining provinces suffered comparatively little, the total in these being only sixty-three cases, with forty-two deaths.

In 1867 Sir Hercules Robinson ordered an inquiry into the causes of the depopulation of the Vanni, and this investiga-

tion, on the recommendation of Dr. Charsley, was entrusted to Dr. Loos, then Colonial Surgeon of Jaffna. The conclusion he arrived at, after a careful inquiry, was that the depopulation was due to malarious fever and to the prevalence of an inveterate skin affection, possibly associated with an hereditary specific taint, aggravated by insanitary conditions, and known in that district as the "Paraggi-disease." His report on this subject is well worthy of perusal. The duty entrusted to him was performed in such an efficient manner that he received the special thanks of the Government; and his report was submitted to the Legislative Council, printed and circulated among the members of the department and others. In accordance with his suggestions, new hospitals at Mullaitivu, Anurádhapura, and Vavuniya-Vilápkulam were established for the treatment of cases of this disease. It was, however, at the special desire of Sir William Gregory that more extended efforts were made during the year 1872 to afford medical aid to those suffering from Paraggi; and Dr. Danforth, a very efficient medical officer, educated under the American missionaries, was placed at Vavuniya-Vilápkulam to study the disease, and afford aid to sufferers. Dr. Kynsey wrote a very elaborate report embodying the observations and experience of all the medical officers who had opportunities of studying this disease. He had a series of drawings made illustrative of the disease in its various stages, and presented it, through Government, to the Royal College of Physicians, London. Dr. Kynsey's report is among the Sessional Papers of the Legislative Council, and is a complete history of this curious and loathsome disease.

In 1870 a milder epidemic of cholera prevailed in the Southern Province. It broke out at Kattragama during the Hindú festival there, and followed the track of the returning pilgrims.

Whenever cholera is prevalent on the south coast of India, it generally finds its way into the Island through the medium of the immigrant coolies, who land at Maññár and

travel along the great Central-road to the Eastern Province. There are five immigrant hospitals along this road, where sanitary precautions are taken, and great attention paid to the comfort and health of the immigrant coolies on their long march from the coast to the coffee estates.

It was in 1869 that the new hospitals at Kandy, Gampola, Badulla, and Ratnapura were completed and occupied ; since then new hospitals have been erected in the towns of Galle, Mátara, Negombo, Mátalé, Kurunégala, Batticaloa, Puttalam, and Kalutara. These new hospitals have been constructed on the pavilion principle, each ward being a separate detached building, and the ventilation and drainage are satisfactory. The pretty little hospitals at Pánaduré and Mára-wila are gifts of the late Susew De Soysa, Mudaliyár, and the Lying-in-Home was built by Mr. C. H. De Soysa.

The year 1870 marked a new epoch in the medical history of Ceylon. To Sir Hercules Robinson belongs the credit of sanctioning the inauguration of the Medical School, which was raised to the dignity of a College in 1880, when the late Sir John Douglas, K.C.M.G., was Lieutenant-Governor.

Thanks to the liberality of one of our well-known public-spirited fellow townsmen, who granted a free site opposite to the Civil Hospital, this school now has a local habitation. Government voted a sum of R12,000 for the erection of a building on this site, which now contains lecture-rooms, library, anatomical, physiological, and chemical laboratories. Mr. Sampson Rajapakse's name has further been associated with this institution for the last thirteen years, as he is also an annual donor of a prize of R100 for the best student in Obstetric Medicine. The late Susew De Soysa, Mudaliyár, built the De Soysa Museum and Library, at a cost of R12,000

This College has been in existence for sixteen years and has prospered. Dr. Loos had the honour of being its first principal, and he vacated the office on his appointment as Colonial Surgeon of the Central Province in 1876, when

the late Dr. Koch succeeded him. The untimely death of this talented officer in December, 1877, from the effects of a dissecting wound, is still remembered, and the handsome memorial tower erected by public subscription, to hold a valuable and massive clock, granted by the Government of Sir James Longden, will remain a monument to his excellence and usefulness.

We have now fifty-nine licentiates on our register, twelve of whom have succeeded in obtaining British qualifications. A number of hospital assistants from the secondary class are also employed all over the country.

