A practical memoir on the history and treatment of the diseases of the camel, with instructions for preserving its efficiency... outline of its anatomy, also, an account of the medicines used...

A PRACTICAL MEMOIR

ON THE

History and Treatment of the Diseases

OF

THE ELEPHANT,

WITH INSTRUCTIONS FOR PRESERVING ITS EFFICIENCY AS AN ANIMAL OF TRANSPORT

AND

A GENERAL OUTLINE

OF ITS ANATOMY,

ALSO,

AN ACCOUNT OF THE MEDICINES

USED IN THE CURE OF ITS DISEASES,

DRAWN UP

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CALCUTTA:

G. H. HUTTMANN, BENGAL MILITARY ORPHAN PRESS.

1841.

PREFATORY REMARKS.

The object of this Memoir is to communicate the result of my researches into the History and Treatment of the Diseases of the Elephant, and to convey such other information, which has come into my possession during my enquiries as will, it is hoped, prove useful in preserving the efficiency of that useful animal.

The design of the Memoir being purely practical, all questions relating to the animal not connected with its efficiency in regard to the use made of it in the Public Service, however interesting in themselves, are carefully excluded. Considered only in regard to being employed in the Public Service as a means of transport, &c. such concise instructions are given for the preservation of its efficiency and the treatment of its diseases as well, admit of easy reference, and convey the desired information. During peace when time and facilities exist to recruit this Department of the Public Cattle as occasions arise, the individual value of the animal is, to an extensive Government like that of British India, of little comparative amount. But opposite conditions exist in regard to its value during the progress of Military operations when circumstances render difficult fresh reinforcement to meet the decreasing number, of efficiency, in those employed. The preservation of the efficiency of individual animals, during active service, more especially when employed beyond the Frontier, being an object of paramount importance, I have steadily kept in view while drawing up this Memoir, the communicating whatever had occurred to me as likely to prove conducive to that important end, so that those in whose hands is entrusted the superintending charge of the Public Cattle, will, it is hoped, find in it information which will assist them in the discharge of their important duties connected with the subject herein discussed.

The facts communicated are arranged under four heads, viz.

1st.—*The History and Treatment of the Diseases of the Elephant.*

2*d*.—*Instructions of a prophylectic kind, or referring to the preserving of the efficiency of the animal while in health.*

3*d*.—*The Materia Medica, or a summary view of the virtues and doses of the Medicines, and a Statement of several curative measures employed in the cure of Diseases of the Elephant.*

4*th*.—*A general view of the Anatomy of the Animal.*

PART 1ST.

THE HISTORY AND TREATMENT OF THE DISEASES OF THE ELEPHANT.

THE theory of the Cattle attendants regarding disease has at least the recommendation of simplicity. They consider all diseases to arise either from a superabundance of heat in the animal's system, or from a deficiency of temperature—accordingly in the treatment of disease, the practice of the Mahouts is directed to one of two objects, either to restore heat or withdraw it. Depressed temperature, however, is considered by far the most fruitful source of disease, and accordingly what are considered to be the stimulating medicines are much more frequently exhibited than those of the opposite character. It is fortunate, however, that their theory and their practice do not always harmonize, otherwise their interference would, in many instances, be attended with much mischief. Thus they consider inflammation of the brain "Bhao ka murz"—see page 9—a disease to arise from cold, and accordingly give what they consider heating medicines, which indeed they, as we will afterwards see, are not.

In severe ailments, as all those of the inflammatory class, the native practice may be said to be always inert, and in some instances hurtful. They have no idea of the powerfully curative effects of bleeding or purgation in inflammatory disease, indeed frequently in such cases they employ stimulants, so their advice in this class of diseases is to be for the most part discarded. But an opposite estimate is to be taken of their treatment of chronic disease, particularly of the digestive organs, here their Mussallas appear in many cases to be useful. Accordingly in the 2d Part of this Memoir will be found sundry receipts for the preparation of Mussallas for the latter class of diseases, and I have thought it will be attended with benefit, also to make known what is frequently prescribed in other diseases, as well to convey an idea of native practice, as to guard those who have the superintendence of Public Cattle from trusting, in inflammatory diseases, to preparations, which the Cattle attendants will pronounce almost infallible.

These receipts are given in the 2d Part, not to interfere with convenience of reference to the subject discussed in this one. There is a term in frequent use amongst the Cattle attendants, more especially, however, amongst the attendants of the horned Cattle and Camels than amongst those of the Elephant, which it is advisable here to explain. The term alluded to, is

Bhao. In its general acceptation, this word is of very vague import, meaning no more than sickness; the Mahouts, however, use it in a much more definite sense restricting its application, with one exception, to diseases of the brain or of the lungs, as explained at page 9.

FEVER.

History.—This ailment is marked by heat of surface, cold ears; the pulse, (see page 64 for information regarding the pulse,) which is to be felt behind the ears, about 70 or 80 in a minute. It generally commences with rigours and restlessness. When the hot stage supervenes, the animal is very desirous to throw water over its body by means of its trunk; there is much thirst, the urine, by the appearance of which, in regard to colour and quantity, the Mahouts infer the degree of fever, is either reddish and scanty, indicative of a severe attack, or of a whitish and muddy appearance, which characterizes the milder form.

It is rare that fever exists uncomplicated with local ailment; when it does, it usually arises from a sudden change of temperature of body as when heated, suddenly being chilled by fording a river, being washed after coming off a march before time has been allowed to cool, &c.

Treatment.—In its milder degree fever may abate of itself, or be removed by free purgation. But in aggravated cases marked by much restlessness, fiery eye, attempts to get loose, in short madness, bleeding must be resorted to; instructions for performing which will be found at page 65; bleed to 1 or 1½ gallon, and repeat if the symptoms have not considerably abated Give six ounces of aloes along with some rice made up in the form in which the "ratib" is given; or if the animal refuse to take this medicine, which is sometimes the case, give it four or six drachms of croton oil seeds mixed with some rice, in the manner just alluded to. The ratib or allowance of rice, ought to be stopped in the severe cases, and if a choice of fodder can be commanded, grass is to be preferred to branches of either of the trees usually given, the former being less stimulating.

ZAARBAHD.

History.—This disease commences with febrile symptoms, but usually these are unobserved, and the ailment of the animal is not brought to notice by the Mahout till the characteristic and prominent symptom of the disease is developed, namely, swelling of the parotid glands. These glands which secrete the saliva, are situated on either side of the neck, behind the lower part of the ears, and in health, do not project beyond the general contour of

the surface, but when under the influence of this affection they are very prominent. The parts situate lower down on the neck next swell, and the skin over them becomes tense, then the swelling occupies the lower part of the neck and stretching between the forelegs finally occupied the whole of the lower part of the abdomen. The swelling is caused by fluid secreted into the cellular tissue, and when it appears on the abdomen, which is usually two or three days after the parotid glands have been swollen, these usually diminish in size, but still continuing distinctly swollen.

The swelling below the abdomen sometimes becomes very large, adding more than a foot to the depth of the body of the animal—when punctured a considerable quantity of watery fluid oozes out.

Occasionally the Zaarbahd observes a slow and gradual course, and the first indication of this variety is the appearance of blind boils about the abdomen, which do not suppurate. "*Nungee*" is the name given to this blind boil indicative of Zaarbahd.

Boils which suppurate are not indicative of the disease now under consideration, such boils are called *Russoolie*, vide page 20.

Zaarbahd sometimes runs its course to a fatal termination in 36 or 48 hours ; usually, however, it is more protracted and may terminate fatally after 3 months continuance. In these protracted cases the swellings above described, may alternately enlarge and decrease, the animal gradually losing flesh, though continuing to the last to eat fodder. This is at all times a dangerous disease, a large majority of cases proving fatal. I am informed paralysis of the hinder extremities sometimes occurs before death. During the Military operations in Goomsur, Northern Circars, during 1837 and 1838, eight Elephants with the Force died of this disease. During the Mahratta war, it also proved very destructive to the Elephant.

I have seen two cases of this disease ; they both came under treatment several days after the commencement of the disease ; during which time no treatment had been resorted to ; they both died. On inspection of the carcase's appearances much the same in both were discovered, namely, a morbid accumulation of fluid within the spinal canal, and coagula of lymph occupying a considerable portion of the diameter of the large blood vessels near the heart and also in the carotid arteries.

The one died two months after coming under treatment, but about the middle of that period it had so far recovered that it was considered exercise would be beneficial; it had been at Goomsur, but left healthy—the other died

about six weeks subsequently to coming under treatment. It was received from Coimbatoor, in the jungles of which district it had been caught.

With the exception of the swelling of the parotid glands this disease resembles very much in its symptoms, and the appearances shewn by dissection, the acute form of the disease to which in the Northern Circars, the human subject is obnoxious, known by the name of *Beriberi*, and it is a singular fact that many of the Horses belonging to the Officers of the Goomsur Force died from a disease of nearly parallel symptoms.

The disease appears to be an affection of the spinal canal, and to consist in an accumulation of fluid therein, more or less rapidly, and variously situated as to place of spine. When the accumulation occurs near the head, the progress of the disease to a fatal termination is rapid; but when the fluid is originally situate near the haunch and thence spreads upwards, the disease is less speedy in its progress and more within the range of treatment.

Treatment.—Bleeding in this disease is of unquestionable utility. The progress of the disease to a fatal termination in one of the cases in which it was largely practised was decidedly impeded thereby—marked mitigation of the symptoms followed each recourse to it, and had the animal come under treatment soon after the commencement of the disease, good grounds exist for the supposition that a cure would have resulted. Free purgation ought also to be practised. Give aloes either alone or in combination with croton oil seeds.

Aloes,.....	4 to 6 drachms.
Croton Seeds, ...	2 to 4 drachms.

or an ounce of croton seeds alone may be given and repeated the following day, if the animal refuse to take aloes : see under the head Purgative Medicines, page 38, for instructions regarding the exhibition of Purgative Medicines.

The animal ought to be well fomented along its spine, for performing which operation instruction will be found in page 35. Three alterative doses of calomel are to be given, half a drachm or a drachm daily,—the first two or three doses being of the latter quantity.

The swelling below the abdomen, when very large, may be advantageously punctured in several places, when a large quantity of fluid will ooze out ; five gallons have thus been drawn off in 12 hours.

In Part 3d, page 38, will be found some receipts for Mussallas the Natives are in the habit of giving in this affection, but they are, as a primary measure, of no efficiency, but may be conjoined with bleeding, &c. as above recommended. The ratib ought to be stopped during this disease.

This disease is particularly worthy the attention of those who, during a Campaign, are entrusted with the superintendence of the Public Cattle. Early recourse to bleeding may restore Elephants speedily to health, while neglect may deprive the Force of their invaluable services, and it is the more worthy of attention since the disease, whether endemic or epidemic, may attack several at one and the same time.

BHAO-KA-MURZ—DHAAG-KA-MURZ—PEEPSA-KA-MURZ.

History.—These three terms are given to the most dangerous ailments to which the Elephant is subject. The seat of one is the brain, of the other the lungs; and the Mahouts use these names in common for both diseases as they consider that only one disease is involved. At present we will consider the affection of the brain, that of the lungs is treated of at page 14.

In regard to the head the above terms imply. 1st. Inflammation of the brain, or of its membranes. 2d. Inflammation of the membrane lining the cavity of the cells, which separate the inner table of the cranium from the exterior. 3d. It is also expressive of apoplexy. The first of these affections, viz. inflammation of the brain, or of its membranes, is marked by furious delirium. The animal is extremely restless, tries to escape and to attack its keeper, frequently lies down and rises, but this latter motion soon comes to an end, the animal through weakness being no longer able to rise: a highly characteristic symptom of his disease is the trunk becoming much shorter, sometimes to half its former length; an attack of apoplexy is marked with the restlessness just described, but not with furious delirium—it is also attended occasionally with difficult respiration.

When the inflammation is situate in the membrane lining the air cells, it usually is preceded with inflammation and sloughing of the skin over the forehead, though it may arise principally in that membrane.

The causes of these affections are not always apparent though they appear to be connected with over feeding and exposure to an ardent sun—a careless and irascible Mahout may injure the head of his Elephant to the extent of endangering inflammation of the cellular membrane by goading the animal on the forehead with his ankuss. Behind the ear is the proper place for the application of this instrument. Of the above affections the apoplexy is the most speedily fatal, the animal usually dying within an hour after the attack, although up to the moment of the development of the complaint, it

appears in good health. It is so far fortunate that this apoplexy does not attack the animal when actively employed, but only after having been a time without work, consequently is not likely to prove mischievous during the movements of a force. But the other affections may show themselves on these occasions, and then would appear to result from over exposure to the sun. It may result from the continued exhibiting of stimulating Mussallas given with the view to support the strength of the animal during arduous labour—possibly over-exertion may also be a cause.

TREATMENT.—The only chance of saving the animal in inflammation of the brain or apoplexy consists in copious bleeding, and the same practice must prove highly serviceable when the inflammation of the lining membrane of the cells above alluded to, or of the skin over the forehead exists. Bleeding ought to be carried to the extent of 15 or 20 lbs. (one and a half or two gallons,) and repeated if need be: see page 65, for instructions for bleeding. Fomentations to the haunches and abdomen will assist in drawing off blood from the head, vide page 35, for instructions regarding fomentations.

When inflammation of skin over the forehead is the disease to be treated, bleeding is to be practised if the affection be extensive, and hot fomentations applied to the head will prove useful. An aperient may be given. When sloughing has occurred, the ulcerated surface is to be washed with a detergent as camphorated oil; great care is to be taken to prevent flies from depositing eggs of maggots which they are particularly apt to do if allowed access to sores wheresoever situated; at page 40 will be found receipts for the Mussallas, the natives are in the habit of giving in this affection; confidence is not to be placed in their powers as primary curative agents, but they may be resorted to after the above measures have been practised.

That the sun can exert an injurious effect on the Elephant, when exposed thereto, is beyond all doubt. The disease *Ageen Bhao* subsequently to be noticed, also *opacity* of the cornea or transparent part of the eye ball, are direct results of such exposure. Again the animal gives evident manifestations of annoyance from heat, by throwing grass, or whatever in the shape of fodder is given it, on its head and back during hot weather. This act of the animal strongly indicates the propriety of defending its head with a covering of white color, and of an inch or two of thickness (as a padding of wool or cotton,) when the exigencies of a Force require the services of the animal during the heat of the day.

AGEEN BHAO.

HISTORY.—This disease is an eruption of the skin, sometimes amounting to ulceration. The usual cause of it is exposure to a hot sun, though it occa-

sionally arises from a full habit of body or disorders of the digestive organs. The eruption is frequently and usually situated on head, or ears, and haunches, those parts in short most exposed to the sun. It is not a dangerous ailment and will not incapacitate the animal for duty though in proportion to its extent it will more or less impair the efficiency of the animal.

TREATMENT.—The eruption ought to be lubricated with oil, and an aperient given ; see page 40 for Mussallas.

INFLAMMATION OF THE CONJUNCTIVA OR EXTERNAL MEMBRANE OF THE EYE, AND OPACITY OF THE CORNEA.

HISTORY.—The former of these affections is characterized by a weeping or flow of water from the eyes and redness of the ball. It is a common effect of continued exposure to the sun and usually subsides without the aid of art; but occasionally it is so severe in degree as to leave a dimness or even an opacity of the cornea or transparent front part of the eye ball. This opacity may occasion total blindness or only impaired vision according to its extent.

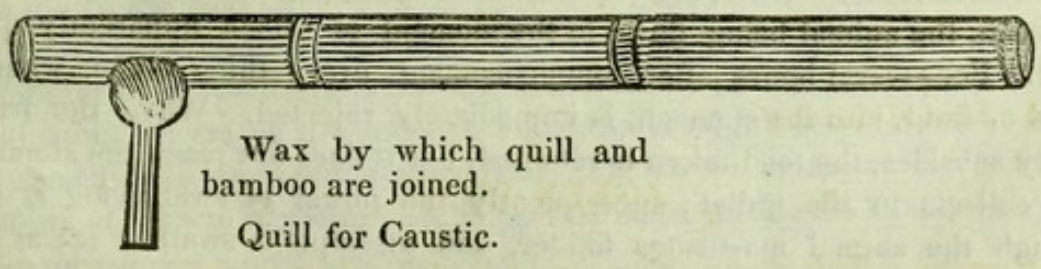
TREATMENT.—The treatment during the inflammatory stage, consists in injecting the following between the eye ball and eyelids.

