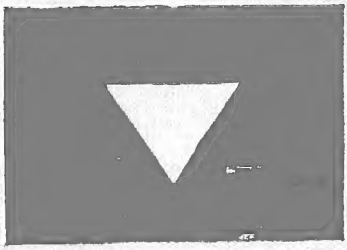

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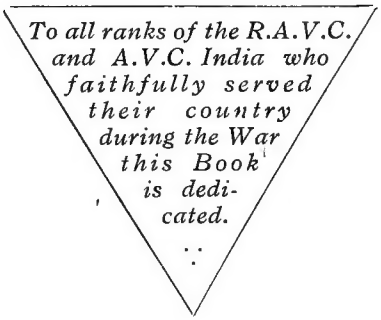

"Moreover it is required in Stewards that a man may be found faithful."

(1 Cor. IV., 2)

The proceeds of the Sale of this Book, after the cost of publication, will be devoted to the foundation of a Benevolent Fund for the personnel of the Army Veterinary Corps, India.

ARMY VETERINARY SERVICE IN WAR

BY

MAJOR-GENERAL SIR JOHN MOORE

K.C.M.G., C.B., F.R.C.V.S.

ARMY VETERINARY SERVICE

DIRECTOR OF VETERINARY SERVICES IN INDIA AND LATE DIRECTOR OF VETERINARY SERVICES BRITISH EXPEDITIONARY FORCE, FRANCE, 1914-19.

WITH A NOTE BY

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Commander-in-Chief in India

LONDON:

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1921

PART III.

ARMY VETERINARY SERVICE AS AN INSTRUCTIONAL AGENCY.

PART IV.

THE MERITS AND DEMERITS OF THE VARIOUS BREEDS OF ANIMALS USED IN WAR.

PART V.

ECONOMY TO BE EFFECTED IN THE DISPOSAL OF ANIMALS WASTED BY WAR.

PART VI.

EXTRACTS FROM OFFICIAL DESPATCHES.

ILLUSTRATIONS.

SIMLA

The Striking power of
an Army & its capability
of inflicting heavy blows
on an unexpected enemy
is greatly dependent
on the Suitability and
health of the animals
employed —

It is hoped that
the Articles written by

Major Gen Sir John
Moore KCB in India
which The United Service
Institution of India
has kindly permitted
to be published in
Book Form will add
in that all important

task which devolves
on us in preserving
their health & efficiency
and their enlightened
treatment when they
are sick —

C C Thomas
for
Cin C Lydia
12 Nov 20.

INTRODUCTION.

I have been asked, by reason of my having held the appointment of Director of Veterinary Services of the British Expeditionary Force, France, during the late War, if I would contribute a series of articles to the Journal of the United Service Institution India on the subject of Veterinary work in War. I am very pleased to accede to the request, for two reasons. Firstly, from an instructional point of view, I feel that, in my present capacity as Director Veterinary Services of the Army in India, it is part of my duty to supply any information which will tend to the advancement and efficiency of the Army in India, and secondly, I desire in every possible way, by precept and by shewing example, to solicit the support of one and all in placing the Army Veterinary Service in India on the same sound basis which it now enjoys at Home, both for Peace and War.

Veterinary Service in India, as it stands at present, is in no way adapted for its success in a War of any big undertaking.

It is a curious mixture of elements seeking the light of day and inviting the process of welding into one common interest and organisation.

Prior to the late War, the personnel of the Army Veterinary Service consisted of 63 officers, Army Veterinary Corps, detailed for a tour of five years by the War Office, and 23 Non-Commissioned Officers of the Unattached List borne on the strength of what was termed the Indian Subordinate Veterinary Corps. These officers were primarily and essentially for the care and treatment of animals of British units. Treatment was carried out in Station Veterinary Hospitals, the personnel for attendance, dressing, grooming, etc., being detailed from units. In Silladar units and Transport, Veterinary attendance was run on regimental lines, Sowars of Silladar Cavalry being sent to the Punjab Veterinary College, Lahore, to graduate after a three years course as Salutries or Veterinary Assistants; those for Transport being engaged locally and departmentally from men

who were College graduates. Only for periodical inspections and on the occasion of outbreaks or apprehended outbreaks of contagious disease were Officers, A.V.C. called in to Silladar Units and Transport. In a few words, the pre-war system was a purely scratch arrangement of borrowing personnel from units for departmental purposes, totally excluding from skilled veterinary care and treatment the great majority of Indian Cavalry, and the whole of the Transport. In war, the whole of the animals comprising a Field Force came under the Army Veterinary Service, and treatment for the most part was centred in Field Veterinary Hospitals specially mobilized. The personnel for these again was obtained under temporary arrangements. It will be seen that a different system was followed in war to what existed in peace, and it will be agreed that such a state of affairs does not commend itself to efficiency, and particularly with a personnel for the most part untrained.

In 1918 an improvement was made. The Government of India sanctioned the transfer of the Veterinary Assistants of Indian Cavalry and Transport to the Veterinary Service, and they were incorporated into the Indian Veterinary Corps. The Cadre strength in Officers of the Royal Army Veterinary Corps was increased from 63 to 95, to admit of the more direct supervision and care of animals. The borrowing of the balance of the necessary personnel, however, still continues, carrying in its train an evil principle of counting men effective in two places for two separate purposes. This is absolutely opposed to *esprit de corps* and truly efficient service.

I have purposely outlined the above Indian system, as I hope to show by contrast in the course of this article what good organization, tempered in the fire of war, really means, and how easy it is for a service well knit, and with its component parts and individual items of personnel knowing its functions and particular duties so well, to undertake anything that a war of any magnitude can produce, where difficulties are but wafer-cakes, and responsibilities become a pleasure. At the same time I should like to mention that there is now under consideration a scheme for the formation of a self-contained Army Veterinary Corps in India which, if it materializes, will place Veterinary Service in that Country on the topmost rung of the

ladder. It would be impossible to find a more promising field or better material wherewith to build an efficient Corps than in India, and it goes without saying that with the experience of the late war fresh in the minds of those in authority, the present moment is most favourable for erecting a sound structure.

To return now more directly to the subject of the article, I propose to divide it into the following headings, and as my experience—or at least the most valuable and up to date part, chiefly relates to the four and a half years' struggle in France and Belgium, I shall have to point my remarks with occurrences in that theatre of war :—

Organization and functions of Army Veterinary Service in War.

Wastage of animals in War.

Army Veterinary Service as an Instructional Agency.

Economy to be effected in the Disposal of animals wasted by War.

The Merits and demerits of the various breeds of animals used in War.

PART I.

Organization and Function of Army Veterinary Service in War.

Chap. I.—GENERAL.

Unquestionably, all administrative services should be separately constituted in peace, with their own fixed establishments; and their inflation to meet the purposes of war should not be at the expense of fighting units, but should be carried out by their own agency.

The Army Veterinary Service at Home—or the Army Veterinary Department as it was then called, learned its lesson of organization during the War in South Africa. Previous to that war there was no properly organized field veterinary system. The old watertight method of regimental treatment existed. In war, ineffectives were sent to the second line transport of their units, taken along with such transport until a favourable time presented itself for their clearance to the Base. The wastage of animals during the South African War was not happy reading, and much suffering, disease, and loss would have been avoided if an efficient chain of veterinary assistance in the field had existed. Strange to say, India, by reason of the experience gained in Frontier Campaigns, was ahead of England in Veterinary Service in those days, and maintained, as it does to-day, Field Veterinary Hospitals or Sections as part of its war organisation. Some of these were sent to South Africa, performed very useful service, and though the personnel was but of a scratch nature, have merited their place as pioneers of Veterinary Service in the Field.

The outcome of the South African War was the creation of an Army Veterinary Corps with its own personnel, and with a Record Office and Depot to carry out transfers, postings, training, etc. Regimental Sick lines in the larger garrisons were re-constructed into Veterinary Hospitals and manned by Army Veterinary Corps personnel. The personnel was grouped into Sections, A.V.C., and these formed the nuclei of Veterinary units in the field. Expansion on first mobilisation was by means of Cavalry reservists, ear-marked as horse-keeper or groom personnel, but subsequently these were obtained by recruitment direct.

The introduction of Mechanical Transport revolutionised the old idea of drafting back ineffective animals to the Second line Transport, and brought about the necessity for suitable means for evacuation, and Mobile Veterinary Sections for this purpose were conceived as a veterinary war measure.

Such progress had Army Veterinary Service at Home made in the year before the late war that it was drawn into staff exercises, and even a few months before the outbreak of hostilities a Veterinary Staff exercise, complete with its administrative Officers, Veterinary Officers in charge of Field units, Mobile Veterinary Sections and Veterinary Hospital arrangements, was successfully carried out at Aldershot on a Scheme arranged by the General Staff.

So that, when the crucial moment of War came, Veterinary Service in the field had more or less a definite policy on which to work, which may be briefly summarised as follows :—

Administrative Vety. Officers with G.H.Q. and I.G.C.
Administrative Vety. Officers with Field Formations.
Executive Vety. Officers with Units and Remount Depots.
An Officer I/C Records at the Base (III Echelon).
Mobile Vety. Sections for evacuation of sick.
Veterinary Hospitals on Lines of Communication.
Base Depots of Veterinary Stores.

The Veterinary units of the original British Expeditionary Force which landed in France during August 1914 comprised:

6 Veterinary Hospitals, each for 250 patients.
11 Mobile Veterinary Sections.
2 Base Depots of Veterinary Stores.

while the entire strength of the A.V.C. personnel numbered :—

122 Officers, Administrative and Executive.

797 Other Ranks.

The total number of horses of the Force was then 53000.

The subsequent record of Veterinary Service, in common with practically all other Branches of the Force, was one of rapid expansion and change of organisation consequent on the growth of the Army and the general evolution of modern warfare. In a little over three years, the above units increased to :—

18 Veterinary Hospitals.
4 Convalescent Horse Depots. } Accommodation for 39800 sick animals.
17 Veterinary Evacuating Stations.
66 Mobile Veterinary Sections.
5 Depots of Veterinary Stores.
1 Bacteriological Laboratory.
7 Horse Carcase Economisers (for By-products).

In addition, Overseas and Dominion Governments supplied :—

2 Veterinary Hospitals (each for 1250 patients).
2 Veterinary Evacuating Stations.
11 Mobile Veterinary Sections.

while the total personnel amounted to :—

	Officers.	*Other Ranks.*
Imperial Vety. Service ...	651	15000
Overseas and Dominion Vety. Services ...	114	1446
Total ...	765	16446

The Canadian, Australian and New Zealand Veterinary Services were modelled exactly on the same lines as the Imperial Service, excepting that they could afford to have more officers for executive duty. They were complete in every item of organisation, even to Veterinary Hospitals on Lines of Communication associated with our own, and there are now in these respective Forces, Officers and other ranks who are thoroughly conversant with the procedure of Veterinary Service, both Administrative and Executive. This is a point to be remembered if ever India requires assistance from our Overseas Dominions and Colonies, in fact I am inclined to think that an association

so happily constituted should be continued, and be transformed into an assimilation or fusion of Service throughout the Empire. If India is by any mischance shut off from the West, there is an efficient field available on her East.

To deal more closely with the subject under review, it will be convenient to divide it under the following headings :—

Administration.
Personnel.
Regimental Veterinary Assistance.
Evacuation of sick and wounded.
Veterinary Hospitals and Convalescent Horse Depots.
Supply and distribution of veterinary equipment and medicines.
Bacteriological Laboratories.

At the outset I desire to pay a tribute of grateful acknowledgement to the constant sympathy and material assistance given by those in authority at General Headquarters, and by General Officers of Commands and Formations, to a Corps which was practically untried in its war organisation. Without such help under circumstances which were difficult, and at times critical, the individual efforts of the Corps itself would have been of little avail to achieve so high a degree of efficiency as was, without doubt, attained during the late war.

CHAP. II.—ADMINISTRATION.

The Army Veterinary Service, being one of the Administrative Services, has a Director as its Head. He in common with other Directors acts under the Q.M.G. of the Force, who is virtually a Chairman of a Board of Directors.

The duties of the Director of Veterinary Services and the location of the Headquarters of his Directorate are laid down in Field Service Regulations, Part II, Sections 22 and 23.

At first the majority of the Directors of the British Expeditionary Force, France, were under the I.G.C., a Deputy Director of each Service being at G.H.Q. with the Q.M.G. This was subsequently altered to Directors being under Q.M.G. direct. So far as the Veterinary Directorate is concerned, the latter disposition and location is the correct one, as the Director having

to administer his service equally at the Front as on L. of C., he can only satisfactorily do it from and through the Headquarters of the Force. Moreover, under a system whereby the Director is back on L. of C. with the I.G.C., and is represented at G.H.Q. by a Deputy, the advice of the Director is exposed to over-ruling by or through his Deputy, and thereby conflict may ensue.

With a Director at G.H.Q. the chain of Administrative Veterinary Organisation is:—

Deputy Directors with each Army, Cavalry Corps and L. of C. (rank of Colonel).

Assistant Directors with each Corps and Cavalry Division. (rank of Lieut.-Colonel).

Deputy Assistant Directors with each Division (rank of Major),

It has been suggested by the After-war-Reorganisation Committee that the A.D.V.S. of a Cavalry Division and the D.A.D.V.S. of a Division should be styled "Commmander," as their duties to a considerable extent are executive. There would appear to me to be very little advantage in the change of designation. The chief duties of these officers are advisory—inspection, supervision, and general direction of Veterinary Services in their Formation, and they are therefore more concerned in administration than in actual command, though the latter is included in the former.

Whether an Administrative Veterinary Officer, A.D.V.S. or D.A.D.V.S., will be required at the Base, or at Base Ports, will depend entirely on local circumstances and requirements. It may also be necessary, as it was in France and will probably be usual in India, to have two Lines of Communication, each requiring an Administrative Veterinary Officer of a status in accordance with other Services.

To assist the Director at G.H.Q. an Assistant Director and a Deputy Assistant Director are necessary, according to the magnitude of the Force.

For the above administrative appointments, clerical establishments are required. In various theatres of war these were Army Service Corps personnel, and were subject to promotion and re-posting within that Corps. This is unsatisfactory to a special technical Service like R.A.V.C. and the proper course is for that Corps to maintain its own clerks, who are trained to its particular requirements.

Chap. III.—PERSONNEL.

To deal with personnel, i.e. maintenance of reinforcements, postings, transfers, and records, a Veterinary Section of the Office of the D.A.G. III Echelon is requisite. A retired Officer, A.V.C., or a Warrant Officer promoted to Commissioned rank is quite suitable for the appointment of Officer in Charge, A.V.C. Records. There is no need to waste the services of a highly technical Veterinary Officer for this duty.