The reorganisation of the Civil Medical Department in 1873 testified to the desire of Government to place it on a more efficient footing, and make it more useful to the Colony. The Administration Report for the year 1873 was the last furnished to Government by the late Dr. Charsley, who retired in 1874, but did not live long to enjoy his well-earned pension; he died at the Cape in 1880. It is impossible to avoid adding a tribute to the able and conscientious manner in which he discharged the duties of the high office which he held in this Island for a period of fifteen years. Dr. Kynsey succeeded him, and took up his appointment as head of the Civil Medical Department at the end of March, 1875.

Mr. Joseph Fernando, of Moraṭuwa, erected a building at Béruwala, and the late Mr. Harmanis Dias one at Baṇḍāragama, in Rayigam Korálé, for outdoor dispensaries. The friends of Dr. Anthonisz have given us two comfortable wards at the General Hospital. Of 156,693 patients treated last year in the forty-five outdoor dispensaries scattered over the Island, 13,010 were attended to at the Béruwala dispensary, which was the largest number treated at any place during 1885.

This concludes a hasty sketch of the principal medical events of the Island. We have reason to be grateful to a paternal Government for the deep interest it has always

taken in the health and well-being of the people, and for its efforts to remove and mitigate evils or causes of disease and mortality.

To the Legislative Council we are indebted for the liberal votes made from year to year for adding to the requirements and comforts of our hospitals, and providing for the sanitary condition of our prisons. That Government has as little to do with charity as with religion, is little remembered by the public of Ceylon. In England, hospitals and dispensaries are supported by voluntary contributions, and large bequests are made by the wealthy for their maintenance and efficiency; whereas in this country, the duty as well as privilege of the rich to provide for the poor is not recognised sufficiently. Beneficence is not without reflex influence on the benefactor. The good Samaritan, who gave pence to support his neighbour, and poured oil into his wounds, "showed mercy on him," and Shakespeare says of mercy:—

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"It is twice blessed,  
"It blesseth him that gives and him that takes."

It would be well if more of our well-to-do citizens followed the noble example of Rajapaksa, the De Soysas, Joseph Fernando, and Harmanis Dias. These are the true benefactors of the people.

The wise and judicious Ordinances which have been enacted may also be viewed in a sanitary light. I need only allude to the Ordinances on compulsory vaccination; for establishment of Municipalities and Local Boards of Health; restricting the use of opium and bang; regulating the sale of poisons; Medical Aid Ordinance for the planting districts; for administration of village communities; regulating the sale of intoxicating liquors; registration of births, marriages, and deaths; quarantine; irrigation; contagious diseases; and for regulating pilgrimages; nor must I omit to mention the advantages we have derived from the appointment of commissions of inquiry on cholera, prison discipline, and on irrigation.

On the whole, I may say we have no reason to be ashamed of the medical institutions of this Colony. We have one Leper and two Lunatic Asylums, twenty-seven Civil Hospitals, six District Hospitals, and forty-five Outdoor Dispensaries. Our prisons are now model institutions, and while stringent measures are adopted by strict penal discipline to make punishment what it should be, a deterrent from crime, every endeavour is made to ensure the health and maintain the physique of the convict, and thereby render him fit for the hard labour he has to undergo. Juvenile prisoners have been long carefully separated from old offenders, and confined in a separate department of the prison; and an Ordinance has lately been passed for securing their reformation in a Reformatory, and in Industrial Schools. Almshouses for the aged and infirm are urgently required, and have yet to be provided. Friend-in-Need Societies have done much good in the time past; but these institutions cannot now cope with the increasing destitution from the rapid increase of population, and from want of employment. The private charity of the more wealthy members of the community is needed, and must be systematically afforded in lieu of the indiscriminate almsgiving, long the practice of the country. The prevailing distress from poverty and want of employment, however, is such that measures on a larger scale must be devised by the Municipalities, or by Government, not only for the relief of indigence, but for the removal of the causes of pauperism, which invariably produces crime.