Lunar Caustic five grains.

Water fluid one ounce, dissolve.

This may be injected twice daily at the commencement, subsequently when the affection has abated, it may be used only once daily, then on alternate days. When *opacity* of cornea has occurred, the opaque part which is white coloured, ought to be touched with a piece of solid lunar caustic, or a grain of this may be powdered and blown into the eye by placing it in a piece of quill which may be, by means of a piece of wax, attached at right angles to a small bamboo about a foot or so long as represented below.

BAMBOO.



At page 46 are given some native receipts, which may be used with advantage.

HINDEREE-KA-MURZ.

History.—This is an affection of the wing of the ear, from which, if neglected, half of it may drop off piece-meal. It commences with a blister, which afterwards ulcerates and eventually sloughs off. It is occasioned in common with the former two affections by continued exposure to an ardent sun.

This is obviously a superficial sore from external causes, and consequently the common treatment of keeping the ulcers clean and applying some gentle stimulant, as camphorated oil, will effect a cure.

The native application is the juice of the Banyan tree.—another is the ripe or yellow branches of the common milk hedge, burnt to ashes, and these are mixed with Jingili oil.

TEETH.

About 80 years of age, the front portion of the teeth called by the Mahouts, eye teeth, on either side of the lower jaw, fall out from age. The teeth are subject to no disease.

NECK.

The neck is the seat of no affection, with the exception of the swelling of the parotid glands which occurs only in Zaarbahd, which affection has already been considered.

DAAK-KA-MURZ.

Vomiting.

History.—This disease supervenes suddenly with great irritability of stomach, the animal being down to the moment of attack apparently quite well. For several hours after commencement, every thing taken, whether solid or fluid, into the stomach, is immediately rejected. When the irritability subsides, the food taken is retained, but it does not reach the stomach, but collects in the gullet; subsequently the power of swallowing is lost, though the animal masticates fodder, and attempts to swallow it; at this stage of the disease a hard swelling is to be felt in the neck occasioned by the gullet at this part (as also is the case throughout its whole extent) being

impacted with masticated food. The animal shews evident symptoms of much distress, but never becomes delirious. If not relieved after a variable period varying from two to four days, the animal dies, having previously been deadly cold over the whole surface for several hours.

Dissection will shew the gullet mortified in several places and to be impacted throughout from pharynx to diaphragm with solid masticated food. In one case, so considerable was this impaction, that when a portion of the more healthy part of the gullet was laid open, the edges of the incision retracted upwards of two inches. In two cases of this affection which came under my notice none of the other organs of either carcase shewed any appearance of previously existing disease, so it is clear that this impaction of the gullet, or rather the consequent mortification, was the cause of death.

After the irritability of the stomach subsides, it would appear that spasmodic action of the diaphragm supervened, obstructing the permeability of that portion of the gullet which passes through it, that impaction of the food then commenced and continued until the muscular power of the œsophagus became paralyzed, when inflammation, and finally mortification, followed. According to the experience of the Mahouts this disease almost uniformly proves fatal, it may show itself equally during any portion of the year. The animal is liable to be seized with it if washed immediately after coming off a journey when he is heated.

Treatment.—When this disease supervenes no time should be lost in bleeding the animal freely. It ought then to be well fomented over the trunk ; vide page 35 for instructions regarding fomentations. This practice is based on the well established powers of depletion over spasmodic affections, of which the present doubtless is one, at least at the commencement.

2d. The animal ought most rigorously to be prevented eating any solid food, until every symptom or tendency of vomiting has disappeared. The benefit of withholding solid food under the circumstances just mentioned arises from this, that spasm from the lower part of the gullet exists, which prevents the passage of food into the stomach, consequently when the animal swallows, the food swallowed becomes impacted in the gullet throughout its whole extent ; palsy of this organ arises from over distension. It inflames and mortifies, and death doubtless is the result of the latter process. The adjusting powers of the animal's constitution might overcome the primary spasmodic disorder, but are evidently unable to overcome the paralysing effects of the stuffing of the gullet, and by consequence are unable to ward off the subsequent mortal process.

The exigencies of a Force in movement are very likely to require occasional forced exertions from the Public Cattle. The disease now under consideration is liable to arise under such circumstances, when after coming heated off a stage it is anxious to cool itself in water, and the Mahouts wishing to get their work over quickly may commence the operation of washing before the animal is sufficiently cooled. The sudden change of temperature thence resulting is peculiarly efficient in causing this affection, and thus the Force may be speedily deprived of the services of an useful animal. It cannot be too urgently recommended, to prevent the animal eating solid food after the supervention of this disease, for the reasons above given, for after the impaction of the gullet has occurred nothing effectual can be done to save the animal.

PEEPSA-KA-MURZ.

Disease of the Lungs.

History.—The lungs of the Elephant are subject to inflammation, to suppuration, and to sanguineous engorgement. But of the class of disease the Mahouts have not clear ideas, and apply to it, in common with the above name of *Peepsa-ka-murz*, which is definitely expressive of disease of the lungs, the two other terms of *Bhao-ka-murz* and *Dhaag-ka-murz*. But these last two terms are used only in reference to the rapidly fatal variety of pulmonary disease, namely, the sanguineous engorgement, which is so far similar to the apopletic variety of *Bhao-ka-murz* already alluded to above under that head, vide page 9, that in both, death results from a proternal or abnormal collection of blood respectively in the head or in the chest, whereby the function of the containing organs is fatally overcome. But inflammation attacks the lungs and has some characteristic symptoms, and it is the variety of the diseases of this organ, I have in view under the present head. Inflammation of the lungs is a dangerous disease, if not speedily and actively attacked. The animal becomes very restless, but does not lie down ; it opens its mouth wide frequently, and several times in an hour, coughs. As the disease advances, the animal endeavours to escape, but does not become furiously delirious. The surface throughout is very cold, the bowels are costive, but the urine is free. The opening of the mouth under the circumstances above named, is a good distinguishing sign of the disease ; the same symptom is present during the disease of the abdominal organs presently to be described under the head Pet-ka-durrud, page 16 ; but in this latter disease, the animal frequently rise up and lies down and crosses its hind legs, shewing evident signs of great pain, but these symptoms are absent in the disease now under consideration. It is to be observed, however, that this symptom is not always present, but is confined to the most severe varieties of the affection and an inflammation of the

lungs may exist, which though less intense in degree, and unmarked by any prominent symptom may continue a variable period, and eventually cause death if allowed to run its course, undisturbed. It is only by frequent inquiry into the state of the animal's health, that obscure diseases are to be detected, as any change from the known healthy standard, will thereby arouse attention and suggest observation.

Treatment.—The treatment of this disease must be active and speedy—and like all inflammatory diseases of important organs requires active depletion. Bleeding to a full quantity is to be practised,—vide page 65, for instructions for bleeding. Fomentations, (vide page 35,) are to be assiduously applied to trunk of body, and an aperient of aloes and croton seeds, or croton seeds alone, (vide page 36 for the doses,) is to be administered conjoined with one or two drachms of tartar emetic. This latter medicine may be continued in drachm doses, every second hour—next morning two drachms of calomel may be given, and if need be, the aperient repeated. The after treatment consists in repeating the bleeding and in continuing the fomentations and tartar emetic, with the occasional exhibition of an aperient and of calomel in a drachm dose every other morning.

The above history and treatment refer to the pure and severe inflammatory variety of pulmonary disease, as already intimated—however, there are other varieties of less prominent feature, but nevertheless of very fatal effect. When pulmonary disease occurs in the Elephant in an epidemic shape, the variety of the disease now under consideration would appear to be the one that obtains. I have not myself seen this affection, but I have much satisfaction in inserting here an account of it as it showed itself in the Tenasserim Coast in the year 1839, and when it proved extensively fatal to the Elephants, as well public as private of that province. The account of this epidemic is the production of Dr. Macdonald, a zealous Officer, on the Madras Establishment, who communicated it to the Medical Board in a topographical description of the Tenasserim Provinces, of which he was Staff Surgeon, and I am indebted for it to the consideration of the Madras Medical Board who ordered it to be forwarded to me, being connected with my duties, as far as regards the investigation of the diseases of public Cattle. With reference to Dr. Macdonald's account he says—" In this year of 1839 extensive mortality prevailed among " the Government Elephants—it began to shew itself at Moulmein, after the " mortality ceased among the Bullocks sometime in June. Previous to this " Elephants throughout the provinces died in immense numbers—post mortem " examinations were made of many of these cases, and save in two instances, " when death appeared to be the result of peritonitis, in one of which, rupture " into the abdominal cavity had taken place, all died of disease of the lungs in " various stages of congestion and inflammation—in one case suppuration was

" present—in another, tuberculous deposits: generally one side of the chest " was only affected, the other lung pretty healthy—among those who died in " the first outbreak of the disease, the lungs were absolutely black through- " out, their whole substance more like the spleen, save in its tough membranous " intersections, than the lungs. This was so general that in our first examina- " tion it was a matter of doubt what was health, and what was disease, but " in progress it was ascertained that the healthy lung is of a pale fleshy elastic " firm substance, while the diseased structure showed every shade from " the florid appearance of active inflammation, to the black apoplectic " congestion,—this latter when cut into, giving forth a frothy purulent " exudation."

The animals attacked with this epidemic, Dr. M. further states, "continue " to do work till the hour of their death." It gives me much satisfaction to add that the practice this gentleman found beneficial, is confirmatory of the utility of my own as above given. He also suggests the benefit of attaching to a depot where Elephants are kept, an intelligent subordinate, with the express object to ascertain by daily inspection in the manner I have above recommended, the state of the health of these useful animals: of the great advantage of such a measure, more especially in regard to the Cattle attending a Force in the field, there can be but one opinion.

THE HEART.

No disease of this organ has come under my notice, with the exception of its valves being clogged with coagulated lymph, but this arose from other causes than disease of the organ itself—such a condition of the valves arises from Zaarbahd.

DISEASES OF THE ABDOMINAL ORGANS.

Pet-ka-Durrud.

History.—This disease is known to exist by the following symptoms. The animal leaves off feeding, is very restless, very frequently engaged in alternate lying down and rising up, moves from side to side, opens the mouth more or less frequently, and keeps it open a minute or so, crosses legs frequently and frequently strikes sides with tail, and otherwise evinces much distress.

The bowels are confined. The surface is more or less below healthy temperature. It may arise from sudden depression of temperature of surface, and is always more or less connected with the existence of worms in the ali-

mentary canal or bowels. This disease is a spasmodic affection of the bowels, and if neglected may occasion inflammation of those organs, which inflammation may prove fatal.

TREATMENT.—This disease is relieved by anti-spasmodics.

Opium, ... 1 to three tolahs,
Assafœtida, ... three tolahs.
Ginger, ... two tolahs.

Mix with jaggery into a mass and give, repeat an hour afterwards if need be; next open the bowels freely with aloes and croton seeds, or the latter alone: vide page 36 for dose. In addition to giving this internally the animal may be well fomented. The medicines given by the natives are enumerated in page 43.

The medicines now recommended above will be found more efficacious.

If inflammation of the bowels have occurred, shewn by slime in stools, 10 or 15 lbs. of blood will be drawn with advantage, but a small quantity of slime will not require recourse to this operation, as fomentation, which ought to be practised in the severer cases also, will prove sufficient to effect a cure in the milder varieties. It is not an uncommon appearance during hot weather, more especially when during that season, the animal is worked much. It also results from the continued use of the peepul tree for fodder.

In all such cases regard will be had to the relative quantity of the slime passed, and to the amount of febrile disturbance indicated by pulse, in determining whether the active treatment of bleeding is required, or the milder one of fomentation alone.

DYSENTERY.

I have never seen a case of this affection, meaning thereby the passing of mucus with blood, in the Elephant, and am told that the animal is exempt from such a malady.

WIEGOLLAH.

FLATULENCY, WITH IMPAIRED FUNCTION OF BOWELS.

HISTORY.—In this affection there is much rumbling noise in abdomen (which is the characteristic symptom.) The evacuations are not formed, but at

the same time are not watery. It is a chronic affection and arises from loss of tone of the alimentary canal, whereby it discharges its function only imperfectly. The animal consequently becomes weak and loses flesh, and if the disease be neglected it may eventually prove fatal. Under ordinary care, however, this is an easily curable affection though somewhat protracted.

Treatment.—The treatment consists in restoring the tone of the bowels, and this is done by tonics and stimulants.

Ginger,.....	4 ounces.
Assafœtida, ...	1 ounce.
Sweet flag, ...	2 ounces.
Margosa bark,.....	8 ounces.
Sulphuret of Antimony, ...	2 drachms.

To be given twice daily for a week—a scruple of calomel may be given daily for four days, afterwards on alternate days. The Native remedies which will be found at page 44 are very useful, and may be confided in, in all ordinary and in uncomplicated cases of this affection.

LUNGUN.

History.—This disease consists of a purging during which worms in variable number are passed. The worms that infest the alimentary canal of the Elephant are of two kinds, the one a worm about 2 or at most 3 inches in length and about a line in diameter, semi-transparent and of whitish color, the other is a flat circular worm, if the term may be used in reference to it, about the diameter of a silver two-anna piece and of a reddish fleshy color, the former is called *Shotee*, the latter *Mussoorie*, by the Mahouts. The Elephant's bowel is rarely, if ever, free of the Shootee, and unless present in very great number they do not appear to be prejudicial—on the other hand, the Mussoorie causes much irritation and induces the animal to resort to a measure which instinct has pointed out, to give relief from the irritability thence resulting, and in accordance with the suggestion of instinct this measure is perfectly successful. The measure referred to is the eating of a variable quantity of earth (about 10 or 12 seers.) Usually after the expiration of 12 hours the effect of the taking of this earth shews itself in copious purgation ; after the purgation has commenced the animal leaves off taking more earth. The alimentary canal is effectually scoured of the worms. The Mussallas given by the Natives in Lungun is the same as for Pet-ka-durrud, see page 43.

During the continuance of the Lungun the ratib ought to be withheld, according to the Mahout's opinions, who consider the giving of rice when the

animal is taking mud, is dangerous. I have however seen no bad effects from its use during the continuance of the malady. The disease is called Lungun, or fasting, because the animal is thus deprived of its ratib, Lungun or Tungamun being a Canarese term, signifying fasting, or going without food, from necessity.

Treatment.—Allow the animal to use the *earth* with the view to scour out the worms present. Afterwards a course of tonics with carminatives will prove useful in restoring the tone of bowel.

Sulphuret of Antimony, ...	half ounce.
Sweet flag, ...	quarter pound.
Assafœtida, ...	one ounce.
Ginger, ...	two ounce.
Bark of the Margosa tree, dried and powdered,	half a pound.

Mix. To be given with the ratib once daily—half a drachm of calomel may be given daily for five or six days : see page 36, for remarks regarding the exhibition of earth and of the supposed mode of action.

GURMEE-KA-ZORE

Is a phrase expressive of bloody urine, which occasionally shews itself, though very rarely, and I am told is a fatal malady. I have never seen a case of it, so have nothing from personal experience to advance on the subject.

LAAGAR OR DHOOBLA,

OR FALLING OUT OF CONDITION.

This arises from disorder of the digestive organs, more particularly the alimentary canal, and consists in loss of strength and flesh. A course of tonics with alteratives, as recommended under the head Wiegollah, which is dependent on similar derangement, though in greater degree will constitute the appropriate treatment.

SURDEE, BAIE, RHEUMATIC STIFFNESS AND PAINS.

History.—This is a very common affection of the muscular parts and joints of the Elephant, and is frequently the result of carelessness on the part of the Mahout in exposing his animal to sudden depression of temperature,

as taking to water when in a heated state. It usually supervenes immediately after coming off a journey when the animal has been thus carelessly dealt with. It is more prevalent in cold weather than during hot: as to degree it is variable, from slight lameness to complete inefficiency. The part most frequently affected by rheumatism is the shoulder.