The posting of officers to Formations and the selection of officers for Administrative and Special appointments must in all cases rest with the Director.

The provision of Officers during the late war presented many difficulties on account of the rapid expansion of the Army and the requirements for so many theatres of operation. Establishments of Veterinary Officers with Divisions, Cavalry Brigades and Veterinary Hospitals were reduced to a bare working number of Officers, but the loss in point of numbers was counterbalanced by the experience and the knowledge of duty of those who remained. Added to this, Veterinary Service had a remarkably efficient second string in its Non-Commissioned Officers, both with Field Units and in Veterinary Hospitals and Convalescent Horse Depots on L. of C.

In the early part of this Chapter it was mentioned that on first mobilisation of the Field Veterinary Units with the original Expeditionary Force for France, expansion of A.V.C. was made by Cavalry Reservists for horse-keeper or groom duties. General Headquarters, kindly, and I think with great forethought, permitted the Veterinary Service to retain these men. The majority of them transferred to the Army Veterinary Corps, became Non-commissioned Officers, and together with our own well-trained and proved original Corps N.C.O. became the backbone of the Veterinary Service throughout the war.

To compensate for the reduction of Veterinary Officers in formations, Non-commissioned Officers of the A.V.C. with the temporary rank of sergeant, were attached to Infantry Brigades,

Batteries R.F.A. and R.G.A., Auxiliary Horse Transport Companies, Reserve Parks, Machine Gun Battalions, Sections of Divisional Ammunition Columns, and the Headquarters of Armies and Corps. These "Sergeants, A,V.C." were carefully selected and trained in the use of Vety. equipment and in first aid treatment, The appointments were much sought after, and were filled by men with a good practical experience of horses. They were much appreciated by Commanding Officers of Units and Veterinary Officers, between whom they constituted an efficient liaison. Their good service rendered was not forgotten by Commanding Officers, as was evidenced by the considerable number of rewards which fell to their lot.

Before leaving the "Sergeants, A.V.C." I must tell of one, a retired Officer of the Indian Civil Service, who for over two years, through danger and foul weather, served most gallantly with a Brigade of Guards in this capacity, and whose proud thought to-day is that he served his country as a private soldier.

The majority of A.V.C. personnel employed during the War, with the exception of those with Mobile Veterinary Sections, were either over 41 years of age, or were of a category unfitted for service in the front line. Recruits or transfers, as a rule, had a working knowledge of horses. Their usefulness, however, was not confined to actual attendance on animals. Records of their Civil occupations were kept, and it was quite easy from their number to find skilled and semi-skilled men for any kind of work required, even to that of stable construction, boot repairing, carpentering, tailoring and other duties appertaining to the interior economy of units. Under the Man Power Scheme ("Combing out") 4500 men of A.V.C. in France were transferred to fighting units, and were replaced by men of lower category.

No regularly constituted A.V.C. Reinforcement Depot was established in France. Men were sent out in drafts from the A.V.C. Depot, Woolwich, and they were held on charge of the Veterinary Hospital at the base pending posting. This was more suitable than establishing a separate Depot, as the personnel could be used for hospital purposes pending their allotment to various Veterinary Units. If held by a General Base Depot they would be used for any purpose.

CHAP. IV.—REGIMENTAL VETERINARY ASSISTANCE.

All animals belonging to units within a Formation must be on the Veterinary charge of an Officer of the Veterinary Service. A definite allotment of Veterinary Officers is made to each Formation in accordance with Establishments, and they are attached to the principal or largest units. Veterinary arrangements for the smaller units are made from this allotment by administrative Veterinary Officers of the formation concerned. It is most important that every unit should have proper Veterinary supervision and care, as it is only by this means sickness, inefficiency and diseases of a contagious character can be adequately controlled. It was a practice in the B.E. Force, France, that Veterinary Officers, in addition to their daily routine work, should make a weekly inspection of animals in their charge for contagious diseases, i.e., Glanders, Mange, and Epizootic Lymphangitis, and should certify on their weekly returns of sick and lame that such had been carried out. The bad case of Mange, the "open" case of Glanders, and the advanced case of Epizootic Lymphangitis is usually to be found in a unit that has not, for some reason or other, been under immediate veterinary care. Freedom from disease is in direct relation to the degree of care bestowed on animals, and the spread of mange or any contagious disease is a certain indication of neglect in management and supervisionary care.

It has been suggested by the After War Reorganisation Committee that Veterinary Officers of formations should be pooled under their respective administrative Veterinary Officers. Owing to shortage, which casualties and expansion of an army are apt to produce, recourse to pooling may be forced on one, as happened during the late War, but looking at it from the point of view of an initial system of organisation, provision must be calculated on definite lines of allotment.

It is, moreover, much more satisfactory to units and to Veterinary Officers for the latter to be attached to certain units

of a formation (i.e. the principal units) and that a continuity of service thereby should be maintained. Commanding Officers and Veterinary Officers get used to each other, a spirit of *bon camaraderie* and faithfulness to the unit's interest is engendered, which makes for more efficient service. It often happens that a Director is asked by a Commanding Officer for the return of a Veterinary Officer to his unit after the latter has become a casualty, and a like request often arises from the Veterinary Officer for return to his previous charge.

The following distribution of Veterinary Officers with Field Formations as they are at present constituted is satisfactory, and represents the minimum allotment which can be made without incurring a breakdown in the necessary amount of supervision which all units in a Field Army require:—

Division		**Cavalry Division of 3 Cavalry Brigades**	
D.A.D.V.S.	1		
3 Infantry Brigades, R.E. Units. Machine Gun Cos., &c. ...	1	A.D.V.S. ...	1
		Cav. Dv. Troops ...	1
3 Brigades of R.F.A. at one each	3	Cav. Regiments at one each ...	9
D.A.C.	1	3 Mobile Vety. Sections at one each ...	3
Divisional Train ...	1		
O.C. Mobile Vety. Section	1		
Total ...	8	Total ...	14

Corps		**Army**	
A.D.V.S.	1	D.D.V.S.	1
Corps Troops	1	Army Troops ...	1
Corps Heavy Artillery ...	1	Army Brigades, R.F.A. at one each ...	1
O.C. Vety. Evac. Station ... (Allotted as Army Troops).	1		

Veterinary Officers with Cavalry.

When Cavalry is operating, single regiments are constantly being detached, or if not detached, a Cavalry Brigade may work on an extended front, and the necessity for a Veterinary Officer to each regiment has been shown time after time.

If Cavalry operates as a Corps, say of two or three Cavalry Divisions, it is necessary to add to Corps Headquarters an Administrative Veterinary Officer and an Executive Veterinary Officer for Corps Troops.

Sergeants, R.A.V.C., and Farriers of Units.

Veterinary Officers in charge of units require within those units someone to represent the Veterinary Service, to render first aid, to report sickness to them and to carry out their instructions with regard to treatment or evacuation. In the old or Regular Army this representation was effected by the Farrier Sergeants of units (*i.e.* Squadrons, Batteries, Field Companies R.E., A.S.C. Companies, Infantry Transport Sergeants, etc.), who were sent in peace time to Army Veterinary Schools for instruction; but in units of the new armies, where farriers were not only untrained in veterinary matters, but had enough to do in shoeing animals (their first and essential duty) representation was vested in Sergeants, A.V.C., specially attached under War Establishments in consequence of an enforced reduction in Veterinary Officers. The success of these N.C.O. has already been alluded to, and it is a war measure which has everything to commend it.

Veterinary Assistants.

In India Veterinary representation in units of Indian Cavalry, Mountain Artillery and Transport is by means of Veterinary Assistants of the Indian Veterinary Corps, two Veterinary Assistants being allotted to each Silladar Regiment and each Mule, Bullock and Camel Corps, and one Veterinary Assistant to each Indian Mountain Battery.

Veterinary Aid Post.

The bulk of Transport in India is utilised on Lines of Communication, and a feature of veterinary organisation of the nature of "Veterinary Aid Posts" has been adopted during recent operations at various staging points *en route*. Each Veterinary Aid Post consists of a Veterinary Assistant detailed from a transport unit and one or two "Dressers," with a small amount of veterinary equipment.

Veterinary Equipment with Units.

All units are provided with field veterinary equipment, the scale of which is given in their Mobilisation Store Tables. In the B.E.F., France, the scale was cut down to a very low degree. Replenishment was easily effected from Advancep Depots of veterinary stores. Wastage of equipment was curtailed thereby, and to limit wastage still further, certain equipment was allocated to personnel charge instead of unit charge. The ultimate allotment was :—

Officers Wallet	... 4lb.	... in personal charge.
Officers Chest	... 40lb.	... „ „
Veterinary Wallet	... 7lb.	... in personal charge of Veterinary N.C.O.
Unit Chest	... 25lb.	... on charge units and kept by representatives of Veterinary Service in units, *i.e.*, Sergeants, A.V.C. or farriers of units.

In India the principle is practically the same, but the allotment to units until recently was on too liberal a scale. The supply and distribution of field veterinary equipment will be dealt with more fully later on. It is sufficient to say for the present that the Veterinary Service has given very careful thought to appliances necessary for carrying out successful treatment in the field.

Chap. V.—EVACUATION OF SICK AND WOUNDED.

For a unit to be efficient in the field, it must get rid of its ineffective animals, and have them replaced by fit animals. A policy of retention of sick animals with units in the field not only impedes the mobility of such units, but it absorbs the attention of a proportion of the unit personnel who might otherwise be employed in combatant duties. Only minor cases—say those that would be fit again within seven days, should remain on the fighting strength of units, others should be evacuated to Veterinary Hospitals on Lines of Communication where conditions are more favourable for treatment and rest. The

adoption of this policy has resulted in unparallelled reduction of wastage over that of previous wars, and the hard lot of animals under war conditions has been greatly mitigated by the measure. When we think of the haphazard method pursued during the War in South Afric a where sick and enfeebled animals had to be destroyed because they could not keep up with their unit, were abandoned on the roadside, or dumped at places until they could be collected, our present field method is paradise in contrast.

The Veterinary units specially organised for the clearance of sick and wounded consist of:—

Mobile Veterinary Sections (M.V.S.).
Veterinary evacuating Stations (V.E.S.).

Mobile Veterinary Sections.

These small units and their development, supply an interesting page of history in the Great War. They took the field as L. of C. units with an establishment of one Officer and thirteen other ranks, and their allotment was on the basis of one per Division and one per Cavalry Brigade. They were located at Railheads, and their movements were directed from Headquarters I.G.C.

This might be quite satisfactory with an advancing Force, but when our Troops were retreating and Railheads changed several times daily, it was found impossible to administer them from L. of C. It was a fortunate chance that in the early months of the war some of them were not captured by the enemy. It was soon realised that the only practical way of utilising them was to incorporate them in formations. This was speedily done, though not without difficulty, and their record subsequently as Field units forming part of Divisional and Cavalry Divisional organisation has been one of unqualified success. The original establishment was based on the assumption that it might be possible to hire or impress local civilian labour for conducting duties, but it was soon found that this was impracticable and an altogether unsatisfactory procedure. An increase of A.V.C. Horse-keeper personnel to admit of road or rail conducting parties was then made, and the unit became self-contained in all its arrangements, including its own transport. For the collection of serious cases a horse drawn

ambulance was added as part of the transport and many animals were salved thereby. The English horse ambulance of pre-war days is much too heavy, cumbersome, and with too little road clearance for field work, but a light two-wheeled cattle float as used in France, which can be drawn by one horse, proved very excellent. There yet remains to be devised a suitable horse drawn ambulance as a standard army pattern.

In its function, a Mobile Veterinary Section is not only the centre to which all animals from units of a Division or Cavalry Brigade are sent for evacuation, but at times of stationary warfare, or during periods of inactivity of the formation to which it belongs, it can undertake a certain amount of treatment of the less serious class of cases.

Advanced Collecting Posts.

During offensive operations it was common to throw out Advanced Collecting Posts to act as dressing stations and to receive battle casualties just in rear of fighting line. These posts consisted of a N.C.O. and three or four men of Mobile Vety. Sections, but they did not meet with sufficient success to warrant their adoption as a regular routine measure, for the reason that Mobile Vety. Sections cannot afford to split up their small number of personnel, and moreover battle casualties are never so numerous as might be anticipated.

Corps Mobile Detachments.

With the growth of Corps Troops in the B.E.F., France, it became necessary to provide for the evacuation of casualties from units in the vicinity of Corps Headquarters, and furthermore, as Mobile Veterinary Sections of Divisions were so heavily pressed during the operations on the Somme that they could ill afford to send their men down to Veterinary Hospitals on L. of C. with casualties (including those of Corps Troops) it was considered necessary to interpose some veterinary organisation at or near corps railheads. A certain number of N.C.O. and men from each Mobile Vety. Section of Divisions comprising the corps, supplemented by 20 to 30 privates from a Vety. Hospital L. of C. as required for conducting duties, were grouped at corps railheads under the Vety. Officer Corps Headquarters and termed "Corps Mobile Detachments." The

arrangement was not a success, for the reason that the personnel was constantly subjected to change when Divisions were moved from one Corps to another, so that it was finally decided to replace this temporary scratch arrangement by a properly organised unit of the nature of a Casualty Clearing Station. The result was the incorporation in the veterinary organisation of Veterinary Evacuating Stations, so called to avoid confusion with their counterpart in medical organisation.

Veterinary Evacuating Stations.

These were formed by reducing Mobile Veterinary Sections of divisions by the number of privates originally added to them for conducting duties; also by reducing Veterinary Hospitals on L. of C. The personnel consisted of one officer and 38 other ranks.

They were made Army Troops, and allotted to Corps at the rate of one per Corps. A limited amount of transport only was allotted to them, as they were located in proximity to Corps railhead and movement could be made by rail. They were each provided with a motor horse ambulance—a practically indispensable article of their organisation. These units proved the final and complete link in the chain of evacution of Veterinary Services in France, and indisputably earned their place in the organisation of a great army in war. Mobile Veterinary Sections of Divisions and Cavalry Brigades delivered their casualties to them, and they in turn transported them to Reception Veterinary Hospitals on Lines of Communication.

Channels of Evacuation.