Civilisation and its advantages enjoyed by those in large towns have yet to be extended to rural districts, the koralés and pattus of the various provinces, where, at times, under the influence of drought and unfavourable seasons, sickness occasionally breaks out, and decimates the population. This was remarkably the case in 1864, 1866, and 1875, when fever and dysentery were so remarkably rife. The people were not on these occasions uncared for and left to perish of sickness and starvation. Food was provided by Government;



but medical aid could be given only partially, as the prejudices of the people were then found to be strong against the use of European drugs. With time and better agents for dispensing remedies, these prejudices are being gradually overcome. There are fortunately at the same time influences at work to enlighten and elevate the population. The country is being gradually opened up by roads and railways, and little towns are springing up where formerly there was jungle. Irrigation works are being gradually restored, and will in time reclaim wild and uncultivated wastes, formerly inhabited, but which may now be said to be "pathless forests." We may yet hope that ere long the measures adopted to advance the material interests of the country will help "to scatter plenty over a smiling land." Our missionary societies are extending their operations into the far interior, so that moral improvement, as well as material advancement, may be anticipated. But the means of abating deadly disease are still the feeble simples of the Vedarála, and the charms and incantations of the devil-priest. Shall we not aid the Christian missionary in his work, if, like the "Great Exemplar," we be not at the same time missionary and physician? The good work has been commenced in the Medical College. Let us hope that in time the licentiates of this institution will multiply and be found in all parts of the Island, possessed by knowledge which will enable them to combat disease in its varied forms; safe advisers, who will teach the people to avoid the causes of disease, and thus afford to them the blessing of preventive as well as curative medicine.

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## THE VEÐDA'S OF CEYLON.

By C. J. R. LE MESURIER, ESQ., C.C.S., F.G.S., &c.

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SOME years ago, while arranging the records of the old Kandy Kachchéri, I came across an account of the Veðdás, written, so far as I can remember, in the form of an official report to the resident at Kandy in the year 1820. By the permission of the then Government Agent, I took a copy of this document, and since that time have had several opportunities of verifying the information it contained.

I do not think the account has ever been published, at least I can find no record to that effect, and I venture therefore to offer it in the form of a Paper to the Asiatic Society.

I have myself, on several occasions, come across the hill or rock Veðdás, while shooting on the borders of the Central and Eastern Provinces. My first introduction to them was on this wise.

I was tracking up an elephant at some distance from the Pattipola ár, where my camp had been pitched. We were in the midst of a dense forest, when I suddenly heard the sound of an axe. The elephant had heard it too, apparently, for just about this time we saw from his tracks that he had bolted, and we therefore gave him up.

Turning to my tracker, I asked him who was cutting trees in this out of the way forest, and he replied that it was, he thought, a Veðdá. I at once dashed off towards the sound, to see what was to me then a curio; but the tracker promptly stopped me, and said, "That is not the way to catch a Veðdá: he will bolt the instant he hears you, and you will never see him. You must come like this," whereupon he went down on his hands and knees, and crawled

towards the sound. I followed suit, and when we were close up we "rushed" our man. He was in a terrible fright at first, but we soon quieted him, and the tracker, who knew his patois, acted as interpreter between us. After a few words I asked him if he was alone. "No, he had his wife and children, and his brother and his brother's wife with him." I asked him to go and bring them, and he left us for about half a minute, and apparently without a word being spoken, returned with another man, two women, and two children, one being at the breast. A present of tobacco all round, and a few more words and promises of food, &c., from me made them quite friendly. The men visited me in camp next day, and were very useful in the field, from their knowledge of the country and where to find game. Since then, I have come across Vēddás on several occasions, and the result of my personal experience is, in the main, to confirm the accuracy of the following account:—

The Vēddás of Ceylon are thought by many to be the aborigines of the country, and their appearance, customs, and language certainly warrant this belief.