Treatment.—Fomentations in the manner directed at page 35, are of singular use in this affection, and the application of a liniment of turpentine and blistering ointment, well rubbed in over the affected part, alone, or conjoined with a purgative, will prove sufficient in the milder attacks. In those however of severe degree, and of greater superficial extent, where lameness to the degree of incapacitating for duty exists, these measures ought to be conjoined with blood letting. The Mussallas given by the Natives for the affection are similar to those given in Bhao-ka-murz. They are of little use in this ailment.

RUSSOOLIE OR BOILS.

History.—The Elephant occasionally suffers from boils, confined to no particular part though most usually situated on the face and thighs. They appear to arise from internal derangement of the digestive organs, and most probably the liver. They are either blind boils, i. e. such as do not proceed to suppuration, but disappear without advancing to suppuration after a variable time either without treatment or by the assistance of a purgative with a $\frac{1}{4}$ or $\frac{1}{2}$ an ounce of calomel by way of correction of biliary derangement. The blind boils differ from the mungee or tumour indicative of Zaarbahd, in size, number and situation. Others, however, are of a suppurative character and by no treatment can be prevented going on to termination in the suppurative process. This latter variety of boils require care and management, for if not properly treated they may occasion so much mischief as to consume several months for treatment, during which time the animal is nearly or totally incapacitated for service.

The important point to be attended to in the treatment of suppurative boils, consists in early giving exit to the matter or pus secreted during the progress of the affection. Prior to its formation, however, fomentation ought to be practised, as this will ameliorate the intensity of the previous inflammation, and when the suppurative process is established, will also prove useful; amongst other advantages it softens the swelling of the tumour and admits the more easily of the presence of pus being ascertained. This point being determined no time ought to be lost in making a free incision to give exit to the pus. If this be not done early, the thickness of the skin, preventing speedy access to the surface, and the pus continuing to be secreted but

having no external passage for escape, the secreted fluid burrows below the skin separating it from its healthy connexion, whereby an abscess, more or less extensive is eventually formed, the healing of which may be the work of months.

Treatment.—The boils therefore, of the suppurative kind, now under consideration, are first to be well fomented to expedite the suppurative process and to ameliorate the inflammatory; when matter is formed make a free incision to give it exit, after which dress the abscess with camphorated oil or with a solution of blue stone, or with turpentine or other detergent substance. Under this treatment the parts will soon be healed and an extensive abscess be prevented forming, which if allowed to form, will take months to cure. It may be advisable to make a few more cautionary remarks on this important point of early opening abscesses occasioned by boils or otherwise.

The Natives resort to this practice, but not till much of the mischief above alluded to, as arising from delay, has been done. The Mahout in all probability will raise objections to the opening of the boil on the ground of its not being ready or ripe, in other words suppuration not having in his estimation taken place, and he will defend the correctness of his assertion on the circumstance of the boil or tumour feeling *hard*. But his advice is not to be acted on from the simple fact that a hard immovable swelling, the contour of which rises more or less abruptly above the general surface of the body, shews that suppuration has occurred and the hardness considered by him the test of absence of pus, arises from the presence of this, it being confined as yet to narrow limits and stretching the skin over it, in the endeavour to make an exit. It is not till the skin becomes soft from absorption when extensive mischief has been done, that he considers the boil ready to be opened. A case strongly illustrative of the practical utility of the above remarks occurred here a few months ago. An Elephant which was caught in a pit, had, when falling therein, been severely injured in one of the forelegs; swelling and eventually suppuration occurred. The limb nearly twice as large as the healthy one, felt as hard as stone, the hardness arising from confined pus. The Mahouts however asserted there could be no pus present, seeing the hardness of the swelling. They were convinced of their error only when a free opening was made into it, when there escaped several pints of fetid pus, the first portions of which were projected several feet from the orifice of the incision. This distant projection of the pus was a corroborative proof of the great and distressingly painful distension of the parts. The delay of making an early incision in the case occasioned extensive inflammation, and so much pain, that the animal with the view to relief, supported the forepart of its body principally on the healthy foreleg; but constant pressure thereon,

caused the under part of the foot to mortify, and this mortification occasioned the death of the animal, a result which, early judicious treatment could have doubtless prevented.

BOOMANEE OR BUMBNEE.

History.—This which is a rare affection consists in the loss of a great or less portion of the tail, sometimes the whole, by a slow process of mortification, commencing at the extremity of the tail, and successively attacking the higher parts, joint by joint. If not interfered with by remedies, it will eventually remove the whole of the tail, but attack no other part of the animal, having then expended itself. It does not interfere with the animal's capability for duty during its continuance, and does not prove fatal. The animal is usually in good condition when this affection shews itself. The cause of it is not evident.

Treatment.—The treatment consists in applying any stimulating ointment, as turpentine mixed with wax, to the diseased part, after it has been well washed ; or blue stone with lard, in the proportion of 40 grains of the former to an ounce of the latter. The Native recipes are given in page 83, which may be practised with benefit.

KANDI AND BUMBOODE.

Whitlow of the Feet.

History.—The first of the above terms is applied to ulceration on the soles of the feet ; the second to the same affection when situated above the nails, or lower parts of the extremities. This affection is the result of a bruise, or of a prick inflicted by the animal treading or accidentally knocking its feet against thorns, sharp pieces of stone, &c. It may also arise from the continued marching of the animal over wet muddy ground. Inflammation and suppuration follow, leaving an ulcerated surface or sinus.

Treatment.—The treatment consists first, in the application of fomentations, whereby the inflammation will be moderated, and possibly suppuration prevented. The foreign substance, whether thorn, &c., should, it is scarcely necessary to say, be removed as soon as possible; and diligent search ought to be made if doubt exists as to its presence within the foot. Then, if ulceration exists, detergent applications, as camphorated oil or blue stone solution, ought to be injected by means of a syringe, then the orifice ought to be filled with a piece of cloth to prevent mud, &c. getting into the wound, thereby occasioning further irritation, which prevents the curative process going on.

These injuries are extremely tedious of cure; they always more or less interfere with the efficiency of the animal, and may wholly disable it. They may intentionally be inflicted by the attendants to incapacitate the animal for duty, and thus escape the fatigues or the dangers, real or supposed, of active service. As animals may speedily be incapacitated for further service, when marching over rough roads, in consequence of severe injury being done to the feet, every diligence ought to be taken to ensure inspection of the feet after coming off a march, more especially during the movements of a Force. If need be, one or more persons ought to be detailed to point out to the Mahout, such parts of the road as are free of all bodies likely to occasion injury, as stumps of shrubs, &c. whereby all excuses for injury to the animals from such sources will be removed, and consequently security ensured against intentional injury to the animal on the part of its keeper.

When the animal is required to march over rough ground, such as is likely to occasion the injuries at present under consideration, the attendants resort to the devise, ingenious certainly in conception, if not really useful in practice of applying to the soles of the feet, a composition with the view to harden them. The following are two recipes for these compositions. I have had no experience of their efficacy, but consider them worthy of insertion, as their use can do no harm, but may prove useful on trial. I learned this practice when submitting to one of the Cattle attendants, the practicability of defending the animal's feet by mechanical means, such as leather bags with iron soles, when either by the act of the enemy, or from the natural state of the road, its condition is such as to endanger injury to the animal from the causes under consideration. This project is not by the attendants supposed to hold out much likelihood of proving practically useful, as the animal thus encumbered, it is supposed, will not move, or do so very slowly. The following are the recipes for preparing the composition for hardening the soles of the Elephant's feet :

Take of—1. Wax, any quantity.
2. Chunam, ditto.
3. Mansul, ditto.
4. Dried Spleen of any animal.
5. Honey, any quantity.

The ingredients 2, 3 and 4 to be powdered and mixed with the wax and honey, and then to apply on soles of feet once or so.

Take of Churke.
Mahpul.
Zinga Ulde.

Uldha.
Kuttha.
Gotee Suparee.
Mohar.
Shaoth, any quantity of each; grind together the above, and mix with honey; then apply to soles of the feet.

LUTCHUP.

Sprain.

History.—The Elephant is a very surefooted animal, and will ascend or descend inclinations of such steepness, as without personal observation would startle belief. I have seen one descend the bank of a river, the inclination of which was at least 60; this animal was not loaded, but I am told, with half a load on its back, it would go either up or down such an inclination, provided it consists of earth. In descending steep inclinations, it goes on its hinder knees, then as it were, walks on its forelegs, drawing its body after it, its ponderous weight causes its forefeet to flatten the bank, and thus to form for itself a flight of steps. In ascending, it goes on its knees if the bank be of the steepness above alluded to, nevertheless it does when engaged in such steep ascent or descents, occasionally, get sprained, more especially when it is hurried.

Treatment.—The Native treatment of this accident does not evince much philosophy. It consists in causing the animal to undergo severe bodily exertion, such as swimming in water or walking knee deep in mud. The latter exertion I have known to have caused an Elephant which was on the march, and accidentally got into a quagmire knee deep to break its leg in its endeavour to extricate itself. Fomentation and rest, and if need be, bleeding, promise a more certain cure.

SUB-CUTANEOUS SUPPURATION.

History.—This injury arises from inflammation caused by unequal pressure of the animal's load, or by the ropes by means of which its burden is fastened on its back. The inflammation does not primarily attack the skin, but the more delicate membrane beneath, that connects the skin to the parts it more immediately covers: such inflammation, which is shewn to exist by more or less swelling of the injured part, may frequently be subdued, if early submitted to the simple treatment of fomentation; vide page 60 for instructions regarding fomentation. But if it be completely neglected till the usual consequence, viz. suppuration, and also sloughing of the membrane

in question follow, an abscess more or less extensive will arise. It is an injury very apt to occur, and therefore demands strict supervision when the animal is being loaded, that no part of the body of the animal on which the load rests, be without due protection of the pad, and that the ropes passing down the sides and under the belly be properly secured against causing abrasion by the interposition of leather between them and the body. Inattention to these particulars may speedily deprive a force of the valuable services of the animal.

Treatment.—Under what circumstances soever the injury has been caused, the injured parts ought, as soon as possible, to be well fomented. This measure as just stated, may cause the inflammation to subside, or if the injury be of such degree, that suppuration cannot be prevented, the fomentation will moderate the inflammation, while it expedites the suppurative process. As soon as matter has formed, let an exit be given to it externally by free incision; an opposite course may render the animal useless for many months, and the cogency of early incision is set forth under the head of suppurative boils; which, as the same principles are involved as respects the ailment just referred to, in regard to treatment and consequences of neglect in the injury now under consideration, the remarks under that head will be advantageously consulted in reference to the present injury. In consequence of not making early incision in a case of subcutaneous suppuration, an Elephant was under treatment here upwards of a year. The skin had from the consequence of an injury, such as is now being considered, been separated from subjacent parts to an enormous extent, namely, throughout the greater portion of posterior, part of back, and haunches. The wonder is, that so extensive a suppuration of the skin was not followed by the detached portion sloughing off, altogether. Had seasonable opening been made in this case, much of the extensive mischief above detailed, would have been avoided.

The subsequent treatment is similar to that recommended for the after treatment of suppurative boils, with the addition, if need be, of pledgets of cloth inserted to prevent the orifice of the incision closing, whereby the pus would be again pent up. The incisions ought to be more or fewer in number, according to the extent of surface undermined—say about 6 inches apart. These pledgets of cloth will allow the adhesion of the skin to the subjacent parts to proceed regularly from the circumference of the subcutaneous ulcer to the central parts where the incisions are situated.

If extreme suppuration go on the animal ought to be allowed a generous diet.

PART 2D.

INSTRUCTIONS OF A PROPHYLACTIC KIND, OR REFERRING TO THE PRESERVING OF THE EFFICIENCY OF THE ANIMAL WHILE IN HEALTH, AND REMARKS ON OTHER SUBJECTS CONNECTED THEREWITH.

In the former part of this Memoir we have seen that negligence may in several ways materially impair or wholly destroy the efficiency of the Elephant during the employment of the animal with a Force. This untoward event is most likely to occur from the following two causes, viz. injuries of the feet and abrasion of back from direct pressure of the load.

1ST—INJURIES OF THE FEET.

These are very liable to occur when the movement of a Force is over stony ground, or in woody situations through which roads have been opened up by the Pioneers, on which occasions the bushes are not always cut even with the ground, but stumps, an inch or two, are frequently left standing. The animal may unawares tread either on some of these stumps or on sharp pieces of stone, and in either case cripple itself more or less. It therefore will be a prudent measure to parties to go in advance of the Elephant, and to point out to the Mahout where such possible sources of injury are situated, and this is the more advisable as thereby all source of excuse for the animal being thus rendered inefficient is removed, and consequently a check instituted against malpractice on the part of the Mahouts in rendering their animals inefficient with the view to escape the fatigue of active service.

When the route of a Force is over road such as above alluded to, recourse is sometimes had to the hardening the soles of the Elephant's feet by the application of a composition as stated in Part 1st under the head Boomanee, page 22. The remarks there made, need not here be repeated, but are well

worthy attention, as illustrative of the advantage of resorting to the precautionary measure now recommended. Quagmires ought also to be carefully avoided. An Elephant got into one of these in this vicinity lately when on the line of march, its load being on its back, and broke its leg in its endeavours to extricate itself, whereby it was rendered useless and was shot. This quagmire was concealed by water being on the road over it.

2D—INJURY OF THE BACK FROM DIRECT PRESSURE OF THE LOAD THEREON.

The kind of injury arising from this source, and the extent to which it may operate are detailed in Part 1st under the head Subcutaneous Inflammation, page 24—this is a very frequent cause of rendering the animal more or less inefficient, and causes of this kind are almost uninterruptedly under treatment at Hoonsoor. While writing this, there are three Elephants under treatment for it, two of which have just returned from on Command. The injury was confessedly caused by the padding being out of order, in consequence of which, the loads pressed directly on the shoulders, and thus occasioned inflammation and suppuration to an extent that will require some months to cure.

I am informed, that the guddalah or pads placed on the backs of Elephants, to prevent their loads making direct pressure on the animal's back, are very liable to become rotten when exposed to rain. As therefore the efficiency of the Elephant is mainly dependent on the serviceable condition of these pads, too much attention cannot be given to ensure their being kept under cover, and secondly, from wet when the animal arrives at the halting Station. One month's continued exposure to wet will render them useless, and this was proved in respect of the pads of the two animals above alluded to, which were exposed for about a month to the Monsoon of the Western Coast. The pads and other furniture at present in use for the Elephant are as follows: 1st. The Numdha, which consists of hair well felted together, it is about an inch thick, and about two yards square: it has a covering of gunny on the upper side, and one of coarse cloth on the under. The latter is in immediate contact with the back of the animal. 2d. The guddalah, placed on the top of the Numdha, which consists of two bags of gunny, filled with pataroh, (bulrushes) and about a foot thick, and two feet broad, the length about four or five, variable according to the size of the animal. These bags are joined sideways, near either extremity, the space in the middle receiving the spinous ridge of the back bone of the animal. 3d. Neemgadhie, which is of similar construction to the guddalah, but smaller in all its dimen-

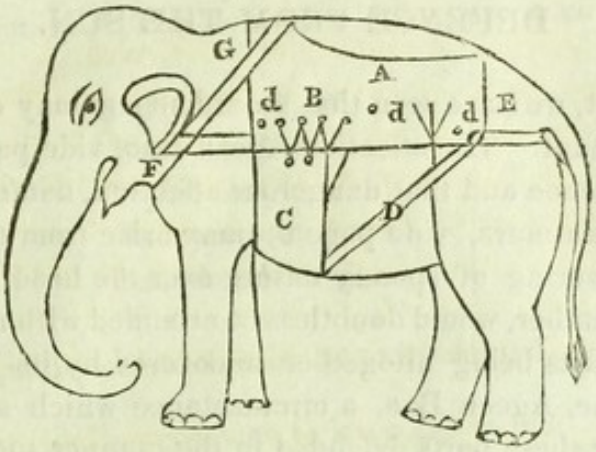
sions. 4th. Over the whole is placed the jhool, which is a cloth consisting of gunny. 5th. A rope about an inch in diameter, by which the above are fixed on the back—one end of this rope is converted into a loop, sufficiently large nearly to surround the body of the animal and the pads. It is tied on the top, thence passed singly round the neck, then along the upper sides of the pads, then below the tail, and finally tied again at the place of first knot on the top. The parts which pass below the belly and below the tail, are sheathed with leather, to prevent abrasion from so narrow a body as a rope.