Evacuation from the Field to Lines of Communication is usually carried out by rail or road. In the former case arrangements are made for trucks on returning empty supply trains, between Officers Commanding Mobile Veterinary Sections or Veterinary Evacuating Stations, and the Railway Transport Officer at Railhead. Latterly in France, and particularly when the larger clearing units of Veterinary Evacuating Stations were established, special sick horse trains were arranged at the instance of railway transportation authorities, and were found to be highly satisfactory, both from the point of view of quicker arrival of the sick animals at

CONDITIONS OF SERVICE ON THE WESTERN FRONT.

the Reception Veterinary Hospitals, L. of C., and from a relief of congested traffic conditions inevitable during an offensive period.

At times evacuation by road was the only means possible, and it may be said to be the normal system of clearance in most theatres of war, at least for those animals able to walk.

To conserve the small number of men of evacuating Veterinary units, the expedient of a long rope was adopted, by means of which twenty horses or mules could be transported by three men. The animals were attached to the rope in pairs—one on each side of the rope, a man guiding the leading pair, another at the end of the rope and the third man in the middle. This system of road transportation was greatly practised by both Veterinary and Remount Services during the war.

The value of horse ambulances, either horse-drawn or motor-drawn, for evacuation purposes, need not be further enlarged on. They are indispensable factors. The Veterinary Service in the B.E.F., France, had twenty-six motor horse ambulances, kindly presented by the Royal Society for the Prevention of Cruelty to Animals, and subscribed for by numerous well-wishers of animals at home and in the colonies, at an approximate cost of £30,000. They were designed to carry two animals, and unquestionably they paid for themselves in a very short space of time in the number of animals saved. Their use in war need not be restricted to the conveyance of sick or wounded horses, for there are occasions when it may be necessary to get forward quickly cows for the supply of fresh milk to medical units, or even troops in the fighting line. The latter might particularly apply to India. On one occasion in France a party of Royal Army Veterinary Corps under an officer, and with three motor horse ambulances, cleared a stud of brood mares and foals from a district threatened by the enemy.

Another method of evacuation practised in Flanders was by canal barges. The Veterinary Service there maintained a fleet of five barges drawn by steam tugs. Each barge was fitted up for thirty-two animals, and a very limited number of personnel was required. Starting say at 10 a.m. from the Evacuating Station they would arrive about 4 p.m. at the Reception Veterinary Hospital, and the journey was performed under the

most comfortable and easy circumstances. Unfortunately the enemy destroyed locks on their retreat, and barge work became limited in operation. Barges were also used for transport of sick animals between Havre and Rouen, and from these places to Paris for disposal, railway transportation thereby being relieved.

In transporting sick and enfeebled animals, particularly by train, which during hot seasons of the year is very exhausting, the greatest care must be exercised in watering and feeding *en route*. A Non-Commissioned Officer accompanies each train or road party, and one private per truck (latterly reduced to one per two trucks) is detailed. Rations for men and forage for animals to cover the journey are drawn through the supply officer at railhead. Even though there may be recognised halting places for watering *en route* by rail, the varying circumstances of transit during war make their use uncertain, so that watering arrangements must be self-contained and water carried in the trucks or with the animals in some manner. In France many water carriers were improvised, i.e., empty biscuit tins, petrol tins, etc., but the most satisfactory receptacles were the cartridge cases of large calibre shells. By arrangement with the Ordnance they were transported to the Base by Veterinary Service and made use of as water receptacles for sick animals *en route*. Very excellent rubber containers in canvas cases and of approximately ten gallons capacity were also introduced by Ordnance Service and were held in charge of Veterinary Evacuating Units and Hospitals. In Standing Camp for animals which could not walk to a watering place, petrol tins on a pack saddle, or a Willesden canvas tank, capacity 110 gallons, accurately fitting a limbered General Service Wagon and removable when the wagon was required for usual purposes, was adopted by Mobile Veterinary Sections.

In the matter of equipment and medicines, Evacuating Units are complete according to their mobilisation scale.

All animals evacuated must be accompanied by an Evacuation Roll giving a serial number, a short description, the units to which they belonged, and the reason for which evacuated. The object of this is not only to keep a check on the animals, and thus avoid loss or theft, but as all are tested with mallein for

glanders on arrival at the Reception Veterinary Hospital, any reactors may be referred to the unit at the front and immediate action there taken. It is the practice also to attach a special descriptive label (white for medical cases, green for surgical, and red for mange or other communicable disease) to the head collar, the label being rolled up under the tongue of the buckle.

The designation of the Mobile Veterinary Section or Vety. Evacuating Station and the serial number of the case is stencilled on the quarters of the animal so that identification becomes very easy, The stencils can be easily made from wire in common use.

In conclusion of this Chapter, it is instructive to note that between the 18th August 1914 and 23rd January 1919, over half a million sick and wounded animals were collected and passed through Mobile Veterinary Sections and Veterinary Evacuating Stations in the B.E.F., France, a fact which is sufficient justification for their inclusion in the establishment of an army in the field. Between 2500 and 3500 animals per week were admitted to hospital, the record number, so far as my memory serves me, being 4512. And the organisation was so simple that evacuation proceeded automatically.

Chapter VI.
VETERINARY HOSPITALS.
CONVALESCENT HORSE DEPOTS.

Veterinary Hospitals are Lines of Communication units. Their location is guided by convenience of Railway, Supply Transport, and Remount Services.

Usually, one is placed at the base or bases where main Remount Depots are situated, as a considerable amount of sickness is usual in remounts newly arrived, particnlarly from overseas. Others are suitably placed at the Advanced Base, or at centres conveniently accessible from particular sectors of the fighting line. They are the main feature of the Veterinary Service, and are specially designed, organised, and equipped for skilled treatment and the comfort of the patient in every way.

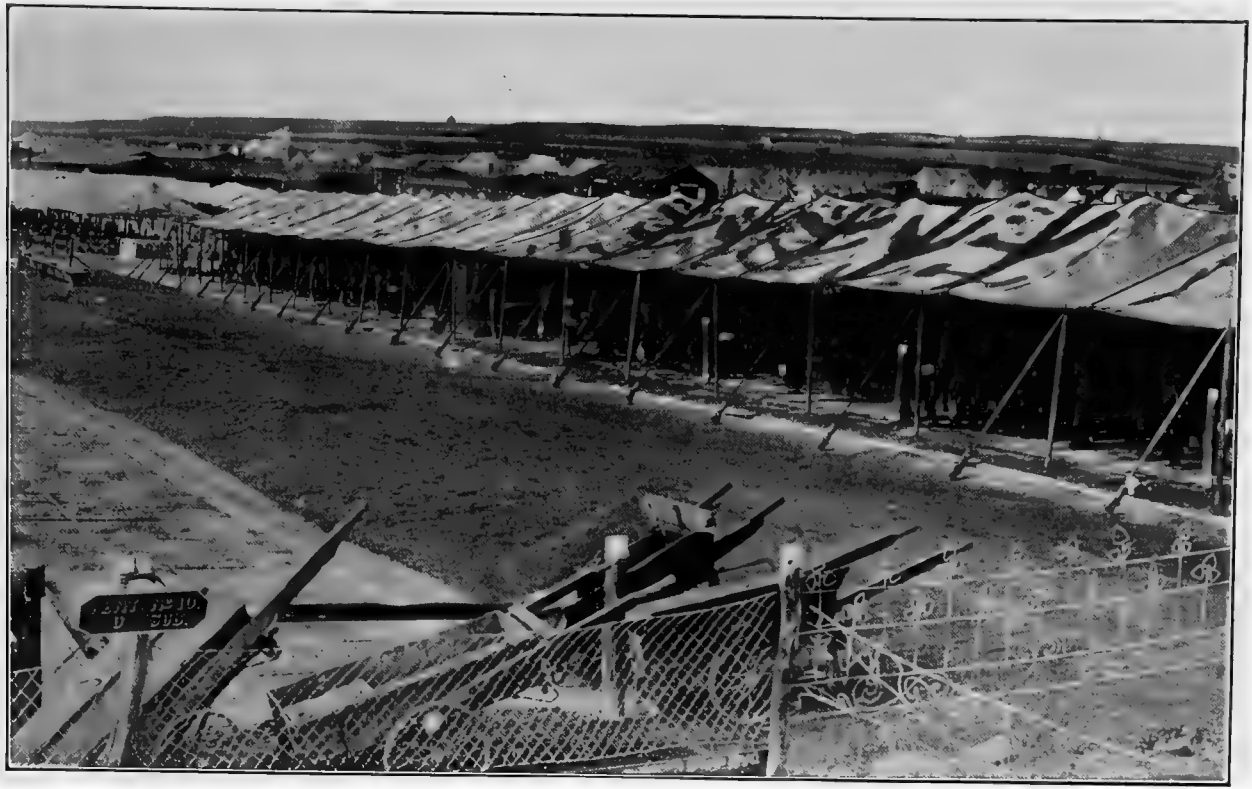
Veterinary Service has just reason to be proud of its hospitals during the Great War in its various theatres, and of its achievements in treatment both medical and surgical. As may be imagined the experience gained in surgery has been of incalculable value to the veterinary profession as a whole. It is quite impossible to describe adequately the efficiency to which these units attained during the war. Results, and particularly in surgical treatment, were astounding.

An idea of the magnitude of work done in Veterinary Hospitals and Convalescent Horse Depots in France will be gathered from the following summary covering the period from 18th August 1914 to 23rd January 1919 :—

Admitted	725,216
Cured	529,064
Died	18,975
Destroyed (including animals destroyed and sold for food).	127,741
Sold to agriculturists	29,524
Remaining under treatment ...	19,912
Total ...	725,216

In stating these figures it is at the same time necessary to mention the following facts in connection with them. The principle of the Veterinary Service was to get down from the front as many animals as it was possible to save; in other words to give every animal a chance. Many were hopeless from the start, and others from an economic point of view were not worth treatment. But they commanded a commercial value either for purposes of food, or for by-products in the case of those deemed by Vety. Officers to be unsuitable for food.

The number of destructions may seem high, but the foregoing table will explain this, and it will be shown in a subsequent chapter that the total receipts for disposal as food in Army areas and in Veterinary Hospitals up to 31st March 1919 amounted to the large sum of £1,328,000, while the profit accruing from by-products was £56,000. It will be realised also that with over four years of war, the working efficiency of animals individually became much impaired, and that a Category B in animals resulted in like manner to that of men.



TENTED HOSPITAL IN FRANCE.

The percentage of cures in veterinary hospitals up to the second year of the war amounted to 84 per cent.; it then came down to 82%, 80%, 78%, and gradually lower. The care of animals improved as the War progressed, but the constant strain of service weakened resistance and recuperative powers of individual animals. Again, without specific mention or experience, the difficulties of a large army landing in a foreign country, and without cover for animals, either healthy or sick, can hardly be appreciated. During the first winter in France, a truly dreadful one in point of rainy weather, excepting a certain number of brick sheds, there was no available covered accommodation for sick animals nor for newly landed remounts, the remount heavy draughts suffering heavily from catarrhal and respiratory sickness of an infectious nature. Conditions and circumstances during the very early days of the war in France were exceedingly hard on animals. Inefficiency during the first winter, and about the time of the first battle of Ypres stood at 15·8%. In later periods, though in winter it rose to 12%, it was brought down during the good weatner of summer to as low as 7·4% at times. I propose, however, to deal with inefficiency and disease under the Section which wlll be devoted to " Wastage of animals in War."

The Veterinary Hospital provision for the original Expedisionary Force comprised six Veterinary Sections each consisting of 2 Officers, 5 Staff Sergeants and Sergeants, 6 Corporals, 10 Dressers, 4 Artificers, 83 Horse keepers (Cavalry Reservists) and 4 Batmen, the establishment of each Section being for the treatment of 250 patients. These could be utilised singly as Hospitals or grouped together, as circumstances necessitated. The total provision was therefore for 1250 sick animals, which for a Force of 53,000 animals represented approximately 2½ per cent., a totally inadequate provision (Note.—Hospital provision in peace is 6 per cent.). Personnel had to be detailed from reinforcements of combatant branches, and the evil of borrowing, which exists in India at the present day, showed itself in the early days of the war in France.

Reorganisation of Veterinary Services then became the order of the day. Veterinary Hospitals on the basis of 1000 sick animals were formed, complete with personnel on a self-contained basis. With the growth of the force these were at

first increased to 1250 and subsequently to 2,000 patients each. From an economic point of view in conserving officer and man power, the larger hospitals are commendable. It is cheaper to add to an existing institution and establishment than to create new units, Military Works Services are simplified, and conveniences of railways, supply, and transport are the better met. It was found that our Officers, Non-commissioned Officers and men could handle a unit of 2000 sick animals just as easily as a smaller unit, provided the interior economy and working followed definite lines of decentralization of duties, which in all hospitals was adopted to an efficient end.

The original unit of 250 patients has consistently been preserved by Veterinary Service in its hospital organisation and marks a sub-division of a large hospital, each sub-division in personnel being a small complete unit in itself, capable of being detached if necessary, singly or in groups, to meet varying circumstances of forward movement, etc. The following table will make this clear :—

No..... Veterinary Hospital (2000 Patients)

		Sub-divisions.								
Details.	H.Q.	A	B	C	D	E	F	G	H	Total
Officer Commanding	1									1
Officers	1	1	1	1	1	1	1	1	1	9
Adjt. and Q.-mr.	1									1
Warrant Officer	1									1
Staff Sergeants	1	1	1	1	1	1	1	1	1	9
Sergeants	1	2	2	2	2	2	2	2	2	17
Lance Sergeants	2	1	1	1	1	1	1	1	1	10
Corporals	1	4	4	4	4	4	4	4	4	33
Lance Corporals (including Dressers)	2	3	3	3	3	3	3	3	3	26
Privates (Dressers)	5	8	8	8	8	8	8	8	8	69
Privates (Grooms, etc.)	14	52	52	52	52	52	52	52	52	430
Farr. Q.-m. Sergeant	1									1
Farr. Staff Sergeants and Sergeants		1		1		1		1		4
S. S. Corporals			1		1		1		1	4
Shoeing Smiths		3	3	3	3	3	3	3	3	24
Saddler Corporal	1									1
Saddlers	4									4

Provision of personnel and accommodation for Veterinary Hospitals and Convalescent Horse Depots on L. of C. in the B.E.F., France, was on the basis of 10 per cent. sick of the Force: 7 per cent. of this was Veterinary Hospital and 3 per cent. Convalescent Horse Depot. Two per cent. was the normal amount of minor sickness maintained at the Front. In November 1915 the L. of C. provision was cut down to 8 per cent., but so heavy were the casualties and so great the congestion and overcrowding that a return to the 10 per cent. basis was forced upon us. At one time as many as 45,000 sick animals had to be cared for on L. of C. and it will readily be realised that the provision of accommodation for this number placed no light tax both on the Military Works and Veterinary Services. Accommodation for 39,600 sick and convalescent animals was actually provided, and this amount would never have been reached if Veterinary Service had not accepted the principle of rendering assistance in personnel to the Military Works Service in the construction of their installations. The man-power situation absolutely necessitated it, and there was the constantly burning desire to get the sick under cover during inclement weather, which seemed ever to prevail. It is necessary in this article to dilate somewhat on stable construction, as the success of treatment greatly depended on hygienic surroundings and suitable facilities for work, and there are one or two items that I would specially like to mention.