They are of two distinct classes, (1) the village, and (2) the rock or hill Vēddás.\*

(1) There is very little social intercourse amongst the pure village Vēddás. They are said never to meet for any purpose of festivity. They subsist on the game they kill, on the fish they catch, on the roots and seeds of certain aquatic plants, and on yams and other jungle plants and creepers. The country in which they live abounds with elk, deer, wild hogs, hares, monkeys, porcupines, iguanas, peacocks, and jungle fowl, all of which they kill with bows and arrows, except the iguana, which they run down, or "tree," with

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\* The village Vēddá differs but very slightly now from the ordinary Sinhalese villager of the interior. Most of the old village Vēddá families have either become incorporated in the surrounding villages or have retreated further into the forest, and become hill Vēddás.

their dogs. They cut the flesh off the larger animals into steaks, and dry it in the sun. In this state it is eaten raw, seasoned with honey or salt, when they can procure it. They eat the flesh of the iguana fresh, but broiled. They also pound to powder the rotten wood of a tree called *bala*, which is said to be like the *kēkuna*, or country walnut. This they knead into a paste with honey, and then bake into cakes. They are, however, said not to eat this unless they are in want of something more nutritious and palatable, and they explain the addition of the rotten wood to the honey by saying that it is required to fill the stomach. They do not eat the flesh of the ox, the buffalo, the panther, or the bear. Some of the more civilised of these Vēddās cultivate small patches of kurakkan (a small kind of grain) and Indian corn, and a little tobacco and cotton. They flay the deer, but not the elk. The skin of the latter they dress and eat after singeing the hair. When they have the flesh of these animals in plenty they dress it by boiling, but more frequently by roasting, and the flesh of recently killed animals thus dressed appears to be considered a luxury. When all other means of sustenance fail them, they boil the leaves of the *kora* and *tora* trees, which grow in abundance everywhere in the jungle.

They never kill or catch the elephant. They do not use firearms, and their bows and arrows are not intended for so formidable an animal.\* They always avoid him in consequence. The bear and the panther are their most dangerous enemies, the former especially.† Many of the Vēddās bear the marks of conflicts with it; but with his axe, which with its short handle is an efficient weapon of defence against an animal that closes with his enemy, the Vēddā generally

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\*They are very bad shots with the bow, and they never "fire" until they are within three or four yards of their game.

†They have a number of charms against these animals, the principal ingredient in them being noise.

comes off victorious, though often severely lacerated, and that usually about the face.

They barter their deer skins, dried flesh, cotton, and honey for rice, kurakkan, tobacco, salt, cloth, arrowheads, and axes. They carry on this trade with the Siphalese and Moormen in their neighbourhood. They exercise no art or handicraft but that of making their bows and arrows. The heads of the latter are made by the Siphalese blacksmiths. They all have an axe, and some few of them possess a small hoe; but they make little use of the latter in the cultivation of their lands, all they do previous to sowing the crop being to cut the jungle and burn it. They are fond of salt, but as frequently it is not to be had in their neighbourhood, the only seasoning they have for their food is honey.

They are passionately fond of tobacco, and would use betel could they procure it. They, however, find a substitute for it in the bark of certain trees,\* which they chew with their tobacco. They do not practise smoking, they have no knowledge of intoxicating liquors, and drink nothing but water. They never cultivate paddy, the reason they give for this being that they are much fonder of hunting. They never do and will not apply themselves to any sort of labour, except now and then to a little high-land cultivation, and that never exceeds a rood or two for each family. They keep no domestic animals excepting dogs, and sometimes, but very rarely, a few fowls. Their huts are constructed in a very rude manner, some of them being a mere roof composed of three or four sloping poles, one end of which is placed in the ground, and the other end is supported by a cross stick placed on two perpendicular ones. Others have a perfect roof coming down to the ground on both sides, like the old military tents. Their huts are generally covered with the bark of trees, but sometimes with dried grass or straw. They never

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\* It was while stripping one of these trees of its bark that I first came across them.

remain more than a few months in one place, and often shift their residence more frequently.

The men wear a string round their middle, with a piece of cloth of the width of four or five inches passed between the legs, a flap of which about eight or nine inches long hangs over in front. The women wear a piece of cloth about the size of a small handkerchief, and in the fashion of an apron. The hair of both sexes is never combed, and is disgustingly matted and filthy. They wear no ornament in the hair, but sometimes tie a string round the head to keep the hair out of their eyes. They wear small earrings of iron or brass. Their bodies are never washed unless it be by the rain.