Of this furniture, it is the gunny only that rots from exposure to wet, and keeping in mind its liability so to do, a very important question suggests itself, seeing the efficiency of the animal is essentially involved therein, whether some more durable substance could not be substituted for this gunny, if it cannot be, by some process, made more durable.

In order to preserve nets from rotting by immersion in water, fishermen in Britain steep their nets in a decoction of oak bark ; the nets are thereby saturated with the tanning principle, which greatly adds to their durability. I understand the fishermen of this country also submit their nets to a similar process for a similar object. The bark of the Cassia Auricolata being the substance used in India, instead of oak bark as in Britain. Would it not therefore prove beneficial to submit the gunny to a similar process with a view to add to its durability? or how far would it be advantageous to substitute for it, leather or tarpaulin, i. e. canvas saturated with tar ? Comparatively little importance is involved in this subject in times of peace, but in reference to a Force moving beyond the Frontier, more especially when difficulties for the renovation of the old pads may exist, it becomes one of considerable importance.

It appears to me that considerable improvement might be effected in respect to the manner of securing these pads on the animal's back ; this, as just mentioned, is effected by means of a rope : now, although the double fold of rope, which by way of belly-band passes below the animal, is defended by a sheathing of leather, this is by no means a perfect security, for frequently when the animal is on a long march, the part of the body on which the rope presses becomes inflamed, the same injury occurs to the part of the neck pressed on by the rope which passes around it, and also to the part of the body below the tail, though not so frequently as the lower part of the belly.

With the view to defend this latter part from injury, it occurs to me that the following arrangement would be more efficient than the one at present in use of double rope and leather sheath.



REFERRING TO THE SKETCH ABOVE.

A represents the Numdha which for about 1½ feet of its lower edge on one side, should be, is furnished with holes (9 in number) in which are fixed iron rings, as at B. C is the belly-band attached permanently on one side to Numdha. At end above C, this belly-band should be furnished with an equal number of holes with iron rings as in the corresponding portion of the Numdha immediately above at B. By passing a rope alternately through the rings of the Numdha and belly-band, the latter can easily be drawn to the necessary degree of tightness. The belly-band ought to be 12 or 16 inches broad and to consist of three folds of gunny with a thin lining of Numdha or felt, on one side which is situated next to body. Then by means of other ropes passing through rings as d, d, d, the pads can be attached to the Numdha and thus secured on the animal's back.

The animal is put to much inconvenience by the rope passing underneath the tail. This apparently could be conveniently superceded by a sort of breaching consisting of D going below the body, and E round the buttock a short way below the junction of tail with body. From the angle E, where these belts meet, rings may be placed to receive the rope from top of pad. Then as regards the neck, a broad band F might be placed on under part, to which the rope G, with the corresponding one in opposite side, could be attached.

The above are the two most common causes of rendering the Elephant when on active service more or less inefficient. Nevertheless attention to the subjoined prophylactic remarks will be attended with benefit.

PADS TO DEFEND THE HEAD WHEN PUSHING.

Pads to defend the head when the animal is required to lend his aid in pushing, ought always to be applied. If he bruise or injure himself when so employed, and this he is liable to do if the pads be not used, he will most likely refuse again to give assistance in this way.

DEFENCE FROM THE SUN.

In the 1st Part, we have seen that an ardent sun may operate very injuriously on the Elephant. The affection Ageen Bao, vide page 10, is the direct result of solar influence and that dangerous affection, namely, inflammation of the brain. Bhao-ka-murz, vide page 9, may arise from the same cause. A white coloured covering of spongy nature over the head and forehead to be worn during hot weather, would doubtless be attended with much comfort to the animal, as these parts being altogether uncovered by its load, are the most frequent seat of the Ageen Bao, a circumstance which shews strongly the propriety of having these parts defended in the manner suggested.

SUDDEN CHANGES OF TEMPERATURE TO BE AVOIDED.

On coming off the march the Elephant ought to be allowed to cool, previously to being washed, negligence in this particular is apt to occasion serious disease. The animal when in a heated state may be allowed to drink water without the chance of any untoward effects resulting.

MOST HEALTHY SITUATION FOR PICQUETING THE ELEPHANT.

Elephants ought to be picqueted in open elevated ground, not in topes. The only exception to this rule that ought to be made is with the view to obtain shelter from the effects of a hot sun—so during the heat of the day they may advantageously be picqueted in shady places, as in topes, &c. The Elephant Lines at Hoonsoor are on elevated open ground,to which place they were moved from a low sheltered site, the latter having been found unhealthy to the animal.

DIET.

The diet of the Elephant consists of Cherraie or fodder, and Ratib, or allowance of rice. There are four sorts of grass which the Elephant prefers to all other kind of fodder and which agree best with it. These are in Hindustanee called Kusseelah—Kala-puttairah—Guttaoloo. There is a grass called Panee-ka-Arecalee, which is a long species that grows in some tanks, which if used continuously is liable to occasion Lungun (worms) not however from any quality the grass itself possesses, but in consequence of a weed which grows amongst it, and with which it is intimately mixed—the continued use of this causes the ailment in question. Branches of trees constitute less nutritious food to the Elephant than grasses, and are moreover of a more heating nature, nevertheless the animal can live on them throughout the year and

usually with impunity. The following trees are used as fodder by the Elephant :

Peepul-ka-jhar.
Bhur-ka-jhar.
Piplee-ka-jhar.
Nandaroo-ka-jhar.
Raambahd-ka-jhar.

The relative quality of which is in the order named, the first being the best.

The Ratib, or rice, is necessary to keep the animal in condition, but in inflammatory affections ought to be suspended, being of a heating nature. Till within a few years ago, Elephants were allowed from half a seer to a seer of jagghery with their ratib ; for this, however, common salt was substituted, but the Elephant attendants do not consider the change advantageous.

WATER.

An Elephant is watered twice daily, and at each time it requires about 24 gallons of water. Elephants are very nice as to the quality of water they use. They prefer clear to turbid, and refuse to drink water procured by digging in the sandy beds of rivers ; however, if very much harassed with thirst they will partake of it, but only sparingly, they loathe stagnant water, or that containing more or less salt (common salt,) and alkali, which is common in many localities over India. The animal cannot support a deprivation of water much beyond 24 hours.

DESIRE FOR PROCREATION.

The female Elephant seldom exhibits in a prominent degree a desire for procreation. With the male it occurs about once a year, but in no particular month. During the continuance of this state the animal is more or less unmanageable, and unsually so much so as to be incapable of being employed with safety or benefit. Accordingly when this state supervenes on a march, it is necessary to picquet him at a convenient place till it subsides. This may be a business of some weeks, even months, if no interference be made ; however, the following Mussallas if given, are said to have the effect of curing the animal in a day or two. I have no personal experience of their effects on the animal, so give them solely on the authority of a sensible Elephant attendant.

Munsal,..... 1 Tolah weight.
Laong or Cloves,..... 2 ditto ditto.
Chavul or Rice, ... 2 ditto ditto.
Gaee-ka-Dood'h, (Cow's milk,).... 4 seers.

Boil the milk, pulverize the rice and add, mix well, then add the other two ingredients and give one part in the morning, and in the evening repeat the other part. The two doses will be sufficient.

2D MUSSALLA.

Bukree ka-dood'h, ...	5 seers (Goat's milk.)
Gudheeka-dood'h, ...	¼ ditto (Ass' ditto.)
Sukeea Soomul, ...	5 Tolahs (Arsenic.)

Powder the Arsenic and mix with the milk, and boil the whole for a little—then add a small quantity of tyre or duhee to cause the milk to curdle, mix the whole well, give a tolah weight morning and evening. The two doses are said to be sufficient as illustrative of how much may be done with the view to preserve the efficiency of Public Cattle by the establishment of systematic checks against carelessness, and still more of checks to malpractices on the part of the attendants; this part of the present Memoir cannot better be concluded, than by stating the success of arrangements instituted at Hoonsoor to accomplish the important object just stated by Major Watkins, Deputy Commissary General, when in charge of the Public Cattle Department. It is one of the many improvements effected in the four Public Establishments that were confided to the charge of that zealous Officer at Hoonsoor, when Senior Assistant Commissary General.

Assuming it as a principle that sore backs and injuries to the feet of the Elephant or Camels were, unless the contrary could be proved, the result of negligence on the part of the attendants, Major Watkins instituted the rule, that so long as animals were under treatment for such injuries *half* of the Cattle attendant's pay should be stopped, unless good cause could in individual cases be shewn why the rule ought not to be put in operation.

The immediate result was a great reduction of the number of these injuries and while previously to institution of the above rule, there were in Hospital always a comparatively great number of animals under treatment for them, more especially of Camels; *now* we rarely see a case. In fact in former times, there was a premiumon disability of the Public Cattle; for so long as the Mahout or Sirwan was permitted to draw full pay, whether his animal were efficient or otherwise as in the latter case, he escaped detachment duty, exemption thereby obtained from personal exertion too often suggested malpractices to secure it.

During a campaign the principle of reward for the continued efficiency of Cattle might advantageously be brought into operation simultaneously with punishment for the opposite condition.

PART 3D.

THE MATERIA MEDICA, OR A SUMMARY VIEW OF THE VIRTUES AND DOSES OF THE MEDICINES, AND A STATEMENT OF SEVERAL CURATIVE MEASURES.

In this part of the present Memoïr, I propose giving a brief account of the different classes of medicines, and to name the most efficient belonging to each class, also to give a Catalogue of the substances prescribed by the Mahouts, and likewise to name several of their prescriptions for Mussallas or Medicinal preparations.

As mentioned at the commencement of the 1st Part of this Memoir, the natives arrange medicines in only two classes—those that are considered heating are included in the one—those that are supposed cooling, in the other; a classification based on their theory of disease, which is that all diseases are the result either of a calorific or of a refrigerant state of the system.

The classes of medicines about to be stated, are based on the known effects of the medicines included in each, and are arranged alphabetically.

ALTERATIVES.

This class of medicines is very useful in affections of the digestive organs of an obscure kind as to their nature, though very palpable as to their effects on the condition of the animal. They are largely used by the natives in their Mussallas and advantageously. It is in this class of ailments that native treatment appears the most efficacious.

Calomel.—This is not used by the Cattle attendants, at least it does not directly enter into the composition of their Mussallas, but may be found during the process of compounding. It is a useful medicine and in ½ a drachm or drachm doses will, when indicated, prove useful.

Urthal or Orpiment (Sulphuret of Arsenic) dose ½ ounce to one ounce, likewise very useful.

Shemroofe.—Vermillion (Red Sulphuret of Mercury) dose ½ to 1 oz. useful.

The last named two medicines are frequently used as alteratives, and are valuable medicines. The above doses are to be considered only for exhibition once or twice ; when a continued use is considered advisable, one to two drachms daily constitute a dose. When salivation occurs during the use of these medicines, this is an indication that the system is fully under their influence, and their further use is then to be stopped, or suspended, as perseverance in their use subsequent to the occurrence of salivation would be prejudicial.

Borax—Sulphur.—These two are likewise used as alteratives, and are useful in mild digestive derangements.

Aloes.—In doses of 1 to 3 oz. is also a useful alterative.

ANTHELMINTICS,

Or medicines for worms in the bowels. The alimentary canal of the Elephant is as stated at length under the head Lungun, in Part 1st of this Memoir, page 18, subject to be invested with worms. These are effectually scoured out as mentioned under the head Purgatives, page 36, by the use of earth, which the animal instinctively and immediately resorts to, when troubled with worms. These sometimes accumulate to an enormous number, and after the Elephant takes earth they are usually passed dead. The earth is a most efficient cleanser of these worms, but tonics are required to restore the vigour of the digestive organs, on the derangement of which their existence seems to depend.

CARMINATIVES AND STIMULANTS.

This class of medicines is in frequent use in spasmodic affections of bowels, or in impaired function of the digestive organs. The most important are, marking nut, sweet flag, ginger, cinnamon, cloves, black pepper, chilli. Of these the marking nut is the most powerful. It may be given in doses from 4 to 12 drachms.

EMETICS.

No medicine, whether animal, vegetable or mineral, is known to the Mahouts as having Emetic effect on the Elephant. I have given Tartar Emetic in two ounce doses, morning and evening, till half a pound was taken,

but no Emetic or other obvious medicinal effect followed. The animal continued to eat as usual, but some difficulty was experienced in getting it to take the last two doses apparently from there existing something in the medicine whether taste or otherwise, being disagreeable to it. In doses of one or two drachms daily, Tartar Emetic is advantageously exhibited in the disease Peepsa-ka-Murz, or inflammation of the lungs.

EXTERNAL APPLICATIONS.

1st. Detergents of Ulcers, &c.

Camphor.—This dissolved in Jingili oil in proportion of 6 ounces of the former, to 24 ounces of the latter, constitutes a very useful external detergent and stimulant to foul ulcers—the proportion of 4 drachms to 24 ounces of water, also constitutes an useful topical application to foul ulcers. The above are largely and advantageously used to ulcers of feet and back.

2d. Blisters and Topical Irritants.

Turpentine.—This alone if mixed with Jingili oil, in greater or less proportion, may be advantageously used in foul ulcers.

Blistering Ointment and Turpentine. In the proportion of 4 ounces of the former to 8 ounces of the latter, mixed, constitute an efficient blister, when applied to the skin about the neck, and will either blister or stimulate to a considerable degree the thicker parts of the skin. It is a useful application, used as a stimulant in Rheumatic affections, and may be applied over a couple of feet square.

3d. Fomentation.

Under the head of topical applications properly comes the Fomentation. This is a most useful application, and from the extent to which it may be used, can be made to exert much curative influence on internal complaints, as inflammations and spasmodic ailments. In Sprains and Rheumatic affections of joints and tumours, of an inflammatory character, it also is very useful, as it moderates the process of inflammation, and facilitates the formation of pus, when topical inflammations cannot be prevented running on to suppuration.

The mode of using fomentations as practised here, is as follows :—Cow-dung is mixed with water in such proportion that the mixture has a semi-fluid consistency. This being heated in a large chatty is applied to the body over as much of the surface as is deemed necessary for the particular malady under

treatment. The application is continued uninterruptedly till a coating of it has accumulated, the thickness of which prevents the rapid dissipation of heat. When it is wished to foment the back and sides of an Elephant a flannel cloth (jhool) ought to be first thrown over the back and the ends tied together beneath the abdomen,—then hot water without cow-dung may be applied to the cumblie by means of a brush as above alluded to. This will soon become saturated with hot water, and the continued application of this will keep up its temperature, which the thickness of the cloth will prevent immediately becoming reduced.

OPIATES AND ANTI-SPASMODICS.

Opium—Assafœtida—Nutmeg.

Opium.—Is a medicine in frequent use, and is advantageously given in spasmodic affections of bowels, as spasmodic colic (Pet-ka-durrud,) page 16, and flatulent colic (Wiegollah,) page 17. The dose may be from 1 to 9 drachms, according to the severity of the case.

Assafœtida.—Is also a medicine in frequent use in the spasmodic diseases above named. It is also a valuable medicine in functionary derangement of the digestive organs, during the existence of which the animal falls more or less out of condition, loss of flesh and strength supervening. It may be given in doses of one or two ounces. Nutmeg is advantageously combined with the above in doses of one ounce to three ounces.

PURGATIVES.