Lay-out Plan. This was in blocks of 250 standings on the sub-divisional basis above mentioned, the lines of stabling being double, with a partition between. The lines were thirty-six feet apart, with an alley way of nine feet behind the animals, the rest of the space being laid away to grass. Two stalls could be converted into one loose box or enclosure if desired, and at the end of each line was an expense forage store. Roads between blocks were a first consideration, and it was necessary to limit the movement of animals and transport, otherwise a quagmire was the result. Each block had its own dressing sheds, forge, water troughs, etc., so that they were separate entities in view of any outbreak of contagious disease. Mangers were of continuous iron sheeting and could be easily disinfected.

Many of the hay racks were made from hay-band wire, in fact this article was made use of for very numerous purposes.

Material of buildings. Some stables were of wood, and were erected under contract. Others were of iron of standard pattern obtained from England and could easily be screwed together and erected by our own men. They could be taken down and erected elsewhere if a forward move was necessary.

Horse tents. In the very early days of the war, when there was little in the way of covered accommodation, I chanced to find a circus owner stranded at Gournay-en-Bray, and obtained permission to purchase his tents, including a large round performance tent, four horse tents, which would accommodate forty horses each, and an elephant tent. A chalk pit at the Advanced Base comfortably held the large round tent. Its numerous poles were shortened by three feet, its top was lowered, and it remained in glorious function in its abode, affording accommodation for 160 horses for nearly two years, until Anno Domini tolled the knell of its demise. The horse tents proved invaluable, and were the origin of a complete tented hospital and several tented sub-divisions of other hospitals. One hundred and two horse tents, each holding fifty horses in a double row, were maintained by Veterinary Service in France. They were easily erected, were stable in bad weather if made to proper design, and animals did well in them. They should form part of the mobilisation equipment of Veterinary Hospitals and with ordinary care will last two years.

Stable floors. I was often asked the question whether I would have "pucca" standings or overhead cover. Any one who had experience of the mud of France and Flanders would have found no difficulty in replying, and would have plumped for pucca standings every time. Solid standings and hygienic surroundings are indispensable factors in institutions for the treatment of sick and wounded, and particularly where contagious ailments are concerned. Stable floors exercised the attention of hospital commanders in France more than any other item of hospital management. The material used comprised bricks on edge, beech planking, stones, cobbles, cement, and wooden blocks. Perhaps the best of all was pine or beech trees sawn across in four-and-a-half-inch blocks, and

VETERINARY HOSPITAL—A CONVERTED BRICK SHED.

set in tessellated form in chalk and cinders or sand. Such a floor lasts indefinitely and is not slippery.

Water troughs. A great feature of Veterinary Hospitals and Depots was water troughs. The earlier ones were wooden with zinc lining, or canvas on wooden frame, but the latest and cheapest were of reinforced concrete and were made by the hospital personnel on the spot. Each line of stables had its own water trough with water laid on, so that if any untoward outbreak of contagious disease occurred, its spread was limited.

It is very difficult in a limited space to chronicle all that appertains to a Veterinary Hospital, but before passing on to notice its legitimate function, there are a few things worthy of mention.

The category of the personnel has been previously alluded to. They were most comfortably hutted, and it would have been impossible to have found any body of men even in peace more blessed with comfort in their well-ordered barrack rooms, their messes and dining halls. Their pleasures were not forgotten, and there were Y.M.C.A. and Church Army Huts, and Force Canteens for their off times. Gardening was the order of the day when work was done, and to such a degree was this encouraged that the majority of Veterinary Hospitals were self-supporting in vegetables for the whole year.

The good order and well kept premises reflected on the well-being and smartness of the men, and made for the more successful working. Even the animals appreciated their cleanly and it may be said beautiful surroundings. For them it was intended to grow green crops and roots all the year round, and sanction had been given for 100 acres of land per hospital for the purpose, but the end of the war came before it could be carried into effect.

Amongst other economies may be mentioned the extraction of gas (carburetted hydrogen) from horse manure at one or two hospitals, and the utilisation of it for cooking horse food. It is a simple process, but requires a pit for proper production.

Straw bedding was not possible, It was much better to put such a valuable article into the animals bellies than under their feet. Each Veterinary Hospital and Convalescent Horse Depot was equipped with power chaff-cutting and corn-crushing machinery and there was nothing wasted.

Veterinary Hospitals and their Functional Role.

It is quite impossible, and it would be outside the scope of this work to describe in detail the methods pursued in treatment and the technicalities attached thereto. It will be realised that innumerable ailments in varying degrees were encountered during the four-and-a-half years of hostilities; the more serious of them, constituting grave wastage, will be dealt with in the chapter under the heading of "Wastage of Animals in War." It will, however, be instructive to outline the grouping of hospitals for practical work, and to follow the course of animals through them.

With operations of such magnitude and with the total large number of casualties to be handled, it was found both from an administrative and practical working point of view, that Hospitals were best located in groups of two or three together, each group (excepting essentially base hospitals) functioning for particular sectors of the front line. Each group consisted of:—

Reception Hospital: Mange Hospital: General Hospital.

On arrival at the Reception Hospital patients were subjected to the mallein test, were inspected, sorted and despatched, with a minimum loss of time, to one of the adjacent hospitals according to the nature of their maladies. If any cases were considered hopeless or economically not worth treatment, they were put aside for inspection of the Deputy Director of Vety. Services, L. of C., and his orders taken as to their disposal for purposes of food or otherwise.

Those animals requiring immediate surgical treatment were subjected to operation at the Reception Hospital, and it was no uncommon sight to see three animals in the operating theatre under chloroform at the same time. At some Reception Hospitals unloading arrangements were so complete that they were provided with their special railway sidings. Reception Hospitals also undertook treatment of medical and surgical cases in the same manner as a General Hospital, in addition to reception work.

Mange cases were transferred to Mange Hospitals as soon as possible, where special treatment was applied; dipping baths being part of their equipment.

Cases of debility which required only rest and feeding up were despatched direct to Convalescent Horse Depots, one or more of which was reasonably convenient to the various groups.

At the Reception Hospitals each animal was given a hospital card on which was stated the date of its admittance, a brief description, the unit to which it belonged, and its ailment. The card accompanied the animal wherever it was transferred, treatment was entered on it, and it was filed on discharge. Some check was necessary on the length of time animals remained under treatment, as obviously it was financially unsound to maintain them in Hospital indefinitely. The above mentioned cards were therefore carefully scrutinised, and moreover a "Form at a Glance" showing numbers under treatment by weeks was kept up.

Very few animals were permitted to reside in hospital beyond three months. In addition to those palpably worthless, which were speedily disposed of, any animals resident six weeks and over were shown to the D.D.V.S., L. of C., for consideration of further retention or for casting. They were again seen by him periodically. Castings were fairly free, as chronically unsound cases were of no use for front line work if patched up. Certain horses, particularly of a good draught type, considered fit for work on Lines of Communication, were branded on the foot with the letters V.B. signifying "Veterinary Base." There were a good many of this category towards the end of the war, and it was possible to re-classify some of them for service at the front. The transport of Veterinary Hospitals was either of this category, or of patients worked for a short time to get them fit before discharge to Remount Depots. Unfortunately, as I will allude to later on, so many fine valuable horses suffered from disease of the eyes resulting in blindness, but they were equal to useful work on L. of C. Whether it was a case of "What the eye doesn't see, the heart never grieves," or whether it was parallel to the feeding of ducks in a dark cellar, the majority of blind horses became fat and maintained wonderful condition. A pair of blind draught horses belonging to a Veterinary Hospital took first prize at a Horse Show for the best horses of the Show.

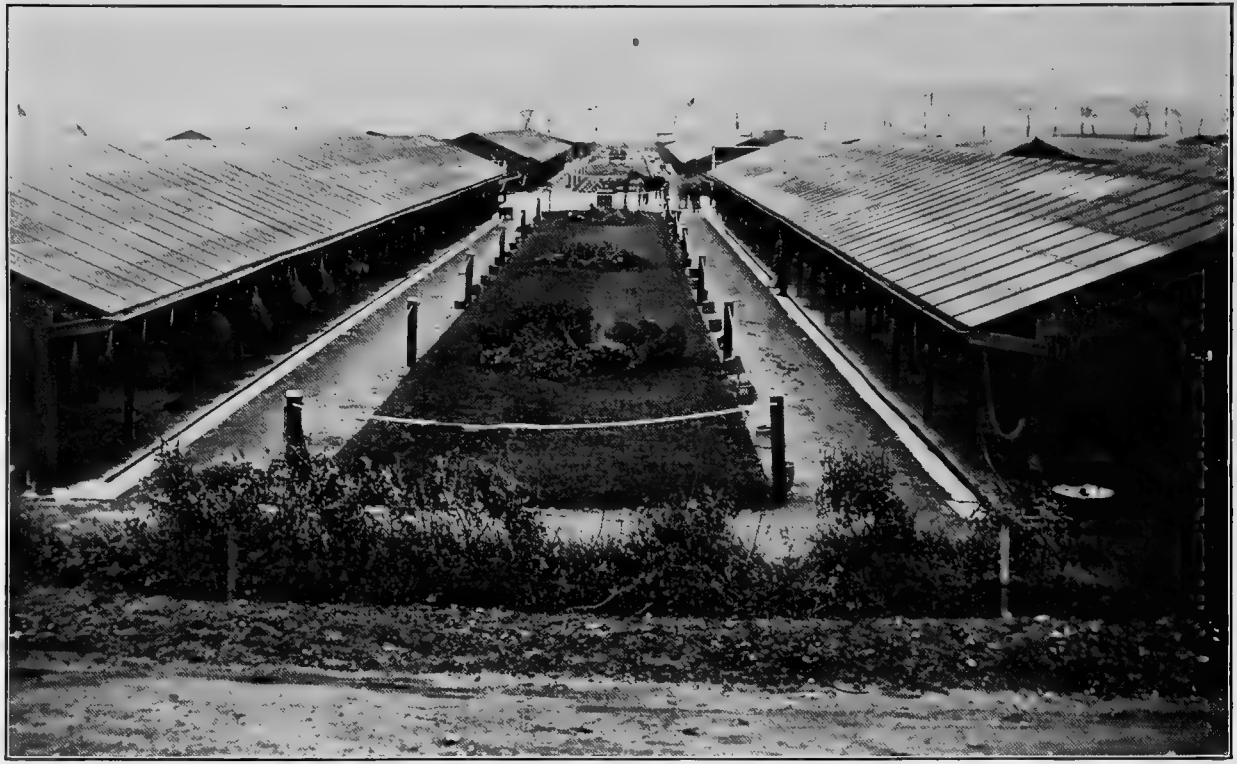
On an average 3000 horses were discharged cured to the Remount Services weekly, and a special point was made of the good order in which they were turned out. Stable management is just as important in a Hospital as the actual treatment of ailments, and I have no hesitation in saying that Veterinary Hospitals excelled in their stable and line management. It is little good being authorities on the subject if the example is not shown. And it was no easy task during the wet and muddy times of winter to clean and groom the majority of animals, foul of skin and caked with mud as they arrived from the front.

The disposal of these animals wasted by war, their death at times from absolute exhaustion, their destruction whether for food or otherwise represents the saddest side to the Service whose rightful mission is to cure not to kill; but we are cheered by the fact that never in the history of war were sick, wounded, and enfeebled animals, tended with more care and sympathetic consideration in hardships which are inseparable from war. It is right for me here also to mention the kind thought of persons far off from the scene of battle, who contributed so liberally with their money to lessen the hard lot of the creatures engaged in war. Through the agency of the Royal Society for the Prevention of Cruelty to Animals, which was duly accredited as a Voluntary Aid Society by the War Office, the enormous sum of £100,000 was subscribed and devoted to the provision of complete Veterinary Hospitals, Horse Ambulances (both horse drawn and motor), and many other appliances for the benefit of disabled animals in France.

Convalescent Horse Depots.

In veterinary organization these institutions are not altogether for animals convalescing after a period of residence in a hospital. They are essentially for animals run down and poor in condition, and requiring an extended rest. Medical and surgical cases requiring special treatment are not admitted. The nature of the treatment in Convalescent Horse Depots is therefore feeding and building up, and it is to the careful and scientific side of dieting that attention has to be paid.

The working plant must include chaff-cutting and grain crushing machinery and apparatus for boiling food. The



A Reception Hospital in France.

articles of diet must be varied in kind and amount, and include those known to produce the best results.

Rest is necessary for the worn-out and debilitated, and therefore in the construction of Convalescent Horse Depots provision should be made both for stables during inclement weather or when animals are brought up for grooming, and for paddocks where they can roam at liberty. Furthermore, as so much of the debility, exhaustion and poverty in animals in war is from lack of drinking water in the areas of operations, Convalescent Horse Depots must be bountifully supplied with good water for animals to take their fill as they desire.

The objective study of animal exhaustion and debility is real business for the Veterinarian. Curious phases present themselves. Prostration for days, flickers of life, faintings, palpitations, fits and other nervous symptoms are all to be observed, then sudden return of vitality and rapid improvement. One can realise the value of a grass field or an enclosure with soft sand or earth to lie on, under such circumstances.

The operations on the Marne and the Aisne in the early days of the War produced a large number of debilitated animals, and as soon as the Military situation permitted, approximately 3000 horses were turned out to grass towards the end of September at Gournay-en-Bray between Dieppe and Paris in the rich pasture lands there, the allotment being three horses to the hectare ($2\frac{1}{2}$ acres). In a fortnight they were different creatures. Convalescent Horse Depots were thus conceived, and Gournay became from that time until the end of the war our principal Convalescent Horse Depot. It functioned chiefly for Hospitals on Southern line of Communication and the Armies based thereon. 1180 hectares (2915 acres) of land were leased annually at the average price of 23 francs per hectare monthly, and animals were run out from the beginning of May to the middle or end of November. The Depot was organized for 4000 animals in summer and 1200 in winter. It consisted of a Headquarters and several Centres, each being provided with stabling to which horses could be brought up from the various pastures for grooming, shoeing, etc., prior to discharge to Remount Depots. Three Veterinary Hospitals were in the neighbourhood, to any of which the animals requiring hospital

treatment were sent. The personnel for attendance was very small comparatively with hospitals. Grazing had to be supplemented by a ration of grain and hay, in accordance with the season, but there were enough pastures to allow of their being rested for a while and the grass to grow after being eaten down. The free life at pasture during summer was excellent for the animals on the whole. It has, however, certain drawbacks. With large mobs of horses and much dung (animals at grass always produce a large amount of dung) flies are troublesome. Animals huddle together to get away from these pests, they do not feed during the heat of the day, preferring to congregate under trees. Hard ground of summer is bad for the lame, and as a rule heavy draught horses never do very well at grass. Mules are much more concerned with what is going on in various other pastures, and the kraal system is the best for them.