They speak Siphalese, but it is so corrupted that it is very difficult to understand. They make use of some words that are not Siphalese. Their voice is loud, harsh, ill-toned, and disagreeable.\*

Polygamy is not practised either on the part of the men or the women. When the females arrive at a proper age, they are asked by the young men from their parents, who never refuse their daughter to the first suitor. No marriage presents are given on either side, nor is there ceremony or marriage feast. The bridegroom merely calls, as they express it, the bride from the hut of her parents to his own.† Their wives are generally prolific, but the great majority of their children die of fever when young. They speak most favourably of the fidelity of their wives, and assert that their caste is distinguished for chastity. They never repudiate their wives, whose duties are purely domestic, except that they assist in reaping the kurakkan. They are kindly treated by their husbands. As to the relative rank

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\* Many of the hill Veddás that I have come across appeared to have lost the power of modulating their voice, probably from disuse.

† The bride ties a string round the bridegroom's waist, and they are man and wife.

of the females, it is asserted that the men have more regard for their wives than for their brothers and sisters.

Strangers who reside in their country for any number of days seldom escape jungle fever, and they are not a little exposed to the baneful effects of the climate themselves. Besides fever they are subject to cutaneous complaints; but it does not appear that either venereal disease or small-pox is known among them. They attribute all sickness to the agency of malignant spirits, with whom they believe their country to abound. The use of medicine of any kind is not practised among them. They trust entirely to incantations to propitiate the demon who has afflicted them. In all cases of severe sickness they devote a silver ring and a piece of cloth, which are deposited in a particular place. After this, the Yakdesa, or demon priest, who is always one of the eldest of their own tribe, is sent for, and he dances and chants certain incantations before the sick persons. He is then fed with what they have to give him, which generally consists of the cakes made of honey and rotten wood, and the ceremony is concluded by his carrying off the ring and cloth offered in sacrifice from the spot where it was laid. They pay no respect to the dead. The body is thrown into the jungle without ceremony, to be devoured by wild beasts.

Of an all-powerful beneficent being they have no idea, but they believe in the existence of a plurality of malignant spirits. Of a future state they have no notion, and are equally ignorant of the religion of Buddha and the gods of Hindu mythology.\*

Their knowledge and moral notions appear to be as limited as their mode of life. They cannot count beyond five, and the stupidity and apathy of some of them is very striking. There is, however, something in their manner, when in their native forests, like the independence or indifference that may

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\* They also believe in the fostering care of the spirits of the dead, whom, with the sun and moon, they constantly invoke in time of need.

be expected in a savage. One of them, on being asked to show how they steal upon their game, gave a most striking specimen of good acting. The keenness and intensity of his eye, the lightness of his step, and the eagerness of desire displayed in every limb and muscle of his body, could only be compared to those of a cat or a tiger stealing upon its prey.

Their whole appearance bespeaks the hardness of their condition. They are lower in stature than the ordinary Siphalese, but are meagre in their bodies and squalid in their looks. Their figures denote that they might be active in their movements, but they give no indication of being possessed of much strength either of body or constitution. Their limbs, however, though thin and slight, are well turned. They are generally of a darker complexion than the common Siphalese, though some are of a much lighter shade than the others. When not in the jungle they carry a white staff about seven or eight feet long, and when they stand, they plant this before them, grasping it with both hands a little above the height of their forehead, and bend forward in a most unmeaning and ungraceful position.

(2) The hill Vēddās are of the same caste and description as the others, their habits and customs are much the same, but they are described as being of a savage and ferocious disposition.\* Persons who approach them are considered to be in danger, and they are said to be at enmity with all their neighbours.† There were certain seasons when the Vēddās had to render a tribute of honey and flesh to Government, but, as the wild Vēddās never entered a town or a village, the Vēddās of Horabora used to repair to a certain place near their haunts, where they found the honey and dried deer's flesh deposited. They, however, seldom saw the people

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\* The hill Vēddās are fast becoming extinct, first, from constant intermarriage between members of the same family, second, from the decrease in the game of the country, and the consequent privation and lack of food.

† N.B.—This was written in 1820.



themselves, and when they did they avoided them as dangerous.