This is an equally important class of medicines in regard to the Elephant as to man, and the other animals which he employs to assist him by their physical powers, but strange to say, it is a class of medicines, the effects of which on the Elephant are by the attendants, wholly unknown. Accordingly they never prescribe purgatives, such having no place in their Materia Medica. The aloes indeed is a common ingredient in their Mussallas, but it is given with an alterative and tonic object, the dose prescribed being immensely smaller than what is required to produce purgation.

Before detailing the doses of substances I have found useful as purgatives, I will describe the practice the Elephant itself resorts to, and which instinct suggests to produce purgation ; only in one affection does the Elephant resort to it, namely, in the disease Lungun, or fasting, which as stated in page 18, consists in an accumulation of worms in the alimentary canal. When irritation arises from this cause the animal swallows a variable quantity of

sandy earth, generally however, about 10 or 12 seers; twelve hours thereafter copious purgation results. This effect appears brought about by the mechanical qualities of the earth, and not from any chemical quality it may possess, for I have observed, that it is not earth of any particular chemical kind the animal uses, but the one requisite appears to be possessing of small solid particles of mineral of any kind, usually however, silica or quartz; and this exists in sand of a degree of coarseness, such as is used for preparing mortar. This point appears fully settled from the fact, that the animal will, and does frequently use, common river sand, to bring about purgation. It will readily be understood, that such cannot contain, at least in quantity, any soluble saline substance, and I have satisfied myself, that what has been used contained nothing that could, by its chemical qualities, produce the effect under consideration. But there evidently is required a particular state of the alimentary canal, to admit of purgation being produced by the mechanical effects of earth, or rather sand. This at least appears very probable from the fact of my having given the Elephant earth in considerably larger quantity, during the absence of Lungun, than what the animal takes to produce purgation, but without the smallest purgative effect resulting. I have given it to the extent of 10lb. doses for five days successively, making an aggregate of 50lbs. and not the slightest symptom of purgation followed. I was induced to make this experiment with a view to determine whether earth, under all conditions of the animal, will operate on it as an aperient. The decisively negative result, from so large a quantity of earth, as that just stated, very distinctly settles the question, and shews that a particular condition of the alimentary canal is essential to its successful effect, a condition, the existence of which, the instinct of the animal unerringly intimates and suggests the remedy.

Aloes and Croton Oil Seeds.—I have found efficient purgatives.

Aloes is required in doses of 6 to 8 ounces of good Aloes.

The Bazar Aloes is a very uncertain remedy, being occasionally almost inert; six times the quantity just stated of the common Bazar Aloes is to be coarsely powdered, put into the ratib, and included with it in the grass envelope, in which the latter is always given. The older Elephants usually take the medicine willingly, at least apparently so, but the younger frequently reject ratib, and all, when they taste the medicine. In cases where the tonic qualities of Aloes are wished to be brought into play, as well as the aperient, it may be advisable to exhibit this medicine in preference to Croton Seeds; accordingly it may be given in frequent small quantities, and the usual allowance of ratib may be divided into several portions instead of 3 or 4 the usual number. This expedient will usually be success-

ful ; if not there is no alternative, but using the Croton Oil Seeds or other aperient.

Croton Oil Seeds.—This medicine in doses of three quarters of an ounce to an ounce and a half, will be found an efficient purgative ; it is to be powdered and given along with the ratib in the manner above described for the exhibition of Aloes. No difficulty will be experienced in getting the animal to take this medicine, as I have known no one instance in which it was rejected. It may advantageously be combined with Aloes. By means of either or both of the above, purgation copious and free, can be produced under all conditions of the animal, so long as the power of swallowing exists, and also sufficient tone of the organs is present.

Castor Oil.– Even to the extent of a quarter of a gallon will not produce purgation.

Epsom Salts.—In doses of three or four pounds is useful as a purgative, and so is calomel given to the extent of an ounce for a dose.

TONICS.

Margosa Bark—Milky Juice of the Madaar—Assafœtida—Chunam.

This class of medicines is extensively used, in conjunction with alteratives and carminatives, for the treatment of an impaired condition of the digestive organs. Margosa bark, the milky juice of the Madaar, and Assafœtida, are useful medicines as tonics.

SUBJOINED ARE NATIVE RECEIPTS FOR THE SEVERAL MUSSALLAS USED IN THE NATIVE TREATMENT OF THE DISEASES OF ELEPHANTS—THEIR RELATIVE UTILITY HAS BEEN ALREADY SPECIFIED IN PART 1st, UNDER THE HISTORY OF EACH DISEASE.

Mussallas for Zaarbadh.

Take of—

No. 1. Urthal, ... 2 Gold Pag. weight.
Maindook or Frogs, ... No. 4.
Datoorah-ka-russ, ... 16 ounces.

Take out the entrails of the frogs, cut off their legs and fore-arms, and put one-fourth part of the urthal into the abdomen of each frog, and to be secured

by rolling thread round, grind the frogs and urthal in the juice of the black strammonium, till the whole forms a mass of solid, though soft consistency, and make into pills, each of the size of a Bengal pea; one to be given every morning, continued for 12 days if necessary. If benefit be effected in that time, continue till the whole swelling disappears. In the evening daily, give one entire part of the herb cheetra moolum. If no benefit within 12 days, stop and give the following :

No. 2. Take of—

1. Ingun-ka-chal,	Seers	2
2. Amalthas-ka-chal,	ditto	2
3. Lussoon,	ditto	½
4. Uldha,	ditto	½
5. Kallee-zeerah,	ditto	½
6. Urthal,	Tolahs	1
7. Shemroofe,	ditto	1
8. Moordhar Sung,	ditto	1

Bruise the two barks well, and put in a large chatty, pulverise well the ingredients 6, 7 and 8; and 3, 4 and 5 to be well bruised. Put all these in the chatty with the bark. The mouth of the vessel to be covered with a piece of flat tile and a piece of cloth to be put over all, and then made air-tight with clay. Dig a hole in the ground on a Sunday morning, so deep as to allow the top of the chatty to be about a foot below the surface, and to be covered with earth. Take out the chatty the following Sunday, grind its contents into a well incorporated mass and divide it into pills of about 1 inch in diameter. Of which give one every evening and to be continued for a week. If any benefit is effected, continue till the disease disappears. If no benefit within that time, stop and give the following :

No. 3. Take of—

1. Moordhar Sung,	Tolahs	2
2. Shemroofe,	ditto	½
3. Lussoon,	Seers	¼
4. Moosumbur,	ditto	¼
5. Rayon,	ditto	½
6. Laull Mirchee,	ditto	¼
7. Oodooth-ka-attah,	ditto	1

The ingredients 1 and 2 to be well powdered—4, 5 and 6 to be powdered also and mixed, then the ingredients 3 and 7 to be bruised and added, the whole to be again pounded. Divide into doses of one Mysore pice weight, these to be made into cakes of about 1 inch in diameter, fry the cakes in

country sweet oil, (Jingili oil) they are of brown colour, taking care not to burn them—and one cake to be given every morning, and to be continued for 8 days: if improvement is effected continue, if none within that time, stop and give the following:

No. 4. Take of—

1. Russchendoor,	Tolah	1
2. Munsel,	ditto	½
3. Urthal,	ditto	1
4. Gundugh,	ditto	1
5. Geong-ka-attah,	Seer	½

All the above ingredients to be well pulverized—as much Arrack is to be added as will make the whole into a paste, then divide into pills of about the size of a pea, and give one morning and evening for four days. If improvement is effected, continue till recovery.

MUSSALLAS FOR BHAO-KA-MURZ.

No. 1. Take of—

1. Urthal,	Tolahs	2
2. Moordhar Sung,	ditto	2
3. Munseel,	ditto	1
4. Shemroofe,	ditto	1
5. Russchendoor,	ditto	1
6. Kala Beetchwa,	ditto	3
7. Ambee Ullud,	ditto	6
8. Uldhee,	ditto	6
9. Sohagah-ka-killee,	ditto	7

Powder all the above and mix then, add as much honey as will form a mass, and divide it into pills of about ½ an inch in diameter, and give one when the disease appears. If the animal keeps quiet, nothing need be done, but if the paroxysm comes on again, repeat it, and repeat every hour if need be.

The above is for the apoplexy and inflammation of the brain.

MUSSALLAS FOR AGEEN BHAO.

No. 1. Take of—

1. Deighu,	Seers	3
2. Tabaseer,	Tolahs	6

3. Misseeree,	Seers	3
4. Jeerah,	ditto	1½
5. Awul Guntee,	ditto	1½
6. Soheif,	ditto	1½
7. Ujevan,	ditto	1½
8. Peeaz,	ditto	6
9. Dhal Chinnee,	ditto	1½
10. Geong-ka-attah,	ditto	6

Pulverize the ingredients 3 and 5 and add the other ingredients, then divide it into three parts, and give one every morning in the shape of bolus.

Apply externally to the eruptions :—

Teerwaad-ka-puttha,	Any quantity.
Deighu,	ditto.

To be mixed and applied to the eruption.

MUSSALLAS FOR DAAK-KA-MURZ.

No. 1. Take of—

1. Koochlay,	Seer	¼
2. Beelamay,	ditto	½
3. Dik-kamallee,	ditto	½
4. Moosumbur,	ditto	½
5. Moorgeeka-punaha,	Tolahs	3
6. Peepleean,	ditto	3
7. Reeshum-ka-Cuppada,	ditto	3
8. Karee Muchie,	Seer	½

Pulverize together, then mix with as much honey as will form a mass. Then divide into pills about the size of a small lime, and give one every hour till vomiting cease, commencing immediately when the animal is seized. If the medicine cannot be taken in the form of pills, the bolus to be mixed with more honey, and rubbed on the tongue.

No. 2. Take of—

1. Hing,	Tolahs	3
2. Gundugh,	ditto	6
3. Para,	ditto	3

These to be well grounded together, and 2½ Mysore Pice weight to be given at the commencement of the disease, and repeat every hour if need be.

No. 3. Take of—

1. Kaghoor,	Tolah	1
2. Murkaghoor,	ditto	2
3. Bulchuaag,	ditto	2
4. Kala Beetchwa,	ditto	1
5. Hurbesee,	ditto	1
6. Neerbesee,	ditto	1
7. Davoday Kapool,	ditto	6
8. Geong Ullah,	ditto	6
9. Afeeme,	ditto	1
10. Mahl Kungnee,	ditto	6
11. Bhaz Bunnosah,	ditto	3
12. Bhung Bunnosah,	ditto	3
13. Bhun Bunnosah,	ditto	3
14. Avalsa Gungugh,	ditto	3
15. Shemroofe,	ditto	3
16. Russchendoor,	ditto	3
17. Koochlay,	ditto	18
18. Beelamay,	Seer	1

All the hard substances to be pulverized, 18 to be fried in one seer of ghee; in the same ghee then fry the ingredient 17, the ghee containing the medicinal virtues of 17 and 18 which are then to be thrown away, is added to the powder consisting of the other ingredients. The whole then to be put into a new pot, the mouth is then to be well closed with cloth and mud, bury the pot near an Elephant, one week after which take out, divide into pills about the size of a small lime. To a large Elephant give one every evening, to a small animal give one half.

MUSSALLAS FOR PEEPSA-KA-MURZ.

No. 1. Take of—

1. Kulleeka Choonah,	Tolahs	1
2. Uddaruk-ka-russ,	ditto	4
3. Kalee Sudghee,	ditto	2½
4. Sohagah,	ditto	½
5. Hing,	ditto	1
6. Rayan,	ditto	3
7. Neemboo-ka-russ,	ditto	4

Pulverize the hard substances, slack the chunam with 4 ounces of water, afterwards take off the water; when saturated with lime, mix this and the juice of ginger with the powders and make into two boluses, one of which to be given immediately, and the other, two hours afterwards.

No. 2. Take of—

1. Moosumber,	Tolahs	6
2. Dikkamullee,	ditto	6
3. Kullee Jeerah,	ditto	6
4. Googul,	ditto	6
5. Ulleem,	ditto	6
6. Morethootha,	ditto	1
7. Urthal,	ditto	2
8. Afeeme,	ditto	1

Pulverize the hard substances separately, add as much of the juice of the Asclepias, (or Mudar) as will form the whole into a mass and keep a couple of days in a new chatty, the mouth of which to be closed air-tight, then make into pills about the size of marbles, which are to be dried in the shade and preserved for use. Two are a dose for a large Elephant, and one for a small. Previously to their use to be put into hot charcoal ashes, then to be rolled up in grass with some jaggery and given when the disease appears, which may be repeated as often as need be.

MUSSALLAS FOR PET-KA-DURRUD.

No. 1. Take of—

1. Gumbeede,	Tolahs	6
2. Judherjoathe,	ditto	6
3. Muddode pulbe,	ditto	3
4. Sohagah,	ditto	6
5. Googul,	ditto	3
6. Butchnaag,	ditto	6
7. Koochlay,	ditto	6
8. Butche,	Seers Cutcha	1
9. Lussoon Kaboosa,	ditto	1
10. Aak-ka-pool,	ditto	1
10. Hing,	Tolahs	6
12. Wie Combah,	ditto	6
13. Moosumbur,	ditto	6
14. Gudy kaka Charoole,	ditto	6
15. Gumbeeda,	ditto	6
16. Dakka Chahl,	Seer	1
17. Beelamay,	Tolahs	6
18. Dek-kamulla,	ditto	6
19. Ghoode,	Seer	1

Pulverize the hard substances, and bruise the others and mix, then form into boluses about the size of a small lime, one of which is to be given every

evening, continue for 10 days and afterwards till health be restored if any improvement occur, if not give the following:

No. 2. Take of—

1. Maendpul ka Chahl,	Seer	1
2. Uldaka chahl,	ditto	1
3. Aokka chahl,	ditto	1
4. Bamawaal,	ditto	1
5. Gunbeede,	Tolahs	6
6. Laull Meerchee,	ditto	12
7. Rayan,	ditto	6
8. Sohagah-ka-killee,	ditto	3
9. Hing,	ditto	3
10. Ujawan,	Tolas	6
11. Koorasanee Ujwan,	ditto	6
12. Usmoodha Ujwan,	ditto	6
13. Chooree Ujwan,	ditto	6
14. Ghoondh,	ditto	6

Powder separately the above ingredients, and fry them separately in Jingili oil, then mix and put into a chatty to preserve, and give about the size of a lime every evening. If no improvement after ten days, give the following:

MUSSALLAS FOR WIEGOLLAH.

No. 2. Take of—

1. Teekrejahd,	Seer	1
2. Aakkaghonka Chahle,	ditto	1
3. Usgunka Chahl,	ditto	1
4. Datoora-ka-jahd,	Tolahs	12
5. Saull Cunneer kajahd,	ditto	12
6. Biscoprah-ka-jahd,	Seer	1
7. Mogree-ka-jahd,	Tolahs	12
8. Chumpa-ka-jahd,	Seer	1
9. Beelamay,	ditto	1
10. Gudj-ka Charoolee,	Tolahs	12

The above to be fried together in Jingili oil, to be then put in a chatty, and one pice weight to be given every evening.

ANOTHER FOR WIEGOLLAH.

No. 2. Take of—

1. Ujwan,	Tolahs	2
2. Korasanee Ujwan,	ditto	2

3.	Usmoodha Ujwan,	Tolahs	2
4.	Choree Ujwan,	ditto	3
5.	Butchnaag,	ditto	2
6.	Moosumbur,	ditto	2
7.	Sohagah,	ditto	2
8.	Gunbeede,	ditto	2
9.	Koochlay,	ditto	2
10.	Beelamay,	ditto	2
11.	Vie Comlah,	ditto	2
12.	Bacbadung,	ditto	2
13.	Nurcoghoor,	ditto	2
14.	Hing,	ditto	1
15.	Afeeme,	ditto	1
16.	Mulwagee Afeeme,	ditto	1
17.	Pullas Puppada,	ditto	2
18.	Ambee Ulbed,	ditto	2
19.	Kalee Jeerah,	ditto	2
20.	Hura Googul,	ditto	3
21.	Gudjka Charoobe,	ditto	21
22.	Sheeraafe,	ditto	42
23.	Goode,	ditto	42

The whole to be powdered into a mass with the spirits and kept in a chatty and a large lime sized bolus to be given once daily either morning or evening—a marble sized bolus to be given for a small Elephant.