We attempted to keep horses on pasture at Gournay during the winter in the same manner as was practised at Lathrop in the U.S.A. with Remounts during the Boer War, but in spite of the well-sheltered fields, the experiment was a hopeless failure and had to be abandoned. The winter of 1914-15 was extremely wet, and the mire was too severe for debilitated horses. Moreover it was difficult to get the necessary food into the sodden undrained pastures. Impoverished animals cannot stand inclement weather: the only practical way of managing them, during winter at least, is to bring them into cover.

On the whole, therefore, the most satisfactory form of Convalescent Horse Depot is an arrangement of corrals or enclosures, and as there was no grass land available on the Northern L. of C. in France, it was on this plan that the Convalescent Horse Depots in that area was constructed. They were organised on a basis of 1200 animals. One was laid out in the form of "pawnbrokers balls," each block or ball being surrounded by an exercising track, and divided into enclosures 50 yards by 40 yards with an alley way down the centre for a Decauville railway for carrying forage, removal of dung, etc. The enclosures were for 50 horses or mules each, and each was provided with a water trough. Stabling with pucca floors was erected on two sides of the enclosures. Another Depot was rectangular, with enclosures 100 yards by 50 yards, each for 100

horses, and with the same provision of covered standings, water-troughs, Decauville railway, etc. Both were built on sand, the dunes on the French coast line being excellent for the purpose.

The personnel and transport for a Convalescent Horse Depot for 1200 animals consisted of :—

Establishment.

Officers, R.A.V.C. (O.C. of the rank of Major)	2	Lance Corporals	10
Quartermaster	1	Farrier Sergeant	1
Staff Sergeant	1	Shoeingsmith Corporals	2
Sergeants	4	Shoeingsmiths	8
Corporals	6	Privates	163

Transport. Tip-carts 5, Water-cart 1, Horse Ambulance 1, General Service Wagons 2, Motor Lorry 1.

In the general working of these depots 400 animals were under grooming, exercise and preparation for discharge to Remount Service, the remainder being at liberty in the corrals. Endeavour was made to turn out 200 per week, but discharge rarely reached that number and depended greatly on the state of the animals on admission. The personnel was detailed in accordance with this distribution, the grooming staff being approximately at the rate of 1 man to 5 animals, and the corral attendants at 1 to 12 animals.

On admission hind shoes (sometimes fore shoes also) were removed, and animals were placed in the corrals by classes, viz., Heavy Draught, Light Draught, Riders, and Mules. Riders and draught horses do not get on well together at liberty. At feeding times the lighter, vivacious riding horses clear the heavier and more lethargic animals away from the feeding troughs. Then again, grouping in all classes has to be made according to individual cases—whether they are delicate feeders or otherwise, and whether they are in poor or medium condition. Inspection of teeth is necessary, indeed this resolved itself into a routine procedure in Veterinary Hospitals and Convalescent Horse Depots, as abnormalities of teeth were found to be so very frequent and requiring remedy. One Veterinary Hospital in France even had a dental room.

Ordinarily Convalescent Horse Depots are the *rendez-vous* of the flotsam and jetsam of war; and castings of the chronically

inefficient, and the old and worn out, are very frequent. A general weeding out has to be made. It is an interesting fact that during the last two years of the war, 11 per cent. of animals evacuated from the front for various ailments were fifteen years old and over, and it was important in view of disposal to keep a record of this situation.

It was also very necessary to keep a close watch over animals at liberty, whether in pastures or in corrals, on account of contagious disease, especially glanders and mange, owing to the greater liability to outbreaks of this class of disease in debilitated animals, and the danger of insidious spread when so much individual attention is not admissible. In the dirty coats during winter, lice and mange parasites find a fine shelter.

Sand is apt to get foul with constant use of corrals, and it was necessary to rest the corrals, clean them out, and replenish with fresh sand from the dunes. Droppings were gathered up in osier baskets, and it was a noticeable feature of both Veterinary Hospitals and Convalescent Horse Depots that no dung was to be seen anywhere in the lines. A certain amount of sand colic was encountered, chiefly amongst new hungry arrivals and in those animals with capricious or depraved appetites common to ill-conditioned animals, but this was counteracted by a plentiful ration and water, an admixture of salt in their food, and feeding systematically and regularly out of mangers and hay racks. A certain number of leather muzzles were also in use. The advantages of a comfortable bed of sand for the weak and worn-out far outweighed the disadvantages of occasional cases of sand colic. It was a wonderful sight on a sunny day to see scores of them lying prone on the sand resting like dogs, and one of the first acts on being let loose from stables in the early morning—particularly the mules, was to roll in the sand.

As previously remarked, feeding was the essence of treatment. Debility or poor conditioned animals must have chaffed food and a good deal of it. The greater part of their hay and straw ration was chaffed, and Depots were provided with machinery that would chaff about two tons per hour. Grain was also crushed. Bran and linseed cake were indispensable factors. The sugary locust beans were also appreciated.

A noticeable fact, which rather upsets one's ideas of the stereotyped army routine order of watering before feeding, is that horses at liberty after partaking of food from their manger will troop off to the water trough and take a drink. It is nature's way. And the stableman, therefore, who places water either in a bucket or otherwise beside his horse in the stall is following a correct principle.

Fresh arrivals required no exercise beyond the quietness of walking about their enclosures, but later on, exercise was a part of the daily routine of treatment. Exercising tracks formed part of the installations, and animals were led and driven round in batches with a minimum of attendants. By this means they improved much more quickly. They also were worked in the Depot Transport for the same reason.

The system of identification and treatment cards was exactly the same as in hospitals, and inspections for castings by the D.D.V.S. similarly carried out.

During the war a large number were passed through Convalescent Horse Depots. Castings were naturally heavier than in hospitals, but the depots proved themselves valuable and successful parts of veterinary organisation, supplying a much felt need to a class of case that tended to congest Veterinary Hospitals. Moreover, they were run at a less cost per animal than the latter units.

Chapter VII.

SUPPLY AND DISTRIBUTION OF VETERINARY EQUIPMENT AND MEDICINES.

The Director of Veterinary Services with a Field Force is responsible for the provision of all Veterinary Stores.

The organisation controlled by him for the supply and distribution of the same, consists of :—

A Base Depot or Depots of Veterinary Stores

An Advanced Depot or Depots of Veterinary Stores

according to the size and distribution of the Force.

Ordinarily, the allotment which is most suitable is one Base Depot per L. of C. and one Advanced Depot per Army.

Each has a recognised War Establishment.

Base Depots of Veterinary Stores.

A Base Depot or Depots of Veterinary Stores is held ready in peace time, and despatched with an Expeditionary Force. They are located at the Base, as the name indicates. The amount of stores they maintain is calculated to last three months. They function for all Veterinary Hospitals and units on L. of C. and feed the Advanced Depots.

Replenishment is made either by indent on the Army Veterinary Stores, Woolwich, or by local purchase, whichever is cheaper. In India, Medical Store Depots take the place of Army Veterinary Stores, and all replenishments are made through them.

Proper ledger accounts are kept and are scrutinised by the Director of Veterinary Services and Financial Adviser as may be deemed necessary.

The establishment consists of one officer and six other ranks. The officer may be a well proved warrant officer, R.A.V.C., promoted to temporary commissioned rank, the services of a Veterinary Officer thereby being saved.

Advanced Depots of Veterinary Stores.

These small units of one sergeant and three other ranks are formed in the field, and their function is to supply field units. Though their allotment may be at the rate of one per Army, the actual number required and their distribution depends on circumstances of railway arrangements.

Experience has shown that they are best located at Regulating Stations, and the forward despatch of stores to units at the front carried out through the Military Forwarding Officers at these places. In France, until this was done there was constant trouble, and stores were frequently lost. Only three Advanced Depots of Veterinary Stores were formed in the British Expeditionary Force. One was subsequently withdrawn to a Base Depot and converted into a repair unit, the Base Depot functioning for both L. of C. and the Armies fed from that Base.

Supply and Distribution of Veterinary Equipment, with Field Units.

This has already been alluded to, and little more remains to be said. All units mobilised with certain articles of Field

Veterinary equipment as laid down in Mobilisation Store Tables. In course of time this was found to exceed requirements and it was cut down. Moreover, Veterinary Wallets and Officers' Chests were made a personal charge instead of a unit charge. The saving was very considerable. The policy now followed is a minimum of equipment with field units including Veterinary units, and the institution of Advanced Depots convenient for replenishment of field equipment and necessaries as required. When animals are freely evacuated and there is little regimental treatment, there is no necessity for a large amount of Veterinary equipment and stores with field units.

In India, the old idea of regimental treatment still exists to a considerable extent. The provision of veterinary equipment is enormous, and entails a large amount of transport to carry it. The scale has, however, recently been reduced and the home system which has stood the test of a large war will be introduced. A very large saving will be effected thereby.

Chapter VIII.

BACTERIOLOGICAL LABORATORIES.

In all theatres of war the necessity for Veterinary Bacteriological Laboratories was soon apparent, and in course of time these were duly established. Their function relates to microscopical diagnosis, research, and the manufacture, if necessary, of sera and vaccines for treatment.

This item of veterinary organisation in the field is yet in its infancy, and with the gradual advancement of Veterinary Science will be susceptible of great and better development. Matters of chemical as well as bacteriological investigation present themselves to Veterinary Service in the field, and without self-contained means, the assistance of the Medical Branch has to be solicited. Notable instances of this in France were the poisoning of animals through sewage contamination of village ponds, and poisoning by adulterated oil cakes used for food.

To meet the situation, combined Bacteriological and Hygiene Laboratories would be suitable for Veterinary Service.

In the B. E. F., France, a Base Bacteriological Laboratory was located at Rouen. It was complete with all modern apparatus, presented by the Royal Society for the Prevention of Cruelty to Animals from their subscribed Fund, and performed useful work. The same Society fitted out small laboratories for diagnosis purposes with five Veterinary Hospitals on Lines of Communication. A desire also was expressed to attach a small Motor Laboratory to the Headquarters of each Army; and without question it was a step in the right direction. It is an item of veterinary organization which should be considered in future mobilisation.

PART II.

Wastage of Animals in War.

Chapter I.—GENERAL.

Some years previous to the late war, while engaged on an article entited "Horses of different Countries and their Supply with relation to Military Service" read before the Royal United Service Institution, London, I roughly endeavoured to arrive at an estimate of the equine population of the world. My calculations amounted at that time to close on 80,000,000. The United States Department of Agriculture, in the very valuable Reports of their Bureau of Animal Industry, computed the number at 75,000,000.

By Continents, I estimated the number approximately as follows:—

Europe	... ...	40,000,000
Asia	... ...	11,000,000
Africa	... ...	1,250,000
Western Hemisphere	U.S.A. Canada and Mexico	19,000,000
	Central and South America	6,000,000
Australasia (Australia and New Zealand chiefly)		2,000,000
		79,250,000

Of the 40,000,000 in Europe there were in:—

Russia (European Russia)	...	22,096,000
Germany	... ...	4,184,000
Austria Hungary	... ...	4,020,000
(Austria 1,711,000 : Hungary 2,309,000)		
France	... ...	2,900,000
Italy	... ...	742,000
Sweden	... ...	525,000

Norway	151,000
Denmark	449,000
Holland	285,000
Belgium	241,000
Switzerland	109,000
Portugal	220,000
Spain	397,000
Greece	100,000
Turkey (in Europe) ...	300,000
Bulgaria	344,000
Servia	180,000
Rumania	864,000
The United Kingdom of Great Britain and Ireland ...	3,000,000

Taking the British Empire, my computation amounted to approximately 8,000,000, distributed as follows:—

The United Kingdom ...	3,000,000
Australia	1,626,000
New Zealand	287,000
India	1,343,000
Canada	1,500,000
South Africa (including Natal)	250,000
Jamaica	47,000
Mauritius	12,000
Malta	8,000
Newfoundland	6,000
Ceylon	4,000
Falklands	3,000
	8,000,000

The above figures must be taken as approximate only. They are also somewhat old, and subject to change by time, but I deem it necessary to quote them to show roughly the resources in animals of the various Powers which have participated in the late World War, and to preface a discussion on Wastage, which to a very considerable extent is dependent on Resources.

The Tables will also serve to illustrate the important fact that the Allies during the late World War had the command of

the majority of the useful animals of the World, and particularly of those that were essential for the draught purposes of Artillery and Transport, so greatly in demand. In a war of such long duration and of such severity in respect to both human and animal participators, the practical command of the most useful war animals was a weapon in the hands of the Allies that went a long way towards the downfall of the enemy.

Honour, therefore, to those noble creatures, who, under circumstances indescribable in their awfulness at times, shared their lot with human beings, who suffered with a dumb obedience, and helped to "win the war."

No Nation or Army has probably had more experience of animals in the Field than our own, and such experienced gained in respect to the different classes of animals employed should constitute us authorities in ways and means of avoiding wastage. The reports of Army Veterinary Service in our numerous campaigns in different countries and under varying circumstances form very absorbing reading. The achievements of animals are on occasion wonderful, but alas there are pages of unhappy disclosures where wastage was excessive to a degree, reflecting on our system of management and business acumen.

Broadly speaking, there are two classes of wastage: Preventable wastage, and wastage by Act of God, inseparable from war. Though here I shall treat of both, it is to the former that my thoughts are specially directed, and if any remarks of mine will serve as a means to keep this class of wastage ever in subjection, I shall not have written in vain.

To go into the subject without further preamble, I shall divide my remarks under the following major headings:—

PREVENTION OF WASTAGE AND INEFFICIENCY.

CAUSES OF WASTAGE AND INEFFICIENCY.

WASTAGE PECULIAR TO INDIA.

Chapter II.

PREVENTION OF WASTAGE AND INEFFICIENCY.