Both the wild and village Vēddás rank with the Vellálas (the highest Sīphalese caste). When the more civilised Vēddás go to the house of a district chief of the Vellála caste, they receive water out of an earthen pot with a spout to it, a privilege that belongs only to the Vellálas.

The men among the wild Vēddás are still more scantily clad than their neighbours, for they wear no cloth, but only a small apron of plaited leaves. The women are scarcely ever to be seen. They remain in the deepest recesses of the wood, or among the rocks in the hill country, and are as naked as the men.

The hill Vēddás speak a language that is not understood either by Sīphalese or Tamil, but some few words of the Sīphalese language are to be recognised in it.\* They hold no intercourse with their more civilised neighbours, and it is, as above stated, considered dangerous to go near the places of their resort. They are quite migratory in their habits and mode of life, remaining but a day or two at a time in one place. They have no huts, but take shelter under large trees or rocks. They have a fire constantly burning, which they produce by the friction of one piece of wood upon another. They live solely on what nature affords them, on roots, fish, and the game they kill with their bows and arrows.† They

\* Notwithstanding all that has been said to the contrary, I believe the Vēddá language to be merely a patois of the ordinary Sīphalese. Many of their words can even now be traced to a Sīphalese origin, such as, for instance:—

To drink—*diya-kanawa*—in Sīphalese, to eat water.

To sleep—*nidenawa*—in Sīphalese, *nidagannawa*.

Snake—*polongo*—in Sīphalese, *polonga*.

Lightning—*gini wetuna*—Sīphalese, fallen fire, &c.

Considering that they have no knowledge of letters, no literature of any sort, nothing to arrest the constant change in their spoken language, it is remarkable that any indication of the affinity of this patois to Sīphalese should have remained.

† The constant change in their residence is due to their search after game.

cultivate no kind of grain, and make nothing but their bows and arrows. The iron heads of the latter and their axes they obtain in the following manner :—They carry a quantity of dried flesh and honey to a place near the residence of a Sinhalese blacksmith, and hang it up on a tree out of the reach of dogs and jackals, together with a leaf cut in the shape of the iron article they want. The smith fails not to accept the offer thus made to him, and in due time hangs up in the same place the article required in return. It is understood were he to fail in doing so, that he would be exposed to the most dreadful vengeance of the Vēddá and his friends.\*

It is the general belief that the hill Vēddás are extremely tenacious of the chastity of their wives. They are consequently apt to be jealous, and instances are not wanting of their sacrificing to their revenge both the wife and the supposed paramour; but all speak in high terms of their kind treatment of their wives, and of the fidelity of the latter to their husbands.

The hill Vēddás living along the frontiers of the Kandyan and Maritime Provinces never acknowledged by tribute either the Dutch, British, or Kandyan Governments; but those towards Horabora in Bintenna paid a tribute of flesh and honey at three different seasons of the year to the royal stores at Kandy. This they of their own accord, at the proper time, hung upon a tree, and it was brought from thence by the Vēddás of Horabora, as has already been noticed. The officer whose duty it was to collect the tribute never had any personal communication with the hill Vēddás, and having no control over them he could not have enforced the payment had it been withheld. There was, however, no known instance of their ever having failed to pay in due time.

They never commit depredations upon the crops or property of any kind belonging to their civilised neighbours,

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\* This custom has fallen into disuse.

nor do they molest traders or travellers on the commonly frequented paths that lead through the country they inhabit. It is dangerous to offend them, and instances are known in the Batticaloa district where they have revenged an injury by deliberate assassination.

In Major Johnstone's expedition from Batticaloa to Kandy, in 1804, the first person that fell was brought down by the arrow of a Veðdá. On the march of the detachment through the Veðdá woods between the Nadakáðu province of the Batticaloa district and the frontier of Wellassa, a small clear spot was chosen to encamp on for the night. It was on the side of a wood which a party of the pioneers entered for the purpose of procuring firewood. It happened that a few Veðdás had here taken up their temporary abode. They fled on being discovered by the pioneers, who at once proceeded to plunder the little property they had left in their huts, the most valuable part of which consisted of two or three fowls, who, like their owners, sought safety in the jungle. While one of the pioneers was pursuing a fowl, a Veðdá concealed in a bush shot him through the loins. This happened but a few yards from the camp. The wounded man was brought in alive, and the arrow was extracted by the medical officer, but he died in a few hours. The Veðdás effected their escape. An instance of their mode of taking revenge took place in the Batticaloa district about 1822. One of the more civilised Veðdás, a lad who had established a friendly intercourse with a hill family, conceiving an attachment to a young female of the family, made proposal to the parents for her. The match for some cause or other did not come off, and shortly after the girl sickened and died. The family attributed her death to necromancy practised by the young man, and under this impression, four or five years after, a brother of the young woman left the woods in search of the object of his revenge, and having found him watching a paddy field in the Batticaloa district, walked up to him in the open day, and deliberately shot him through the body.