MUSSALLAS FOR WIEGOLLAH.

No. 3. Take of—

1.	Urthal Workee,	Tolahs	1
2.	Gundugh,	ditto	1
3.	Lohut,	ditto	4

Powder the above well and mix with lime juice so as to form a mass, and to be divided into pills about the size of a marble. Put a pill in two leaves of the Aakkaputtah one above and one below, it is then to be buried for a quarter of an hour in hot wood ashes. The leaves are then to be taken out and given every evening after the ratib.

MUSSALLAS FOR WIEGOLLAH OR DHOOBLA.

Take of—

1.	Nukkolah,	Tolahs	½
2.	Nagooree Usgun,	ditto	½
3.	Ahthees,	ditto	½

4. Geong Allah,	Tolahs	½
5. Butchnaag,	ditto	½
6. Kaghoor,	ditto	½
7. Kalabutchwa,	ditto	½
8. Neerkajhoor,	ditto	½
9. Heerbesee,	ditto	½
10. Neerbesee,	ditto	½
11. Afeeme,	ditto	½
12. Hing,	ditto	½
13. Googul,	ditto	½
14. Kapeelah,	ditto	½
15. Ambee Ullud,	ditto	½
16. Shemroafe,	ditto	½
17. Russchendoor,	ditto	½
18. Moordhur Singh,	ditto	½
19. Munseel,	ditto	½
20. Urthal,	ditto	½
21. Gunheede,	ditto	½
22. Geougkacttlah,	Seer	1

Powder all the hard substances and add as much Arrack as will form the whole into a mass, and to be divided into pills about the size of a marble, one to be given every evening after ratibe and water. If Ahthees can be procured leave out the Butchnaag and retain it. The two are incompatible and would occasion sickness.

MUSSALLAS FOR THE EYE.

Unjun or Opacity.

No. 1. Take of—

1. Zunghar,	Tolahs	1
2. Pupped Khar,	ditto	1
3. Coradee,	ditto	1
4. Sunke,	ditto	1

The two last 3 and 4 to be well powdered and sifted, and add the ingredients 1 and 2. The juice of five limes to be then added to convert the whole into a consistence of paste, when it is to be spread on cloth and dried, the cloth is then to be rolled up to preserve the medicine on it, and when required, the necessary quantity is to be softened by adding lime juice, and put into the eye, or rather between the ball and eyelid. To be inserted morning and evening for ten or twelve days.

No. 2. Take of—

1. Afeeme,	Tolahs	2
2. Puttakdee,	ditto	2
3. Morethoatha,	ditto	1
4. Saboon,	ditto	2
5. Kulcopree,	ditto	2
6. Sohagah,	ditto	2
7. Kabe Sudjhee,	ditto	2
8. Sendalone,	ditto	1
9. Lawong,	ditto	1
10. Zemghar,	ditto	2
11. Nowsaggur,	ditto	2
12. Kamonee-ka-russ,	ditto	21
13. Koopee-ka-russ,	ditto	21

Powder the whole, except the two last, then mix and add the ingredients 12 and 13. Then rub together for a day and a half, keep in a copper vessel. When required a small quantity to be inserted in the eye.

No. 3. Take of—

1. Nowsaggur,	Tolahs	1
2. Mohthee,	ditto	1
3. Kulcopree,	ditto	1
4. Zungar,	ditto	1
5. Purgahnee,	ditto	1
6. Nimboo,	No.	15
7. Pullool-ka-thael,	sufficient quantity.	

Pulverize the ingredients 1, 2, 3, 4 and 5, and mix, adding the juice of the limes and oil. Rub up in a brass vessel, then preserve in a copper one, use as above after inserting, and if free lachrymation exists, throw on the eye and surrounding parts, some cold water, to moderate the effect of the ointment. The above will always cure Opacity completely.

MUSSALLAS FOR VASCULARITY OF THE CONJUNCTIVE OR OPHTHALMIA, CALLED CHEETA.

No. 1. Take of—

1. Kulcopree,	Tolahs	1
2. Thahd-ka Misceree,	ditto	6

Pulverize, and put the ingredients in a new chatty, with two seers of water and a small quantity of Coriander Seed. To be let to stand over night and then boil. The wood used for burning to be of one kind ; any may be

used: boil down to ¾ of a seer, (the chatty being all the while covered with a flat chatty, which is to be joined with mud.) The cover to be taken off and left to cool; use a desert spoonful to be put in the eyes morning and evening on alternate days; during the intervening days either Goats or Cows' milk is to be put in the eyes.

To be used till the eyes are well.

FOR OPACITY AND LACHRYMATION WITH INFLAMMATION, CALLED LEEP.

No. 1. Take of—

1. Summunderpul,	Tolahs	½
2. Chibbeenj,	ditto	½
3. Chowal doedso pahnee,	ditto	½

Mix together to form an ointment, which is to be rubbed around the eye, (not to be inserted) after the application, a lighted batty is to be held near till it is dry; but so far burnt as not to give smoke, when this is being used around the eye, the "*Cheeta*" is to be applied inside the eye.

No. 2. Take of—

1. Kulcopree,	Tolahs	2
2. Puttukdee,	ditto	2
3. Kaephul,	ditto	5
4. Morethootha,	Grs. weight	20
5. Misseeree,	Tolah	1
6. Nowsaggur,	ditto	1
7. Laong,	Grs. weight	2
8. Puttanee loodth,	Tolah	1
9. Patinee,	Pucca seers	2½

Pulverize or bruise the above, and put in water and boil down to half seer. Cool and strain, and keep in a bottle well corked; about a tea spoonful to be put in the eyes twice or thrice daily.

No. 3. Take of—

1. Puttakdee,	Tolahs	3
2. Morethootha,	ditto	1½
3. Aakkadoodth,	ditto	6

Pulverize the ingredients 1 and 2, then mix with the above milk, put in a small chatty and boil a few minutes and allow to cool. Then boil in

another vessel 12 tolahs of water and about the size of a tamarind seed of this mixture and boil down to a quarter of a seer, then cool and apply daily to eyes.

The vessel to be kept covered.

MUSSALLAS FOR BUMBNEE.

No. 1. Take of—

1. Misseeree,	Tolah	1
2. Sendelone,	ditto	1
3. Kulcapree,	ditto	1
4. Morethootha,	ditto	1
5. Puttukdee,	ditto	1
6. Sombree lone,	ditto	1
7. Nowsaggur,	ditto	½
8. Zungar,	ditto	½
9. Shorah,	ditto	1

Pulverize the ingredients. Put two pucka seers of water in a copper vessel and add the powdered ingredients, then boil down to ¾ seer and let cool—apply in convenient quantity twice or thrice daily.

MUSSALLAS FOR BUMBOODE.

No. 1. Take of—

1. Jungalee Seekakar,	Tolahs	2½
2. Chickna Suparee,	ditto	2½
3. Beelamay,	ditto	2½

Burn these ingredients, then pulverize and mix them, wash the affected part and sprinkle with the powder.

No. 2. Take of—

1. Moordhar Singh,	Tolahs	1¼
2. Googul,	ditto	1¼

Pulverize and mix with a small quantity of ghee to form an ointment and apply.

No. 3. Take of—

1. Saboon, ... Tolahs 1¼
2. Sohagah, ... ditto 1¼
3. Kalcapree, ... ditto 1¼

Grind the above ingredients together, mix with honey and apply.

No. 4. Take of—

1. Butche, ... Tolahs 2

Burn the sweet flag and powder. Then apply—

No. 5. Take of—

Lussoon, ... A whole root.

Fry in ghee and apply.

A Catalogue of the Substances prescribed in the Diseases of the Elephant.

Hindoostanee Names in English Character.	Hindoostanee Names in Persian Character.	English Names.	Tamul Names in English Character.	Medicinal Qualities.	Quantities for a dose in Tolah Weight.	Remarks.
Ambee Ullud, ...	.....	Colored Turmerick, ...	Rostoonee Munjah, ...	Stimulant, ...	1 to 6	
Afeeme, ...	.....	Opium, ...	Abinee, ...	Stimulant and Narcotic,	1¼ to 1½	
Awalguntee, ...	.....	Dried Gooseberries, ...	Nellee Rae, ...	Cooling, ...	3 to 24	
Awalsa Gundugh, ...	.....	Sulphur Sublimed, ...	Nilla Gindagum, ...	Stimulant, ...	1 to 4	
Aukkapool, ...	.....	Oleander Flowers,.....	Yarrakum poo,.....	Ditto, ...	4 to 26	
Ahthees, ...	.....	.....	.....	.....	¼ to 2	
Akka chal, ...	.....	Oleander Bark, ...	Yarrakum puttay,.....	Tonic and Anodyne,...	1 to 6	
Amulthas, ...	.....	Cassia Fruit, ...	Konakac, ...	Stimulant,.....	6 to 34	
Beemamah.						
Beelamay, ...	.....	Marking Nut, ...	Seeran Chattay, ...	Stimulant and Tonic, exactly astringent,	2 to 12	
Bahl uldah, ...	.....	Small Ink Nut, ...	Shinna Cadookae,.....	Exty. Detergent, ...	1 to 4	
Butche, ...	.....	Sweet Flag, ...	Vasumboo,.....	Stimulant and Carminative, ...	3 to 24	
Butchnagg, ...	.....	....	.....	Stimulant & Narcotic,	1 to 4	
Bhunglumrosah, ...	.....	.....	.....	Stimulant, ...	1 to 6	
Bhaug bunnosah, ...	.....	.....	.....	Stimulant, ...	1 to 6	
Bhur bunnoosah, ...	... .	.....	.....	Ditto, ...	1 to 6	
Biscoprah, ...	.....	.....	.....	Ditto, ...	1 to 8	
Baebadung, ...	.....	.....	Vacbadimgum, ...	Stimulant and Tonic,	3 to 24	
Cavoday kacheckean, ...	.....	.....	.....	Tonic, ...	1¼ to 1	
Cadeekahr, ...	.....	Nitrate of Silver, ...	Camdekarum, ...	Escharotic, ...	1¼ to 1	
Chilbeenj or Neerbesee,.	.....	.....	.....	Stimulant, ...	1 to 6	
Carasanee Ujwan, ...	.....	Black Henbane, ...	Carosanice Oomum,...	Cooling and Carminative, ...	4 to 24	

Hindoostanee Names in English Character.	Hindoostanee Names in Persian Character.	English Names.	Tamul Names in English Character.	Medicinal Qualities.	Quantities for a dose in Tolah Weight.	Remarks.
Chooree Ujwan, ...	.....	.....	.....	Cooling, ...	4 to 24	
Cubbaub Sinnee, ...	.....	Jungle Cloves, ...	Chitthoo Maligun, ...	Ditto, ...	1 to 6	
Chinneagohndth, ...	.....	Gum Arabic, ...	Pisheenee, ...	Tonic, ...	4 to 24	
Culnahr, ...	.....	.....	Culnahr, ...	Cooling, exty. detergent, ...	1 to 6	
Cowdee, ...	.....	Cowries, ...	Cowdee, ...	Exty. Exchartic & Detergent, ...	¼ to 1	
Chickna Suparee, ...	.....	Nuts (used in beetle)	Culbe Pauk, ...	Astringent, ...	3 to 24	
Dikkamullee, ...	.....	.....	Cumbbe Pooshawum,	Stinct. & Authehmatic,	4 to 30	
Dareeaka Coprah, ...	.....	Sea Cocoanut, ...	Samoodra Thaengae,	Cooling & Astringent, ...	1 to 6	
Domka Meerchee, ...	.....	Cubebs, ...	Vail Meloogoo, ...	Tonic, ...	4 to 24	
Dhal Chinnee, ...	.....	Cinnamon Bark, ...	Savungor Kottay, ...	Cooling, ...	4 to 20	
Dhatoora, ...	.....	Thorn Apple, ...	Oomatha kae, ...	Stimulant, ...	1¼ to 4	
Dunngah, ...	....	Coriander Seeds, ...	Kothamullic, ...	Cooling, ...	3 to 16	
Dûhee, ...	.....	Butter Milk or Tyer,	Thyer, ...	Ditto, ...	10 to 80	
Daaooday kapool, ...	.....	.....	.....	Stimulant, ...	1 to 6	
Elaachee, ...	.....	Cardamom Seeds, ...	Yalam, ...	Cooling, ...	2 to 12	
Erundee ka Thael, ...	.....	Castor Oil, ...	Sithamoonuk Urmay,	Purgative and Cooling, .	4 to 16	
Ditto ditto Coplean, ...	.....	Castor Seeds, ...	Sithamoonuk Cattay,	Cooling and Tonic, ...	6 to 18	
Eera ka Sheesh, ...	.....	.....	.....	Tonic, ...	1 to 6	
Gundugh, ...	.....	Sulphur, ...	Gurdagum, ...	Stimulant, ...	2 to 10	
Géooh ka-attah, ...	.....	Wheat Flour, ...	Godoomic Maoo, ...	Nutritive, ...	6 to 30	
Gotee Suparee, ...	.....	.....	.....	Stimulant and Detergent, ...	1 to 6	
Geong Allah, ...	.....	Orange Fruit, ...	Kitcheelie pullum, ...	Cooling and Tonic, ...	1 to 10	
Gudy ka, ...	.....	Grey Bondue Nut, ...	Gudg kae, ...	Stimulant, ...	2 to 15	

Gunbeede,				Cooling and Tonic,	6	to	34
Goor,		Jaggery,	Vaelum,	Tonic and Stimulant,	4	to	36
Googhul,		Dammer,	Koongilbrum,	Stimulant and Tonic,	2	to	10
Gudgekaka Charooh,		Grey Bondue Seed,	Gudge Kae Varay,	Stimulant, Tonic and Anthel,	2	to	24
Keerbesice,			Thathum Cottay,	Stimulant and Tonic,	1	to	8
Hing,		Assafœtida,	Perungaqum,	Stimulant, Antisip and Carminative,	1	to	8
Imwarka Chahl,				Tonic,	3	to	24
Indrayen,		Bitter Cucumber,	Pey Koorunootee kae,	Tonic and Stimulant,	3	to	24
Inghun,				Stimulant,	3	to	24
Judherjoothe,			Vappaul Arisie,	Stimulant and Carminative,	1	to	4
Jughen ka Chal,				Stimulant and Tonic,	4	to	30
Jafful,		Nutmeg,	Jadeekae,	Stimulant and Carminative,	1	to	4
Juttah Mahs,		Cyprus Junice folius,		Stimulant	1	to	6
Jungalee Seeka Kae,			Catoo Seckakaree,	Exty. Astring. and Detergent,	1	to	4
Kakindsinghee,		Ink Nut Flowers,	Kadookae Poosphum,	Exty. Detergent,	1	to	12
Kakinareekaheing,		Coculus Indicus,	Oathanang Varay,	Tonic,	1	to	6
Kaephul,				Tonic and Stimulant,	2	to	10
Kutth,		Catechu,	Casie Coatie,	Astringent,	2	to	24
Khost,		Arabian Castus,	Coastitum,	Stimulant,	1	to	12
Kala bohle,		Myrrh,	Kareeabohlum,	Stim. Antist. & Emmery,	1	to	6
Koochilay,		Poison Nuts,	Yettee Varay,	Stimulant & Narcotic,	1	to	6
Kooghul,		Bdellium,	Koogule,	Stimulant,	2	to	24
Kootkee,		Black Hellebore,	Kadoogooroganee,	Ditto,	3	to	30
Koghoor,		Carrot Root,	Karrut Kalungoo,	Tonic,	4	to	32
Kala butchua,			Putchanaorie,	Stimulant & Narcotic,	1	to	3