Causa sublata tollitur effectus (Remove the cause and the effects will cease) is one of the first principles of Medical and Veterinary Science. It goes in double harness with the old hackneyed expression "Prevention is better than cure." Both axioms are applicable to other spheres and circumstances than Medical or Veterinary Science. It is very easy to theorize on "preventable wastage," but it is a difficult proposition in war to draw the line between what is preventable and what is non-preventable wastage. Moreover, complaints or criticisms are quite valueless without proper remedies can be suggested.

With these points in view, it perhaps would appear more correct to give an account of the causes of wastage before dealing with their prevention: lest I should appear to be putting the cart before the horse. But such causes, particularly in respect to diseases, are so varied and numerous, and their recital so much attended with statistical figures, that I have deemed it better to leave them to a later stage of the work. Besides, the policy of prevention, whenever it can be carried into effect, is or should be a first consideration.

For the purpose of discussing prevention, it will be convenient to group remarks under the sub-headings here mentioned:—

Study of Resources and Remounting.
A properly organised Army Veterinary Service.
Knowledge of Animal Management.
Nature of work to be performed.
Evacuations.

Study of Resources and Remounting.

The following round figures will convey a general idea of the colossal work put on our Remount Service during the late war, and the magnitude of the machinery that was necessary for remounting operations. Being so far away from records, and having only a limited number of statistical figures by me, I

have to fall back considerably on my memory, at least so far as the British Expeditionary Force, France, with which I was closely associated, is concerned :—

The pre-war strength of our Home Army in horses was approximately 23,000.

During the first twelve days of the war 165,000 horses were impressed.

The strength in horses of the original Expeditionary Force, which mobilized and went to France, was 53,000.

Between August, 1914, and the middle of 1918, roughly 450,000 horses were bought in the United Kingdom.

Over 700,000 animals were bought overseas in the United States and Canada on British account for various theatres of war. The United States Army itself when it mobilized required a large number of animals. To say nothing of what its troops in France possessed, it had at least 350,000 animals in training in Depots in view of being sent to France.

At one period of the war in France, the British Expeditionary Force possessed roughly 475,000 animals, of which 89,000 were mules. The total wastage from death, destruction and missing amounted to approximately 250,000 up to the end of December, 1919, and about 25,000 sold to agriculturists (prior to sales on demobilzation). Roughly, therefore, during the four-and-a half years, 750,000 animals took part in the war in France, including British, Indian, Canadian, Australian, New Zealand and Portuguese Troops.

In August, 1914, 193,319 horses were on the strength of the French Army, while 799,661 were required. By November, 1917, 1,188,539 animals had been purchased in America and Spain to supply wastage.

The Belgian Government, in addition to obtaining horses through British Remount Depots, purchased in the Argentine.

Our demands for Mesopotamia and to a considerable extent for Egypt were met from India and Australia, remount operations from this side approximating 43,000 horses and 500 mules.

East Africa was supplied from South Africa.

The drain therefore of suitable animals for war purposes by the Allied Powers was stupendous, and it must be remembered that the demand chiefly related to animals of a draught type.

In the United States, for instance, our purchases were 20 light draughts to one of other classes combined. The world's supply of suitable stock is not inexhaustible. How demands were met is surprising; and rightly, our Remount Services at Home and Abroad have reason to be proud of their achievements in the difficult task that was put upon them. Shakespeare, through the mouth of one of his characters, enjoins on us to put no trust in a horse's health, and when we consider the vast number of animals that have been collected, purchased, moved by rail and sea, distributed as reinforcements to replace casualties (readers please think big and in hundreds of thousands), and their much greater proneness to disease than any human race, the wonder is that wastage has not been greater, and supply over so long a period impossible—in other words, that absolute exhaustion of resoures was not reached.

Very much less fortunate, and to her great regret as evidenced in Ludendorff's Memoirs, was our principal enemy, Germany. Her resources were exhausted; captured documents and orders revealed a burning desire to capture some of the beautiful horses of the English for her Transport. She was not enriched by animals of ours falling into her hands, which is a glorious page in the history of our animals in the war. And the imposing sight of the grand German Army in retreat with mixed teams of oxen and horses was a crown to her *débâcle*. The majority of German animals taken by us were evacuated to our Lines of Communication and were sold for sausage meat.

Germany, though credited with over 4,000,000 horses in normal times, of which nearly 3,000,000 were in Prussia, was an importing country. She bought on an average 21,000 annually from Belgium, taking, it was said, the best of the Ardennes horses. She was also credited with taking 16,000 annually from Denmark, many of them for light draught work. Altogether her annual import returns showed a little over 100,000. The best material was almost entirely appropriated to supply the demands of the military authorities, the remainder being doubtful for military purposes.

Austria-Hungary was fairly well stocked with horses, but Hungary was essentially a light horse country, and Austria proper never afforded much of a field for remount operations.

Rumania, Bulgaria and Servia were all importing countries from Hungary, for Army purposes.

After the disrupture of Russia, Germany was able to arrange a limited number of animals from the Ukraine, but, compared with other countries Russian animals are small; Polish horses, for instance, are chiefly of the riding type.

So that taking all in all, the resources of the Central Powers were bad. The efficiency of an Army very greatly depends on its horse supply, and Germany must have known, unless her vision was so clouded with arrogance or distorted through megalomania, that her feet were but clay. In a matter of horses she never had a dog's chance of successful issue in a protracted war of unusual severity, even though the Schlieffen policy of over-running Belgium and a portion of Northern France in the early days was calculated to bring a certain number of useful animals into her net.

Remounting in relation to Wastage. To know exactly where to go for supply, precisely the class of animal to buy, and to have suitable experienced purchasing officers are essential factors of Remounting—if wastage and inefficiency are to be avoided.

We bought our experience very dearly during the war of two years and seven months in South Africa. During that war 518,794 horses and 150,781 mules and donkeys were provided. 347,007 horses and 53,339 mules and donkeys were expended during the campaign, and 13,144 horses and 2816 mules and donkeys were lost on voyage. The total expenditure on horses, mules and donkeys, exclusive of freight, amounted to £15,339,142. A Court of Enquiry, appointed by order of the Commander-in-Chief, was held in 1902 to enquire into the administration and organisation of the Remount Department, the purchase of animals during that war, their transport overseas, and the causes of the enormous losses during the campaign.

The salient facts of the findings of the Court and its Committees were briefly summarised as follows :—

(*a*) The normal duties of the Remount Department in peace were confined to transactions with dealers in the United Kingdom. To meet additional requirements of horses

on mobilisation and to provide for wastage of a war, reliance was placed in a system of registration amounting to 14,000 animals.

(*d*) There was no system of obtaining and tabulating in time of peace, information as to horse supplies of foreign countries with a view to the contingency of a great expansion in requirements.

(*c*) No steps were taken in view of the possibilities of a war in South Africa to ascertain what animals could be obtained from abroad until four months previous to the actual outbreak of hostilities, when officers were sent to certain countries to enquire as to the supply of mules. Consequently when the conflict came and a great number of animals had to be procured from various countries, officers despatched for that purpose, for want of previous information and system, were much at the mercy of vendors both in a matter of price and quality of animals purchased.

(*d*) The Director General of Remounts at that time could do little with the organisation with which he was furnished in time of peace. His functions were strictly limited and his staff even more so. It was inevitable that a Department with no provision for expansion, when called on suddenly to extend its operations to a previously unconceived degree, should fail through lack of system.

(*e*) The evidence confirmed the view that the chief cause of loss of horses was that they were brought from distant countries, submitted to a long and deteriorating sea voyage, when landed were sent into the field without time for recuperation, and there put to hard and continuous work on short rations.

(*f*) In the early part of the war there was great pressure for horses but no well-thought-out system for the establishment of Base and Advanced Remount Depots in which animals could be held, exercised and prepared for issue.

(*g*) There was also ill-provision of Veterinary Institutions to which sick and over-worked animals could be sent to recover. In the beginning, by reason of the inability to

obtain fresh horses, those on charge of units were worked to the limit of their physical endurance, and then were left to die on the veldt.

Truly a very sad state of affairs, and absolutely out of all keeping with the nature of a Britisher who loves his animals.

However, the Army at home learned its lesson, and in a matter of Remount Intelligence, the War Office in its Remount Department at the commencement of the late World War was in full possession of the remount resources of every country, and had its machinery ready for operation. Looking at the question purely in the light of reduced wastage and inefficiency of animals, and furthermore in constructive criticism towards that end, I am inclined to think that the organisation of Remount Service at home is still susceptible of improvement. India is far ahead of it in that respect. If efficiency is to be maintained, a Remount Service should be a self-contained Corps and with a policy admitting of a continuity of service and experience, in the same manner as other branches of the Army. The personnel of Remount Depots pre-war was a mixture of civilians and Army Service Corps soldiers; those in France, excepting the Indian Remount Depot, were borne on the strength of Army Service Corps so far as other ranks were concerned, while the officers were retired officers or others specially entertained. I trust it will not be thought of me that I am actuated by any carping spirit in making these remarks, but I am sure those who have had the experience of the late war will readily agree that for real efficiency all Administrative Services should be self-contained.

With the great tendency in freshly joined remounts to sickness of a communicable nature, *i.e.* respiratory sickness particularly, it is most necessary and important to exclude all sickness from Remount Depots. It is an impossible situation, for instance, to combine a Remount Depot and a Veterinary Hospital in war whether under purchasing arrangements, or in the field. It is inviting disaster, and placing a millstone round the neck of Remounting that will drown it. Nothing should be maintained in Remount Depots but animals fit to issue, or reasonably so. Any unfit should be rigidly excluded, and relegated to Veterinary Service whose function it is to handle this category. Hence the Remount Service would be "Providers"

and "Finishers," and the Veterinary Service "Menders." This broad line of policy—"Fit" and "Unfit"—was laid down by the Director of Remounts and myself, as Director of Veterinary Services, from the very beginning of the campaign in France, and was rigidly adhered to throughout. Obviously it was correct; and its success in avoiding wastage cannot be gainsaid.

The standard of efficiency and excellence in horses demanded by Units and Formations at the front was very high, appearing sometimes to be bordering on the ridiculous. If the article was not prime, back it came to Lines of Communication with dissertations on the subject of quality. I had great sympathy with Remount Service in this matter, particularly as horses after a long journey by train, or a dusty or rainy road journey, do not as a rule look their best; and at the instance of the Director of Remounts, I arranged with my representatives with Formations not to report on remounts until they had been at least three days with their units. The particularity was also reflected by Remount Depots on Veterinary Hospitals, and the output from the latter to Remount Service had to be issues *de luxe*. It all sounds somewhat absurd when, as the war progressed, there were category "B" horses as well as men; but when one seriously considers it, the procedure was correct. We were able by all our means to keep down the total inefficiency of our Force to 12 per cent. in winter, and about 7 per cent. in summer, only 2 per cent. inefficiency existing at the Front.

Horses, too, like ourselves, have their "days." They look fine creatures one day and awful brutes another. And *à propos* remount purchasing, I like to relate a story of a well-known and experienced Remount Agent in Calcutta, who on walking round the lines of his purchases one day, stopped at a loose box containing a sorry looking object. "What horse is this?" asked he. "One you bought from Mr. So-and-so a few days ago," was the reply. "You don't mean to tell me that I bought such a horse" was his comment. Further on in the line was a horse of noble presence, full of fire and indignity at rejection. "By jove, there's a beautiful horse," said the Remount Agent. "Yes, that is one of Mr. So-and-so's which you rejected a few days ago," was the answer.

A good many of us have been up against similar situations.

A properly organised Army Veterinary Service.

In an article published in the July issue of the Journal of the United Service Institution, I described the constitution of Army Veterinary Service in War, its function in relation to the preservation of animal health, and the procedure appertaining to it in its *rôle* of treatment of ineffectives and the reduction of wastage. It is therefore not necessary to refer to it again except to say that it forms practically the most important item in the matter now under review.

I may further say that approval has now been accorded to the formation of a properly organised Army Veterinary Corps in India which I am sanguine will not only render an efficient account of itself in the course of time, but will contribute greatly to its own cost by reducing loss and grading up efficiency of our animals in India. It is a business proposition.

I intend also to deal later with an economic side to wastage of animals, so will defer further mention on this heading.

Knowledge oi Animal Management.

Too much stress cannot be laid on this very essential factor in the reduction of wastage. So important is it that I deem it necessary to devote a special section to the subject, and to the *rôle* of Army Veterinary Service as an Instructional Agency.

It was extraordinary in France how our original Divisions and Cavalry never lost the art and knowledge of management of Army animals. This was intuitively handed down, like the good tone of our "Old Contemptibles" and as a part of their *esprit de corps*. In speaking of Animal Management I do not wish it to be inferred that I allude to Horsemanship or Horsemastership in the sense of the fine art of riding, driving, breaking in, and study of the latest creations that cover the nether extremities of the faculty, but rather to the hygiene of the animal that preserves his health and adds to his utility. It is all a matter of instruction and it forms a part of the curriculum of a soldier's training in common with other items. What knowledge begins, association fosters, and the end is the love of comrades in arms, reciprocated and enduring.

I recall an incident—it is only one of many—of a visit to an "Old Contemptible" battalion after three years of war of the

severest. On asking if the battalion had any of the original horses it possessed when I knew it in Ireland in 1910-13, the officer, with the greater pleasure and pride, brought out the original pair of wagon horses and the pair of machine gun cobs. I had hit the happy theme in one act. Such is animal management. Where are the Victory Medals?

Horse Shows. To the minds of a good many people, Horse Shows in war would appear to savour of frivolity in the face of a grave situation, but from an instructional point of view—as object lessons, they are to be recommended. They also afford pleasure and relaxation to the individual and a break from trying circumstances. Most Divisions in the B.E.F., France, had their Shows, and the prize winners took part in Corps and Army Shows. Perhaps too much concentration on individual horses or teams was displayed, and a most useful form would relate to whole units. The interest which they created was, nevertheless, all to the good of the animals.

However, there is another side to the picture, and one which I personally think is an equally good—perhaps a better object lesson. This is to be seen in Veterinary Hospitals on Lines of Communication, and is represented by the flotsam and jetsam of war. If it is necessary to show all and sundry what animals *should* be like by means of horse shows in war, it is all the more expedient that those charged with the care of animals should witness what they *should not* be like, and what wastage really means. For this reason Classes of Animal Management were held at Veterinary Hospitals on Lines of Communication for young officers and non-commissioned officers, and to these I will refer under the heading of "Army Veterinary Service as an Instructional Agency."