This was done in sight of another man, a Malabar, who was in the same field at some distance, and from whom the Vēddá had ascertained the identity of the man he was in search of. The assassin, after withdrawing the fatal shaft from the body of his victim, made his escape into the woods.

They are not only ready thus to redress their own grievances, but also those of their friends; and this disposition was sometimes taken advantage of by the Moormen and Malabars, who were in the habit of intervening between those who are in a sort of semi-civilised state, and the absolutely unsocial and uncivilised Vēddás. An instance of this also took place in the Batticaloa district, about the same time. A headman of the Province of Pattipal having rendered himself obnoxious to the chena cultivators near the Vēddá country, a party of Vēddás came down quietly in the night to the village where the headman was residing at the time, surrounded his house, plundered it, and put him to death. In short, the disposition of the hill Vēddás was so well known that the Sinhalese, Malabar, and Moor families, from whom the petty chiefs placed over the partly civilised tribe were generally taken, both in the interior and the Batticaloa district, were objects of dread amongst their neighbours from the influence they possessed over such ready instruments of revenge.

In regard to their origin, it is remarkable that the traditional accounts of them given by the best informed Kandyan chiefs, and the most intelligent Tamil inhabitants of the Batticaloa district, perfectly accord with each other.\*

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\* The historical origin of the Vēddás is as follows:—When Wijayo landed in Ceylon, he married Kuwena, the daughter of a Yakko chief. She betrayed her people into his hands, but when she had served his purpose he deserted her. She returned to her people, but they were so incensed with her that they put her to death; and her two children by Wijayo only escaped the same fate by the intervention of their uncle, who fled with them into the forest near Adam's Peak. Some time after the brother and sister married, and founded a wild race, who kept aloof from all their neighbours, retreated into the forests of Wellasa and Batticaloa on the approach of the Indian invaders, and became "the wild men" of Knox—the Vēddás (or hunters) of Ceylon.

The Kandians say that the Veḍdás are real Sinhalese Vellálas, who at a period of very remote antiquity occupied the tract of country which now constitutes the district of Batticaloa. That they were expelled from thence by an invasion of Tamils from a foreign country, and took refuge in the forests in which they are now met with. They would not mix with the other inhabitants of the country, but to criminals and other unprotected fugitives who took refuge amongst them, and to slaves who fled from their masters, they generally afforded hospitality and protection, though they were apt to deliver them up for presents in cloth, &c.

They are totally unacquainted with letters, but the different tribes hold a rude correspondence with each other by small pieces of wood cut into different shapes. Fugitives used to be furnished with passports of this kind, when they removed from one tribe to another, and the treatment they received depended on the recommendation which the talisman conveyed.

Man in a state of nature, or in any degree approaching it, is ever an object of curiosity to the civilised world. The knowledge of the existence of the Veḍdás of Ceylon must therefore excite a wish to be acquainted with their origin and history. From themselves, however, no information whatever can be obtained. They trouble themselves little about futurity, and the past is a blank to them. They are said to have been in the habit of addressing the King of Kandy by a word which signified "brother"; but this was merely due to the poverty of their vocabulary, as the word *aluwa*\* is used by them when speaking of or to all persons with whom they are in friendship, and in consideration of this they were allowed to use this familiar term in the presence of the late king, a liberty that would have cost any other of his subjects their lives.

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\* Bailey, who, by the way, says that the word is "hoon" (cousin), attributes this familiarity to the fact that the Veḍdás claimed and were acknowledged to have a royal origin.

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