Hindoostanee Names in English Character.	Hindoostanee Names in Persian Character.	English Names.	Tamul Names in English Character.	Medicinal Qualities.	Quantities for a dose in Tolah Weight.	Remarks.
Kalie Judghee, ...	.....	.....	.....	Tonic,.....	3 to 30	
„ Jeerah, ...	.....	Black Pepper,.....	Kariean Seeragum, ...	Stimulant and Tonic,...	2 to 30	
Kullee ka Choonah, ...	.....	Lime Stone, ...	Choonamboo Kalloo, ...	Cooling, ...	1 to 6	
Kuppeelah, ...	.....	.....	.....	Stimulant, ...	1 to 6	
Kulcapree, ...	.....	.....	....	Stimulant and Detergent, ...	1 to 6	
Kamonee ka Russ,.....	.....	.....	Munnatha Kullie, ...	Tonic and Detergent,	3 to 24	
Koopee, ...	.....	.....	Coopaminnee, ...	Stimulant and Detergent, ...	3 to 24	
Laong,.....	.....	Cloves, ...	Lavengum, ...	Stimulant and Carminative, ...	1 to 6	
Lussoon, ...	.....	Garlick, ...	Velli poondoo,.....	Stimulant, ...	6 to 40	
Laull Meerchee,.....	.....	Capsicum or Chillies,	Molagae, ...	Stimulant and Tonic,	10 to 80	
„ Cunneer, ...	.....	.....	.....	Stimulant and Narcotic,	1 to 6	
Muta Lukdee,.....	.....	Liquorice Root, ...	Adumoodrum, ...	Cooling and Tonic, ...	1 to 12	
Munseel,.....	.....	Red Orpiment, ...	Manooselay, ...	Stimulant, ...	1 to 6	
Morethotha, ...	.....	Blue Vitriol, ...	Mail Thoothum, ...	Exty. Exhart and Detergent, ...	1 to 3	
Mahpul, ...	.....	Galls, ...	Masheekae, ...	Antiseptic,.....	1 to 6	
Muddode pullee,.....	.....	Screw Tree,.....	Valumboo Viree Kae,...	Tonic, ...	2 to 24	
Moongay ka Chal, ...	.....	Horse Radish Root,	Moorungayputtay, ...	Ditto,.....	2 to 24	
Moordhur Sung, ...	.....	Litharge, ...	Moordhar Singhie,.....	Stimulant, ...	1 to 8	
Moosumbur, ...	.....	Aloes, ...	Moosambrum, ...	Alterat. Purgat. and Stimulant, ...	4 to 30	
Meeta Tail,.....	.....	Jingili Oil, ...	Nulla Unnay, ...	Cooling,...	10 to 40	
Misuree, ...	.....	Sugar Candy, ...	Culkoondoo, ...	Ditto,.....	6 to 40	

Mahl Kungnee, ...	.....	.....	.....	Stimulant and Tonic,	3	to	24
Maendkee, ...	.....	.....	.....	Ditto, ...	1	to	6
Maendpulka Chal, ...	.....	.....	.....	Ditto, ...	3	to	18
Mohoy ka Chal, ...	.....	.....	.....	Tonic, ...	2	to	24
Mohthee, ...	.....	Pearls, ...	Nelta Mootoo, ...	Excharotic and Detergent, ...	¼	to	1
Nagooree Usgun, ...	.....	Physalis Fleruosa, ...	.....	Stimulant, ...	2	to	20
Naggur Mootha, ...	.....	Cyprus Junice folius,..	Karay Kalungoo, ...	Ditto, ...	1	to	12
Nhag Chumpah, ...	.....	....	.....	Tonic and Alterative,	3	to	24
Nurkachoor, ...	.....	.....	.....	Stimulant and Tonic,	1	to	12
Neemboo, ...	.....	Limes, ...	Yellinuchumpullun, ...	Cooling, ...	5	to	40
Nukholah, ...	.....	.....	.....	Tonic and Stimulant,	1	to	12
Nowsoggur, ...	.....	Sal Ammoniac, ...	Nowsaggarum, ...	Cooling and Detergent,	1	to	8
Nackaputtha, ...	.....	.....	.....	Tonic, ...	3	to	24
Oodth, ...	.....	Benjamin, ...	Sambranee, ...	Exty. Detergent, ...	2	to	12
Oodooth ka-Attah, ...	.....	A species of black Gram, ...	Ooloondhoo Maoo, ...	Tonic and Nutritive,	5	to	40
Parah, ...	.....	Quicksilver, ...	Putchay Russum, ...	Stimulant, ...	1	to	6
Puppud Kahr, ...	.....	Pelitory Root, ...	Upplakarum, ...	Stna Exty. Escharotic,	1	to	6
Pinghanee, ...	.....	China plate, ...	Cheena Pingour	Stimulant and Detergent, ...	¼	to	1
Pipplean, ...	.....	Long Pepper, ...	Thipplie, ...	Stimulant and Tonic,	3	to	18
„ Mohde, ...	.....	.....	Mohdee, ...	Ditto, ...	4	to	18
Pullas Puppada, ...	.....	Seed of Butea Frondosa, or Dakh, ...	Poorooshin Vinee, ...	Stimulant and Tonic,...	2	to	24
Pullool ka Thail, ...	.....	.....	.....	Tonic, Stimulant and Carminative, ...	4	to	24
Puttakoee, ...	.....	Alum, ...	Puddikarum, ...	Tonic and Astringent,	1	to	4
Peeahz, ...	.....	Onions, ...	Vengayum, ...	Stimulant and Tonic,...	10	to	100
Puttanee Loodth, ...	.....	Canella Bark, ...	Caleevrum Puttay, ...	Cooling and Tonic, ...	1	to	6
Russ Chendoor, ...	.....	Red Lead, ...	Russu Chendoorum, ...	Stimulant, ...	1	to	4

Hindoostanee Names in English Character.	Hindoostanee Names in Persian Character.	English Names.	Tamul Names. in English Character.	Medicinal Qualities.	Quantities for a dose in Tolah Weight.	Remarks.
Ruyan,		Mustard,	Kadoogoo,	Stimulant,	2 to 12	
Reeshumka Kuppada,		Silk Cloth,	Putto Thonee,	Stimulant,	1 to 6	
Sungjeerah,			Culnahr,	Cooling, Exty. Detergent,	1 to 12	
Sendalone,		White Rock Salt,	Judhoopoo,	Cooling, Alterat. and Tonic,	4 to 24	
Suffadhe Soomul, or Soomal Khar,		White Oxide of Arsenic,	Velbee poshomun,	Stimulant and Tonic,	1 to 4	
Ditto Thootha,		Zinc or white Vitriol,	Villie Thoothoonagum,	Tonic, Exty. Detergent,	1 to 2	
Ditto Chinnee,				Stimulant,	1 to 3	
Ditto Jeerah,		Cummin Seeds,	Seer agum,	Cooling and Tonic,	3 to 16	
Sohagah,		Borax,	Velligarum,	Stimulant and Tonic,	2 to 8	
Suhufe,		Anise Seeds,	Somboo,	Cooling and Tonic,	4 to 18	
Shemroofe,		Vermillion,	Judhielingum,	Stimulant,	1 to 3	
Sooke Muchee,		Dried Salt Fish,	Onundha Meena,	Tonic,	1 to 6	
Shrab,		Arrack,	Charugumor Puttay,	Stimulant,	1 to 3 bottles.	
Sunke,		Large Sea Shells,	Surkoo,	Exty. Detergent,	¼ to 1	
Saboone,		Country Soap,	Sowearum,	Ditto,	1 to 6	
Surunderpul,				Tonic, Inty. and Detergent externally,	1 to 6	
Sundalay ka jahd,				Tonic,	4 to 24	
Sambree lone,				Astringent,	1 to 6	
Sayudth ka Chaplean,		Euphorbium,	Suddra Kuller,	Tonic,	1 to 12	
Shorah,		Saltpetre,	Pottle Ooppoo,	Cooling, Detergent,	1 to 6	
Soourka Ghee,		Swine's fat,	Punnee Coloopoo,	Tonic and Stimulant,	3 to 24	
Sohut,		Dried Ginger,	Chookoo,	Cooling, Corment. and Stimulant,	4 to 28	

Shahth,		Honey,	Thagen,	Nutritive,	4	to	28
Tabaseer,				Cooling,	2	to	12
Tikree Kujuhd,				Tonic and Cooling,	4	to	28
Thar-ka-Miseeree,		Sugar of Dates,	Pahnum Villum,	Cooling and Detergent,	4	to	24
Ukkul Covah,			Thoombaras tagum,	Stimulant,	2	to	12
Ulleem,		Linseed,	Allee Varry,	Cooling,	2	to	4
Urthal,		Yellow Orpiment,	Urreedahrum,	Stimulant,	1	to	3
Urthal Woorkee,		Gold colored Orpiment,	Ponarridahrum,	Stimulant,	1	to	3
Ujnan,		Bishop'sweed Seeds,	Ajoomoodhoor Ormum,	Carmint. and Cooling,	4	to	24
Usmoodha Ujowan,		Henbane Seeds,	Ajoomoodooh,	Tonic,	4	to	24
Ujjpulkajhd,				Tonic,	4	to	24
Unleaydhee,		Sulphate of Iron,	Unnahaydhee,	Tonic and Stimulant,	1	to	6
Uldah,		Ink Nut,	Kadookai,	Astringent,	1	to	10
Uldhhe,		Saffron,	Murjah,	Stimulant,	3	to	24
Uddaruck,		Green Ginger,	Jujhee,	Stimulant and Carmt.,	4	to	30
Vue Combah,				Stimulant and Tonic,	3	to	24
Zurgee Uldhie,				Tonic and Carmint.,	1	to	6
Zaafra,		Meadow Saffron,	Koongoomapoo,	Stimulant and Carmt.,	1	to	8
Zungalar Zungar,		Verdigrease,	Vengala Putchay	Stimulant and Excort.	1	to	3

OF A MEDICINE CHEST.

A Chest containing Instruments and Medicines for the treatment of diseases and injuries of the Elephant ought to accompany a Force with which that animal is employed.

Of Instruments the following will be useful—

1st. A Veterinary Surgeon's Pocket case of Instruments.

2d. Probes of steel of various length, from a foot to a foot and a half: and from a 20th to a 10th of an inch in diameter—these will be useful in probing abscesses, introducing pledgets, &c.

3d. Knives, for laying open abscesses. The Amputating Knives of a Surgeon's case are of a convenient size for this purpose, but the handles are too weak in consequence of the steel part thereof not extending to the end—this defect may in part be remedied by surrounding the handle throughout its extent with a piece of strong twine tightly rolled round it.

4th. Half a dozen of Knives of the medium size of those belonging to a Surgeon's Amputating case, but with sharp points, for the inspection of carcases of animals which have died of disease.

5th. Needles for bringing together by means of thread, the lips of the wound made in bleeding.

6th. Bolus Knife.

7th. Spatula for spreading plaster.

8th. Pestle and Mortar, one of brass, large size, (6 lbs.) and one of Wedgwood's ware medium size, i. e. 4 lbs.

9th. Scales and Weights.

10th. Crucibles for fomentations, and also a supply for covering the body of the animal when under treatment for fever and other severe internal diseases, which require the surface to be kept warm.

11th. Thirty or forty yards of strong Bandage Cloth.

MEDICINES.

Of these, those of a vegetable kind only need be kept in the Medicine Chest, which are not usually and easily procurable in the fresh state. It ought to contain all of a mineral or animal kind, as what of these two classes of Medicines are procurable in Bazars are frequently of inferior quantity.

It is advisable to have the following:

English Names.	Hindoostanee Names.	English Names.	Hindoostanee Names.
Aloes, ...	Moosumbur.	Cutechu, ...	Kutth.
Alum, ...	Pullukdee.	Cinnamonbark, ...	Dhal Chunnee.
Arabian Castus, ...	Kohst.	Cloves,.....	Laong.
Assafœtida, ...	Hing.	Croton Oil, ...	Jummul Gotah ka-Tél.
Benjamin, ...	Oadth.	Croton Seeds, ...	Jummul Gotah.
Bitter Cucumber, ...	Indrager.	Coriander Seeds, ...	Dunnyah.
Black Hellebor, ...	Kootkee.	Cubebs, ...	Doowka Meerchee.
Blistering Ointment,	Puppolay ka Murhum	Cinnamon Seeds, ...	Suffadhe Jeerah.
Borax, ...	Soagah.	Dammer, ...	Googul.
Calomel, ...	Russumber.	Galls, ...	Mahphul.
Camphor,.....	Capoor.	Ginger, dried,.....	Sohut.
Canella Bark, ...	Puttanuloodth.	Gum Arabic, ...	Chinna Gondth.
Cassia Fruit, ...	Amulthas.	Henbane Seeds, ...	Usmoodha Ujwan.
Cardamoms,.....	Eleachee.	Honey,.....	Shahth.
Ink Nut, ...	Uloah.	Sulphrate of Mercury,	Shumroofe.
Linseed, ...	Ulleem.	Sulphate of Iron,.....	Uahagdhee.
Long Pepper, ...	Peplean.	Ditto of Copper, ...	Murthootha.
Lunar Caustic, ...	Cadeekah.	Sublimed Sulphur, ...	Awalsagundugh.
Marking Nut, ...	Beelamay.	Sulphur, Country, ...	Gundugh.
Meadow Saffron,.....	Zuaffran.	Sal Ammoniac, ...	Noaesaggur.
Mustard, ...	Rayan.	Small Ink Nut, ...	Bohl Ulooh.
Nutmeg, ...	Jufpul.	Sweet Flag,.....	Butchee.
Opium, ...	Afeemee.	Tartar Emetic, ...	.....
Oil of Turpentine, ...	.....	Turmerick, ...	Ambee Ullud.
Poison Nuts, ...	Koochelay.	Verdigrease, ...	Zungar.
Pillitory Root,.....	Puppud Kahr.	Wax, ...	Mome.
Red Lead, ...	Russchendhoor.	White Rock Salt, ...	Sendalone.
Red Orpiment, ...	Munseel.	White Vitriol, ...	Suffadhe Thootha.
Sulphuret of Antimony, ...	Soormah.	Myrrh, ...	Kala bohle.
Sulphuret of Arsenic,	Hurthal.		

PART 4TH.

A GENERAL VIEW OF THE ANATOMY OF THE ANIMAL.

THE following Anatomical notices of the Elephant are of such a kind as is considered sufficient to convey only a general knowledge of the structure of the Animal, and the relative situation of the organs, a minuter description of its organization than this would be attended with no practical advantage, and consequently here, where practical utility is the one object in view would be superfluous, and of a like character would be disquisitions on the functions of the organs, and the laws of their action, the eye of the Elephant is constructed on the same optical principles as that of other land Animals and so of other organs. Those therefore who wish to possess such information have only to consult extant Works in which in reference to other land Animals the Horse, for instance,—these matters are discussed perhaps as useful a work as can be consulted with respect to this object, is the Volume of the Library of Useful Knowledge devoted to the Horse.

Of all parts of the Elephant its skeleton contains the greatest dissimilarity to that of other Public Cattle, whether Horse, Camel or Bullock. On this account as well as the circumstance of the Skeleton of an Animal furnishing definite points of bearing, whence to refer in pointing out the relative position of organs, and also greatly consisting in conveying a general knowledge of the structure of the Animal, I will be somewhat minute in giving a description of that of the Elephant.

Appended is a Sketch of the Skeleton of the Animal filled up at Hoonsoor under my superintendence, and designed to convey to the Mahouts some idea of the structure of the Animal.

A. Is the head, consisting of upper jaw and skull and lower jaw.

B. The bones of the neck of which there are seven. These bones are connected as in other large quadrupeds together by *tendons*, but the latitude of *motion* possessed by each bone on those to which it is attached is not so great in the Elephant as in the Horse, Camel or Bullock, accordingly the general flexibility of the neck of the animal is comparatively of limited degree, accordingly when the animal wishes to observe an object posterior to the direct line of vision at right angles to his body he requires to turn his whole body more or less round.

C. The spinous processes are the basis of the prominent ridge that runs along the top of the back. This ridge consists of these processes, bound together with numerous strong tendinous bands covered only by the skin. Its prominence above the contour of the body exposes it to be pressed on directly by the animal's load if attention be not paid to the condition of the pads, or to their proper adjustment, accordingly it is a frequent seat of inflammation and suppuration as described in Part 1st, page 5.