Watering and water discipline. There is probably nothing that knocks animals out so rapidly as lack of water, or water so impure that animals refuse it. It is essential that water arrangements both for men and animals, and a proper water discipline, should be specially instituted. I remember an Army Commander in France taking me to a map in his room and specially drawing my attention to a portion of country over which a large offensive was to be made. It was the waterless

area towards Bapaume. He remarked "You are going to have a bad time," and his words proved true.

Water supply is a difficult and yet a very important proposition where large bodies of troops are concentrated. Picture the concentration of 150,000 to 190,000 animals in a radius of a few miles, and the prospect of a successful advance over a country removed from water in the summer season. French village ponds in occupied areas were of no value. They were the cause of sewage poisoning in some instances. So particular were Corps in certain areas that the maps of Brigadier-Generals' Administration were marked with water points and even water troughs for animals. But for these wise provisions, in these areas our wastage would have been much heavier. Animals travelling by train, and especially sick horses under evacuation, had their own self-contained watering arrangements. Water parades, time schedules, and the presence of an officer at watering parades are part of the requisite care of animals in the field. It is a feature of animal management in India, and in frontier expeditions of that country, which requires putting on a better basis, and particularly with regard to the camel. The remedy lies in the special concentration of thought on the subject and a discountenance of the "*Kuch purwa nahi*" haphazard methods that are apt to prevail.

Foods and Feedings. It is said that an army fights on its stomach. It is quite true. There is no physical endurance without a liberal supply of food. *Morale* goes to pieces on an empty stomach. I am convinced that one of our best items of propaganda was the display of comestibles and the prices at which they could be obtained, in the Expeditionary Force Canteens in France when the Germans pushed our troops back in the Somme area in March 1918. It was an eye-opener to an enemy who had been imbued with tales that England was being brought to her knees through their "unrestricted submarine warfare."

What is true of men is equally true of animals, the only difference being that while the one can voice his complaints and objections, the other must suffer in dumb obedience. All

the more reason therefore that the wants of the latter should receive the utmost consideration.

No animal can perform hard work, and the severest of all work which war necessitates, without the most particular attention is paid to his food and feeding in all its details of quantity, quality, periods and appliances. The records of Debility and Exhaustion, which I will presently show, bring home to us most forcibly the necessity that the most profound care should be given to the provision of food for our animals and its administration to them. Though there are contributory and concomitant causes of Exhaustion and Debility, such as lack of or insufficiency of water, climatic influences, excessive work or undue exertion, the chief factor is insufficiency of food. Starvation is an ugly word to read in reports.

Food supply in war, and its transport, is a difficult proposition. The pound of meat and pound of bread or biscuit for the man is an easier matter than the ten or twelve pounds of grain and ten pounds of forage for the horse; and these latter bulky amounts are opposed to successful ventures of offensive warfare. It is not always possible to tap the resources of a country or area through which troops operate. There comes a time when even that is exhausted, and everything has to be sent up from the Base or from the Lines of Communication Depots. Long Lines of Communication by road—such as we have experienced in India, in Somaliland, in the Sudan—represent a tough problem to the Military Authorities, much more so than in countries well endowed with railways. Hence it is that animals may suffer by failure of supply.

War is always costly in food supply. The pre-war cost of a daily horse ration in the Army was from 1/3 to 1/6. In the last year of the war in France it was 5/2, and at the very end, if my memory serves me right, it either reached or was likely to reach 7/- per ration. Substitution diets and equivalents had constantly to be thought of and adopted. The foresight shewn, and the manner in which the supply of foodstuffs to our animals was effected during the late World's War, was nothing short of wonderful.

I mention the above to point the necessity for economy, which has a great bearing on wastage of animal life—Waste not, want.

On the Western Front.

not! Economy is twofold. The first relating to Supply Services in substitution diets, and the power to issue equivalents, whenever circumstaces demand, as already alluded to; the second relating more directly to the animal itself. The latter is where the Commanding Officer, the chief instrument of horse-mastership and animal management in the prevention of wastage, comes in. What avails supply if the ration does not reach the animal's stomach? Therefore it is that the commonest rules and routine procedure of stable management must be observed. No excuse whatever can or should be accepted for the want of provision of nose-bags, hay nets, and feeding cloths —the plates, as it were, of creatures who cannot make expedients for themselves. Wind has a habit of blowing hay out of the reach of animals tied to a picket line; grain placed on the ground in wet weather is trodden into the mud and wasted. There is shocking waste of bhoosa in India. Consider the transport necessary to get this article to animals on service. It is an innutritious diet at its best, and I think the time has come when by a combination of some other more nutritious "roughage" (*e.g.* berseem, shaftal, lucerne, or other leguminous fodder) with bhoosa in bale, a more suitable service ration should be devised. I am certain it would be favourable to animals, and represent economy in transport.

Time to eat is an element that has to be reckoned with on service. This, or rather the lack of it, was one of the reasons why our beautiful big heavy draught English horses, requiring a bulky forage ration, went to pieces in France—as I will show in subsequent pages. Military animals are not like dogs, that can bolt their food with impunity. It takes horses five minutes at least to eat a pound of grain and fifteen minutes to eat a pound of hay. Bullocks and camels must have time to ruminate: it is part of their alimentary and digestive procedure, and as a rule they sit down to it.

Forage rations can at times be supplemented by grazing, and advantage should always be taken where it is possible or when time or season permits. A certain amount of grazing was obtainable in the devastated areas in France. Chaffing of hay and straw was resorted to as an economical procedure. The forage rations of French Army horses included straw, that

uneaten going for bedding. The policy of the British Army was to ensure by chaffing that straw went into the belly of the animal, not under it. We also used a considerable amount of linseed and other cakes—100 tons per month, and locust beans, both articles chiefly for the sick and debilitated animals on Lines of Communication. Human beings, and to wit prisoners working in Veterinary Hospitals on Lines of Communication, were quite partial to the sweet, sugary locust beans (pods) whenever they were available.

Lastly I may mention the green crops that were grown for animals in the vicinity of stationary units on Lines of Communication in France. If the war had lasted another year, the majority of Veterinary Hospitals would have been self-supporting, by intensive cultivation, in green crops—rye, vetches, Indian corn, etc., and roots—for more or less the whole year; arrangements having been made by some Hospitals to lease up to as much as 100 acres for the purpose. It was a good project to meet the ravages of wastage in war.

Clipping and Clothing. So much controversy has centred round the subject of clipping in relation to wastage that I deem it necessary to refer to it briefly. The controversy arose out of the heavy losses occasioned during the Arras offensive of the first fortnight of April 1917, the severity of the weather from snow storms and cold being quite unprecedented for that time of the year. In view of prevention of mange—that bugbear of active service and scourge of winter—the policy of clipping had been adopted and the Veterinary Service was greatly blamed for its advocacy. In the storm of controversy it was lost sight of, or was unknown to those who rose in condemnation, that unfortunately a compulsory reduction of the grain ration for all animals had been enforced for some time previously, and continued even at the actual conflict of battle. If the hygiene of the body in respect to cleanliness and freedom from mange parasites could have been effected by strict attention to stable duties there would have been no necessity for clipping, but think of the mud of winter in Northern France, and the almost impossible and heartbreaking task to keep animals clean that are mired to the very neck! The official photographer in

France was specially asked to portray circumstances under which animals laboured.

However, so far as clipping and prevention of mange in relation to it is concerned, the policy adopted the following year was to clip early—no clipping to be done after the middle of November. Coats would then be grown sufficiently to afford warmth before the real cold weather, and the happy hunting grounds of mange parasites—dirty, long coats, would be laid waste for a certain portion of the winter.

And it is interesting to relate that in the sub-world to which I have referred there were battles, and it was left to Veterinary Service either to keep the "ring" or destroy the battlefields. I do not think we adopted the *rôle* of neutrals. But there were combats to the death between the Lice, clad in their chitinous armour, and the Mange parasites, perfect in trench warfare and subterranean passages. One year the tribe *Haematopinus* (lice) with its more insinuating ally, *Trichodectes*, won the day, but the following year the "Digger" (*Sarcoptes*), the expert chap, carried all before him, but he succumbed to Calcium sulphide and Gas.

Of course, clipped animals must be clothed; indeed in any case clothing is necessary in winter season, alike to keep out cold, wind, and wet. The string *jhool*, of several designs, cannot be beaten; its cleansing and disinfection are matters of importance where disease has to be prevented.

Acclimatisation. Acclimatisation of animals is a matter which in war has not received in days gone by the attention that it deserves, excepting perhaps in India. The experience during the South African War, to which I have referred, was an object lesson to us in this respect. We have been apt to look upon horses as machines and to forget compensating balances. No one would dream of putting Australian horses from a Southern zone immediately into a war on the Northern frontier of India, under conditions of reverse season. They must have a little time to get on their legs, and over little sicknesses incidental to changed circumstances and surroundings. The more lymphatic or lethargic the animal the more prone he is to attack from disease.

In the purchase of heavy draught horses during the late war, it was found that they invariably went sick after removal from their accustomed habitat, and a regular system of temperature taking was instituted which was extended to their arrival in a theatre of war, and before issue to units. A policy of three weeks residence in a Remount Depot in France was adopted for all overseas animals before issue, and accommodation to admit of this was arranged accordingly. The consequence was that extremely little respiratory sickness existed at the front.

Remount Training Depots and Reserve Depots. The issue of animals trained for the purpose required of them in war is a most important factor in the limitation of wastage. It is not sufficient to buy them as broken animals in an open market and ship them straight to a theatre of war. Some organization must exist where they can be proved and rendered suitable. It would appear to me that India is well advanced in this necessary procedure, and the Remount Training Depots provide a more than useful purpose.

Nature of work to be performed.

As briefly indicated in the previous paragraph, animals should start fit and trained for their particular job. It is up to the Commanding Officer of their respective units to look after their interests subsequently. He is their philosopher and guide.

A very bright feature of the late war was the splendid manner in which Infantry looked after their horses, and it is certainly a matter deserving of the highest commendation and record in the annals of our Infantry in war. Apart from that spirit of faithfulness and *bon camaraderie* which battalions showed to their animals, their success was a matter of organization, and lay in the appointment of Battalion Transport Officer. I wish that Artillery, in which Arm the heaviest work and greatest wastage lay, could have been similarly provided. Even a Brigade Transport Officer of Artillery, an appointment part of Artillery organization, to watch the interests of horses in their wagon lines while Artillery Officers were forward with their guns, would have been much better than the "horsemasters" and "wagon line officers" who were appointed, and who were nobody's children.

The greatest wastage in France was in the light draught horses of Artillery. The work of getting ammunition up to gun emplacements, over shell-pitted ground and through seas of mud at dead of night, was of the severest possible description, and the situation was complicated by lack of fit remounts of that class to keep pace with wastage. Bad, rainy weather always was succeeded by an aftermath of Debility evacuations, in Artillery units particularly. The churned up mud of Flanders, the shell holes filled with liquid mud every few steps, into which animals under load dropped exhausted—probably to drown, was a picture that required to be seen to be realised to its full degree of awfulness.

The French Army used a large number of donkeys for carrying ammunition. They were driven in lots of about twenty, and they picked their way across country, skirting the edges of the shell holes.

The war in France was not a Cavalry one, but when Cavalry in force participated in Offensive, casualties—battle casualties chiefly—were heavy. In one offensive the casualties for a week amounted to 10 per cent. of strength, but there was 1000 per cent. of gallantry that far outweighed the loss. It is war when cavalry begins to move, and you may laugh at prevention. And when behind the movement there are the pent-up feelings of several months inactivity, "I reckon there's going to be some show."

[*Note.* This is supposed to be a treatise on prevention of wastage and inefficiency].

I close the chapter with reference to Transport. In France nothing could have exceeded the high state of efficiency of animals generally in Army Service Corps units of Divisional Trains, Reserve Parks, and Auxiliary Transport Companies. They certainly were not exposed to the hard lot of Artillery horses, but they were a real good class of well selected animals, and the organization of the A.S.C. in personnel left nothing remaining for their care. The wastage, excepting in some of the reserve Parks in the early days of the war, was phenomenally small, and a large number served through the whole period of the war and returned to England at the end of that time.

The wastage in other wars, including some of the Expeditions on the Indian Frontiers, chiefly relates to Transport, and putting aside the dire contagious diseases which lay low so many of the various breeds of animals employed on Transport Service, it is a certain fact that defective system and inadequacy of personnel to supervise animals has led to wastage that can only be described as distressing. I shall refer to this more fully in the chapter dealing with the causes of wastage.

Evacuations.

I believe in figures and percentages. They are necessary for the control of wastage, and as a guide for calculating and adjusting replacements. A General Officer Commanding a Division, Corps, or Army, should always know by a simple statement how his inefficiency stands week by week, and if possible, he should be made acquainted with the inefficiency of other Divisions, Corps or Armies, in comparison.

There is no point in maintaining inefficient animals at the Front. They should be got rid of and replaced, fighting units should be kept up to their fighting strength as much as possible. This has now been thoroughly realized in the British Army, and all Formations in the Field have organized Veterinary units to effect removal; and conversely Remount Service has machinery to effect replacement by fit animals.

By this means not only is efficiency maintained but wastage is curtailed. Animals get a chance of recuperation and speedy cure when such is feasible or economically sound. Their vitality and utility are not hopelessly destroyed, and it is good business both for the animal and for the State.

Organized and systematic evacuation plays a great *rôle* in the prevention of wastage, and I am sanguine that, other things being equal, through this procedure the dark pages of utter waste of animal life and treasure will be closed for ever in the history of our Armies. Other nations have taken copy of methods inaugurated by our Armies in the Field, fully realizing the advantages which such methods carry in their train. We are proud of being pioneers.

Chapter III.

CAUSES OF WASTAGE AND INEFFICIENCY.

War pre-supposes that casualties relate chiefly to the effect of gunfire. This is not so with animals. Though, as I will presently show, a considerable number of actual battle casualties occurred in France, the majority of casualties were from other causes. It is the same in all theatres of war. Incapacity, the result of hard work and insufficiency of food, together with a long list of diseases of a communicable or specific nature, usually go to form the Veterinary wastage of war.

In my recital of them I shall have to quote a few statistics. and some of them are sorry reading: but it is necessary to see the black cloud to appreciate the silver lining, and precept must be pointed by example, whether good or bad, if progress towards the goal of efficiency is to be achieved.

I will group remarks of this chapter under the following headings:—

Debility and Exhaustion: Accidental Injuries:
Battle Casualties: Contagious and Specific Diseases:

reserving a special chapter for diseases that by reason of the classes of animals employed are more or less peculiar to India.

Debility and Exhaustion.