D. The bones of the tail of which there are twenty-four.

E. The bones of the pelvis or haunch bones. This bone in the Elephant is placed almost perpendicularly, while in the Horse, Bullocks and Camels it is considerably inclined to the horizon.

F. The ribs of which there are nineteen on either side.

G. The breast bone or sternum. To this the ribs are attached, not directly however, as between the sternum and each rib a cartilaginous continuation of the latter is placed. The sternum itself consist of spongy bony substance at its commencement at the neck, but a considerable portion of the other extremity consists of cartilage. The ropes which go beneath the belly to fix on the animal's furniture, and load, bear on the cartilaginous portion of the breast bone.

H. The shoulder bone. This bone has considerable latitude of motion during the movements of the animal, more especially at the upper part, accordingly if due attention be not paid to the adjustment of the pads the skin over this bone is very apt to be inflamed and suppuration follow.

I. The humeros or bone of the arm, which proportionally is much larger in the Elephant than in the Camel, Horse or Bullock.

K. The bones of the fore arm of which there are two, but the one is greatly larger in breadth and thickness than the other. The projection corresponding to the projecting bone at the hinder part of the elbow joint in man is the point on which the animal bears the front part of its body when in the couchant position.

L. The bones of the wrist or carpus of which there are seven in each limb. These bones are the hardest in the body of Elephant. They are firmly braced together by numerous tendons and tendinous expansions.

M. The metacarpal bone or bones corresponding to the bones in the back of the hand of *man*, of which there are five in each extremity of the Elephant.

N. The phalanges are those corresponding to the bones of the fingers in man, of which there are eighteen.

O. The thigh bone or femur. The joint between which, and the pelvis or haunch bone, is in the Elephant of peculiar conformation, in as much as the articulating surface of the thigh bone in this animal is placed on the top of the bone, while with other large quadrupeds it is at the extremity of projection set off from the side. This construction in the Elephant is better adapted for bearing downwards pressure, to meet which in this animal, its enormous weight makes a necessary condition, but it is a construction in which strength is secured at the expense of elasticity and is one cause why the gait of the Elephant is so deficient in this source of comfort to the rider.

P. The bones of the leg, of which there are two in each extremity.

Q. The bones of the tarsus or ankle joint. These are the bones of the wrist or carpus, and are seven in each foot.

R. The bones of the instep or metalarsus, of which in each hinder extremity there are four.

S. The bones of the toes, nine in each hinder limb.

In the construction and distribution of the digestive organs the Elephant and the Horse have much similarity, but in that of their extremities they differ very much, leaving out of consideration the bones in the Horse's legs which, at the pastern, connect the hoof to the legs. The Horse has three bones in his legs : the Elephant has only two, consequently while the latter has only three joints in his extremities the former animal has four. The bones of the carpus and tarsus which in the Elephant are immediately above the foot are in the Horse placed at the knee and the hock. The construction under consideration in the Horse admits of the agreeable pace of this animal, while that of the Elephant admits of only its disagreeable progression, consequently as this is the result of the Anatomical construction of the animal no training can overcome it.

OF THE HEAD.

As might be expected the Elephant differs widely from other animals in the Anatomical construction of the head. It will be attended with some

practical advantages to consider this part of the animal somewhat in detail, more especially to point out the immense extent of the cells which separate the outer bony plate of the skull from the inner. These cells are as already alluded to in page 9, lined with a membrane which occasionally inflame and constitute one variety of the disease, Bhao ka Murz, vide page 9.

The accompanying Sketch No. 2 will assist in forming an idea of the extent of these cells.

A. The outer bony table of the Skull B. the inner between which, C. are the cells, under consideration. They communicate freely with one another, and while their aggregate bulk constitutes a very considerable portion of that of the head so very thin are the long partitions of the cells that a section of the skull through A. A., including the larger portion of them, weighs only 8 lbs. and 9 oz., while the entire skull weighs 108½ lbs. D. is the cavity in which the brain is lodged—this organ in an ordinary sized animal weighs 16½ lbs. In order to shoot the animal in the brain this Sketch shows it is necessary to hit much lower down in the head than might be supposed necessary. The most eligible place is the hollow B. (profile) immediately above the insertion of the trunk at the lower part of the forehead ; the Marksman ought to have a position right in front of the animal, as then the ball will meet with very little impediment but penetrate direct backwards to the brain, a shot directed from the side of the animal is by no means so likely to prove efficient as the numerous tendinous fibres of the muscles at the sides of the head are very apt to occasion the ball to deviate from a direct inward course.

E. The opening of the nostrils, being the continuation of the two canals that traverse the entire length of the trunk.

F. The teeth. The teeth of the Elephant are eight in nunber, 4 in each jaw, the hinder of the two on either side above or below is several times larger than the front ones, the flat grinding surface of each is crossed with lines of hard enamel which extend throughout the substance of the teeth to their roots, about the age of 70 years the front side teeth fall out ; during earlier age they are not subject to disease.

OF THE LUNGS.

These organs in the Elephant as in the other warm blooded animals, are situate in the chest. In the Elephant however this peculiarity obtains with them, that while in other quadrupeds they are separated from the walls of the chest, so that if this is opened the lungs will collapse, in the Elephant they are

throughout their surface which corresponds to the walls of the chest, firmly attached thereto. That this is the normal state of the organ, I satisfied myself by inspection of a newly born animal, which was lately given birth to by a female Elephant caught while in an early stage of the impregnated state in the Coimbatoor jungles. It was the condition uniformly found in six cases I have inspected of full grown animals, but nevertheless the inspection of this new born animal must be considered most conclusive.

The colour of the Elephant's lungs, in the state of health is that of a bright light pink. In other respects the respiratory system of the Elephant resemble other large quadrupeds.

THE SANGUIFEROUS SYSTEM.

The centre of this system, the heart, is in the Elephant situate nearly in the same relative position of the chest as in the same organ—in that of other large quadrupeds, namely, near the lower part of the front above the sternum or breast bone where its pulsations are distinctly to be felt.

The average number of pulsations of the heart of a healthy Elephant is per minute, 44. This is the average result of a great number of trials made to determine the point. The most eligible place for ascertaining the state of the pulse is at the back and root of the ears, where will be seen distinctly a branch of the carotid artery running like a card over the cartilaginous root of the ear, and subsequently ramifying over its surface. Its pulsation will be distinctly felt pressing with the finger. It is not however so easy a matter to determine the exact amount of the pulsations, as the animal when approached by a stranger, and especially in the recumbent position in which it requires to be placed for the purpose, will rarely remain the required time sufficiently quiet. The better way is to cause an intelligent Mahout to count aloud the pulsations while the animal is standing, and when the circulatory system is not disturbed by fear or exertion on the part of the animal.

In disease, the pulse of the Elephant will rise from the healthy standard above named, to 90 or 100 pulsations in a minute. The heart of the Elephant like that of other large quadrupeds is contained in a membranous envelope, called the pericardium, but not attached to it, as are the lungs to the walls of the chest as already alluded to. The heart however is proportionally smaller in the Elephant than in other large quadrupeds, and indeed a peculiarity appertaining to the whole sanguiferous system of the Elephant is its comparative smallness. The aorta immediately at its origin at the heart, is above three inches in diameter, the descending aorta 1½ inch, the carotid

artery in the neck is little more than ½ an inch in diameter, but a still greater disproportion holds both in regard to the number and the size of the veins. There is no external jugular vein, and the internal jugular is smaller than the carotid artery it accompanies. Then in regard to other superficial veins, which are numerous and prominent in the Camel, the Horse and the Bullock, their counterparts in the Elephant are in many instances either wanting altogether, or so small, as seldom to be distinguishable.

This state of things renders the important operation of bleeding, the mode and site for performing which is about to be described, a more difficult operation in regard to the Elephant than with respect to the Camel, the Horse or the Bullock.

THE OPERATION OF BLEEDING.

When the arteries on the back of the ear, by which the state of the pulse is determined are sufficiently large, the operation of bleeding will be most conveniently performed there. The operation is simple enough, and consists in making an incision into the trunk or largest of the arterial branches on the back of the ear in a longitudinal direction, with respect to the vessel, or obliquely across—care must be taken not to cut the artery completely asunder, otherwise the flow of blood in consequence of the retraction of the divided ends will be greatly, if not altogether, obstructed. The instrument to be used is a two edged scalpel or an abscess lancet, of the common Surgical or the Veterinary case. The animal must previously be caused to lie down; it is said it will from fear rise up immediately after the incision; sometimes the blood will flow in a jet, but usually trickles down the ear, and this will not be wondered at when it is understood, that the artery opened will rarely equal the cabbre of a common writing quill. If the animal can after the first incision be got to lie down again, which is usually will do, though it occasionally refuses, the artery of the opposite ear should be opened. The withdrawal of a gallon of blood is an ordinary bleeding—a gallon and a half a full bleeding. When blood cannot be produced in the place above alluded to, in consequence of the smallness of the arteries, search must be made over the trunk, or extremities for a suitable vein. Search will in vain be made in the neck, as in the Elephant there is no external jugular vein, and the internal jugular is at least four inches from the surface, and independently of this is too small for the present purpose. I have tried to bleed from the carotid artery, which as above stated, is about ½ an inch in diameter. It is in close proximity to the jugular vein, and therefore about four inches from the surface. I attempted to reach the artery by means of a trocar furnished with a canula, the instrument with which in the human subject dropsical accumulation of fluid is drawn off, from the cavity off the abdomen. I was in hopes that by leaving the canula or

silver tube of the instrument in question in the artery when some such measures were adopted would defeat the object in view presuming the artery were pierced.

In all attempts however complete failure resulted, arising, as the artery in so large a mass as is the neck, where no guide is afforded to the exact locality from pulsation of the vessel being felt or otherwise the only guide is the relative anatomical distribution of the parts, which is too indefinite to serve any practical purpose, in regard to the operation under consideration.

The most common locality in which a serviceable vein will be found is the inner surface of either of the hinder legs; let a rope be tied around either hinder limb above the knee with some considerable degree of tightness, soon thereafter a swelling will arise on the inner side of the leg, abruptly prominent in regard to the contour of the limb; by means of a strong scalpel make an incision through the skin immediately over this swelling about an inch in length; then the vessel dilated with blood will project in the opening; by means of a two edged scalpel, or an abscess lancet lay this open, when blood will flow freely, but seldom in a jet; it will trickle down the limb accordingly; the animal ought previously to the commencement of the operation to be made to stand on a large piece of leather which will receive the blood and prevent it flowing on the ground, whereby a more correct estimate can be made of the quantity drawn off. After the required quantity of blood has been drawn off the lips of the wound are to be brought together by a superficial stitch; in order to prevent the animal kicking its legs ought to be tied together previously to the commencement of the operation.

The locality just alluded to, will rarely fail to supply an eligible vein for the operation under description; if so however, search must be made elsewhere. Occasionally a large vein will be found above the under part of the sides of the abdomen, frequently a large vein is to be seen on the inner sides of the fore legs, but the proximity of this locality to the trunk of the animal renders it unsafe to operate there, more particularly by a person to whom the animal is a stranger.

MUSCULAR SYSTEM.

The muscular system of the Elephant is peculiar on account of the great amount of tendinous fibre it contains; about the shoulders and on the buttocks, the usual fleshy red muscle is principally to be found, though even there it contains a considerable quantity of tendinous fibre but elsewhere on the sides of the abdomen, the legs, &c. tendinous fibre exists, in equal if not greater degree than the fleshy. The trunk is a singular compound of fleshy

and tendinous fibre. This state of the muscular system is alluded to on account of the practical bearing it has on injuries done to these parts. It is well known that bruises, &c. inflicted on tendinous parts of the human subject, such as the hind feet, are relieved by warm applications, as hot fomentations or poultices, much more efficiently than by cold ones, and experience shows, that the same principle holds good in regard to the Elephant, so therefore, all bruises and inflammations of the carcase of the Elephant ought to be well fomented in the manner pointed out in page 35. By immediate recourse to this measure inflammation will frequently be subdued, which if neglected or otherwise dealt with, will frequently run on to suppuration, and this more or less interferes with the efficiency of the animal.

OF THE CELLULAR SYSTEM.

The cellular system is that which connects the various parts of the animal frame. In man, and in the larger quadrupeds, it is very thin and transparent, and contains in its folds the fatty matter.

This system in the Elephant is proportionally to relative bulk, of much stronger texture, and has more the character of a tendinous structure—another peculiarity of it is the absence of fatty matter; no where throughout the carcase of the Elephant is fat to be found. It would appear as if nature had considered the weight of the Elephant sufficiently ponderous when it combined the essentials of the animal frame without further increasing that weight by a variable secretion of fat. The tendinous character of this system further indicates the utility of hot fomentation in assuaging superficial inflammatory action by what cause soever superinduced. It is this membrane which undergoes the inflammatory and frequently suppurative process from injury inflicted by the direct pressure of the animal's load on its body when from carelessness on the part of the Mahout, or inefficiency in regard to the padding, the animal's burden is thus allowed to press directly on its body.

ORGANS OF GENERATION.

The chief peculiarity of this department is in regard to the male whose testicles are contained within the cavity of the abdomen and are there situated near the kidneys,—of course this position renders the operation of castration impracticable were all other circumstances favorable.

OF THE WEIGHT OF THE CARCASE OF AN ORDINARY SIZED ELEPHANT.

Before closing this part of the Memoir it may be useful to append the result of weighing the carcase of an Elephant, with the view to ascertain

some data whence to form an opinion of the weight of the animal. There appears to me to be misapprehension entertained on the subject, in works on the Natural History of the Elephant published in Europe, in some of which the weight of the animal is certainly overrated. From 6 to 7 thousand pounds in these works is given as the average weight.

In conducting the weighing of the carcase in portions as stated below, every regard was paid to ensure a correct result, and I consider the one given to be within a very few pounds of the exact weight of the living animal.

1840, August 20th and 21st, weighed carcase of a female Elephant in detached parts, which died of Zaarbahd, and found as follow :—

	cwt.	qrs.	lb.			
Head (including brain) which weighed 16½lb....	4	0	22			
Left foreleg, ...	2	2	25			
Right ditto, ...	2	2	14			
Left Shoulder, ...	0	3	18			
Right Shoulder, ...	1	0	7			
Left Hind Leg, ...	2	2	11			
Right Hind Leg, ...	2	3				
Left Ribs, ...	1	1	20½			
Right ditto, ...	2	0	26			
Loins and part of Buttock, ...	3	0	16			
Pelvis, ...	3	1	19½			
Neck, ...	0	3	13			
Breast Bone, ...	0	3	9			
Weight of Carcase, ...				28	3	10
Heart, ...	0	1	14			
Lungs and Diaphragm, ...	0	3	14			
Kidneys,.....	0	0	16			
Intestines (small and large bowel)	2	1	23			
Liver, ...	0	2	20½			
Spleen, ...	0	0	4½			
Stomach, ...	0	3	12			
Weight of Carcase and Organs, ...				34	1	2
Dung weighed, ...	2	1	9			
Water in Bowels & Cavity of Abdomen (about)	2	1	18			
				39	0	1
lb. Avoirdupois, ...				3369		

The dimensions of the Animal were as follows :—

	Feet.	Inch.	
Height,	7	4	
Length from top of Forehead to insertion of Tail,	10	1	
Round Abdomen,	13	8	
Length of small Intestines,	68	0	
Ditto large ditto,	38	3	(106 3)

Skin about $\frac{3}{4}$ of an inch thick to 1 inch, thickest about loins and buttocks.

Depth of Carotid Artery from surface of neck 4 inches, diameter of Carotid Artery $\frac{3}{4}$ inch.

Jugular Vein in close proximity to Carotid Artery about $\frac{1}{2}$ inch.

The Aorta before ramification, close to Heart, diameter.

The dimensions of the animal taken while alive, will shew the carcase thus weighed, piecemeal, was of more than average size.

(Signed) W. GILCHRIST,

Assistant Surgeon Public Cattle Depot.

HOONSOOR, 20TH NOVEMBER, 1840.

G. H. Huttmann, Bengal Military Orphan Press.