The history of every campaign unfortunately teems with the impoverished and exhausted condition to which animals are at times reduced. Much of it is inseparable from the hard work, exposure and other issues of war, but it is a regrettable fact that a good deal of it is avoidable, and it represents an accompaniment of war that is discreditable, and is open on occasion to storms of criticism as acts of cruelty. Poverty and its accompanying exhaustion is the hall-mark or evidence of indifferent supervision and care of animals, or a bad system in respect to their management. It is always in inverse ratio to the standard of animal management attained. There is no getting away from this fact, and until this result is realised to the full, this class of wastage will always figure very largely in

the annals of our Army. To keep it down, an educative policy in practical animal management is absolutely indispensable both in peace and war; moreover, history points to the necessity for the enforcement of stern disciplinary measures when neglect is apparent.

To go back into now ancient days, a perusal of the old Kabul papers is of absorbing interest, revealing dark pages in the history of animals that are happily past in modern times. In those days systems were watertight, and the right hand was in ignorance of what the left hand did. Transport arrangements were a thing apart from the rest of the Army, and the establishment of Veterinary Hospitals was left to the initiative of a limited number of British Veterinary Surgeons, who for extra duty performed with the Transport Department received the sum of Rs. 75 per month as against a Transport Officer Rs. 200 per month.

The animals of Transport were partly Government owned, partly hired, and judging from the report of the Inspecting Veterinary Officer, the whole system of organisation and conduct of affairs must have been quite unique. In his tour inspection Report he alludes to evident want of inspection, whereby hired animals were sent from Kohat up the line by hundreds with no arrangements for the supply of food, that being left entirely to the owners; farther on at Thal where he wished to establish a Veterinary Hospital he found utter confusion, so much so that he could not make a proper inspection of the animals, which in most instances were not even tied up in lines. There were but few animals even in fair condition, and sore backs were counted by the hundred, the sores being smeared over with mud, cow-dung, etc. At Ali Khel he found debilitated Foot-and-Mouth-Disease-affected slaughter cattle being sold by public auction to the inhabitants of surrounding villages. At Togh where a depot for camels had been formed, though the officer in charge was using every endeavour by grazing, feeding on grain, and placing animals under shelter, his camels, already debilitated, were carried off by pulmonary and dysenteric disease to the extent of 40 per cent. Government and 33 per cent. hired in 58 days. He describes an inspection of 5754 baggage animals comprising

"Packing" Shells to the Front.

mules, ponies, donkeys, camels and oxen, and found that 2326 or 40 per cent. were physically unfit for the work required of them, the majority being either under four years, or too old, pointing to the necessity for exercise of more care in selection. He characterises the camel as an utter failure on two campaigns, but speaks well of the mule, alluding specially to his marvellous digestive powers.

I am sorry to allude to that Report, but it shows what bad organisation and arrangements lead to. The records of subsequent frontier compaigns in India, excepting in the matter of contagious and specific disease, are much pleasanter reading, and the grading up of an organised system is gradually producing good results. Much, however, still remains to be done in matters of supervision and rational care. I quite disagree with the Inspecting Veterinary Officer of the Kurram and Kyber of 1879-80 with regard to the camel being an utter failure. With enlightened ideas of his management and better control of his diseases, both of which are now in progress, he is going to prove a most useful member of our Indian Transport. Under a system of stall-feeding he has merited great praise during the recent Waziristan Expedition. Why should any animal on service be expected to forage for itself? Surely it is adding insult to injury. The basis of camel feeding in India up to recently was grazing, with stall feeding in lieu. The policy has been reversed, and thousands of camels will be saved by the reversion. I will have more to say on the camel later.

In Wazaristan during the recent expedition our inefficiency stood at :—

Horses and ponies	per cent. 7·5	Camels	11·0
Mules	2·6	Bullocks	2·4

But for the unfortunate Mange which is so prevalent in camels in India, and another disease, by name Jhooling, the camel inefficiency would have been less; but conditions are being gradually improved.

Considerable loss from debility has been experienced in camels in Eastern Persia, and inefficiency ran at 25 per cent. Apart from hard work and long distances, without question a deficient food supply and defective management were the real reasons for the loss.

Of all the sad pages in the history of camels employed by our Armies, nothing can surpass that of the Desert Column in the Nile Expedition of 1884-85. Between the 30th December 1884 and 25th March 1885, *i.e.*, in barely three months, this column lost 1850 in the Bayuda Desert and 448 at Korti out of a total of 4050 camels, or 56·7 per cent. Though some were killed in action, the chief cause of mortality was forced and long-continued marching with insufficiency of food and water. The first column averaged 30 miles per day, the second column 25 miles per day. Between Gakdal and Gubat, a journey of six days, the allowance of grain amounted to under two pounds per camel daily, and no water could be given during that period. Grazing was not possible. On the return journey the animals had to subsist on only a few loads of green dhourra stalks and what grass could be collected. A good many of the camels were only four years old, and a curious statement of the covering report of the Principal Veterinary Officer to the Forces, War Office, is to the effect that purchasing officers (Egyptians) knew so little of this class of animal that some of them were not able to distinguish the sex, to say nothing of their age, or to judge fitness for the work required. A Brigade Order was published previous to the march that camels should only be watered every third day, to accustom them to the privations of the march, and that they should have their fill before starting. This was not judicious treatment, especially when it was known that the animals would have little else than dry food for the journey. Camels are not salamanders, and they require as much water as any other ruminant to maintain health and strength. The Veterinary Officer accompanying the column describes one instance of camels being 40 hours under load; one company had one man to every six or seven camels and these were Egyptian soldiers taken out of boats which had just come up the river. Truly a most lamentable state of bad organisation and arrangement, such as it is hoped will never see the light of day again.

On the other hand, and at the same time, was the most wonderful performance of the 19th Hussars (155 strong) mounted on Syrian ponies; an example of the most efficient care of animals almost on record. With an average daily

ration of 5 to 6 lb. of grain and two gallons of water, for 10 days they marched 31 miles daily. At the first advance on Matammeh they marched to the Nile without having received a drop of water for 55 hours, and only 1 lb. of grain. During their halt at Gubat from 20th January to 14th February, they were fed on 10 lb. dhourra stalk daily, and on their return journey to Korti the first 75 miles of the journey was performed on 4 lb. grain and three gallons of water. The horses were allowed to graze on every possible occasion on the grass of the Bayuda Desert, but it was very dry and they ate little. Out of the 155 animals 19 died or were destroyed for debility or exhaustion, five from other causes, and 20 were killed in action between the 8th January and 8th March.

The wastage in the South African War has already been alluded to, and by far the greatest amount was due to Debility and Exhaustion, the war being very considerably one of movement and trekking. It simply swallowed up animals; and replacements, being so unfit, never had much of a chance from the outset. North American animals, though good, were the victims of operations in a country of reverse seasons: Argentines were grass fed animals in their own countries, and missing their beautiful alfalta and being unaccustomed to grain and to feeding out of nose-bags, quickly went to pieces: Hungarian horses were, and are at their best, "flatcatchers" and also are grass fed in their own country: Russian cobs for mounted infantry purposes, at least those from the Urals, being a tough lot, weathered the storm: the London bus horse, full of good hard English keep, rendered a good account of himself: but the native of the country was the hardiest of all. Truly it was the survival of the fittest. I call to mind a reconnaissance of Plumer's Force, when, mounted on South African ponies, 70 miles were covered in 26 hours and not a single animal dropped out, and this during the season of "Horse-sickness." Also, after over a year of hard campaigning, 30 per cent. of the original ponies of his Rhodesia Regiment were handed back to the Remount Department when the regiment was broken up. It is an example of the fitness of animals that are required for the hard usages of a war of movement.

To chronicle in detail the wastage under this heading which has existed in our numerous campaigns, and the causes which have led up to it, in itself would fill a book. There is admittedly a large proportion of Debility in active warfare which nothing can prevent. Animals as well as ourselves have their nervous systems, and there are delicately constituted animals which no horse-master can keep in condition, and which from necessity find their way into the ranks of the best horsed army in the world. Moreover, there are times when the military situation absolutely prohibits the bestowal of that due amount of attention in watering, feeding, and general care, which is so essential to the well being of the animal.

Let us now see what happened in the greatest of all wars, at least in the Western Theatre in France, where long forced marches were of rare occurrence, but where battle in all its fury, exposure, terrific toil, and at times reduced ration existed.

The Somme Offensive of 1916 left us by the December of that year with 16,074 Debility (poor condition) animals under treatment in Veterinary Hospitals and Convalescent Horse Depots. [*Note.* Our policy, as previously explained, was early evacuation as far as the situation admitted, and Convalescent Horse Depots are essentially for the recuperation of animals in impoverished condition.] Of this number 3,386 were riding horses, 9,211 were light draught horses, 2,825 were heavy draught horses, 248 were cobs and 404 were mules. The strength of the Force was then 354,217 horses and 62,914 mules, the percentage Debility (poor condition) therefore being 4·54 per cent. for horses and ·64 for mules. The figures illustrate finely the wonderful resistant power of the mule, and he was equally good at recuperation. At the same time it is evident that when the working ration is reduced, the small animal will continue effective when the larger animal fails. The light draught mule 14·3 to 15·2 received the same ration as a light draught horse. The cob was conspicuous by his absence from Veterinary Institutions at all times.

In 1917, during the first fortnight of February operations were at a standstill, and though the weather was cold the wastage from Debility was low, only 1,678 cases for the two

WINTER IN FRANCE.

weeks being admitted. From the 15th February to the 31st March the weather increased in severity, there was more movement of troops and a corresponding increase in the cases of Debility, 3,639 being recorded for the last two weeks of February, and 9,427 for the month of March. During April and particularly during the first two weeks (including Easter week) the bitterest weather conditions prevailed. Unfortunately too, an enforced reduction of ration had for some time previously existed, and with 195,000 animals engaged in the very arduous offensive operations in front of Arras at that time, the toll of Debility and Exhaustion rose to an unprecedented degree. 20,319 were admitted during the month.

With the advent of better weather, diminution of work, and an augmented ration, the admission during May and June dropped to 3032 and 1253 respectively.

This represented the period of our most serious loss from Exhaustion and Debility. Conditions of service at the front and the strain to which animals were subjected were practically indescribable, and not the least of our enemies was the appalling weather which prevailed during that Easter time, as if the God of all Hosts rose up in rebellion against the very name of War perpetrated by Man.

We found also at that time, on making post-mortem examinations of animals dying from debilitating and exhausting conditions, that Gastro-enteritis was common, a severe gastric ulceration sometimes existed, similar in a marked degree to the mouth lesions of Contagious Vesicular Stomatitis which appeared amongst our animals in the early days of 1917, the intensity of which was increased rather than diminished by the severe cold of the winter and spring. In one month alone we had 2596 cases of this disease under treatment in isolation in Veterinary Hospitals. Its gravity lies in its extreme contagiousness, and the loss that occurs in the condition of animals from their inability to feed. It was only through the greatest vigilance on the part of Veterinary Officers, with isolation of cases, and separate watering arrangements by means of water buckets and improvised small watering troughs made from mens' ground sheets, that the Front could be kept clear; and there is no doubt that this very ugly disease played a considerable part in the wastage of the spring of 1917 from Debility.

Age in relation to wastage. The rule of the Army used to be that only horses between six and twelve years were to be sent on service, and fifteen years and over was the age for casting. As the late war progressed, extending into over four years, animals naturally exceeded the accepted useful ages, but it is a point to be noted that animals of advanced years stood the campaign wonderfully well, and the maximum age limit of twelve years can certainly be expunged in favour of an open question. Some of the old trained horses of Cavalry have a remarkable record, and have stamped themselves as real tough warriors. Record was kept of the ages of all horses evacuated, and it was found that this ran about 11·5 per cent., gradually coming down in 1918 to under 10 per cent., for animals fifteen years and over.

Battle Casualties.

In campaigns previous to the late war, excepting perhaps in Cavalry charges, the casualties in animals from actual gunfire was in small ratio to other causes of wastage. I therefore pass them by, and come immediately to modern times, and a consideration entirely of the wastage in the principal theatre of the recent Great War.

During the first two years of the campaign in France, battle casualties were extraordinarily low. This was largely attributable to the stationary nature of the warfare, and the lesser power of Artillery and other elements of destruction.

With the advent of offensive operations of the summer of 1916, the enormous increase of Artillery, and the development of bombs and gas, casualties correspondingly increased, and loss became heavy.

By the careful selection of horse lines and splitting up animals into small groups, Unit Commanders were able to minimise the effect of hostile fire very considerably.

Aerial bombs were responsible for a large proportion of the battle casualties, and their effect was combated with a considerable measure of success by the erection of mud walls, five feet high, round horse lines and stables, and by anti-bomb traverses within stables. A bomb in its action bursts low, and many broken legs and abdominal injuries were saved by anti-bomb walls and traverses.

The following table of killed and wounded, giving periods and operations, will aptly show what a struggle between Great Powers under modern circumstances of war really means :—

	Gas.		Gunshot: Bombs.		Total.
	K.	W.	K.	W.	
1916 : 1st July to 31st Dec. Embracing the battles of the Somme and Ancre	33	352	3941	6063	10389
1917: Jan. Feb. and March Not marked by severe fighting			771	1260	2031
1917: April Operations in front of Arras			2070	2555	4625
1917: 1st May to 27th Oct. Messines and operations in Belgium	68	1138	10590	25258	34054
1917-18 : 28th Oct. to 16th March Operations at Cambrai	6	33	4096	8869	13004
1918: 17th March to 14th July Period of great hostile offensive	78	451	14122	13154	27805
1918 : 15th July to 11th Nov. Period of great Britsh offensive	26	246	22500	23251	46023
Totals	211	2220	58090	77410	137931

An accurate account was kept of bomb casualties as against gunshot, and it formed a very good guide as to German aerial activity and strength, and to our aerial supremacy. From records of casualties the zenith of German aerial power would appear to have been reached in August and September 1917 when bomb casualties in animals amounted to about 400 per week, and though the enemy left the Front considerably alone and gave the back areas a dusting in May 1918, the casualties were week by week on the wane, and in October 1918 before the Armistice they only amounted to about sixteen per week. It was a singular fact that with the exception of one instance, when the crow was hit instead of the pigeon, Veterinary Hospitals on Lines of Communication received no damage from enemy bombs.

The introduction of gas warfare was met by the provision of horse respirators, but such provision was more costly than the loss sustained. It is more important for the men to adjust their own respirators than those of the horses, and by the time the latter is effected damage may be done to the animals. Animals are more resistant to gas than men, but in any case the best policy is to clear out of the gas area. Respirators are of course of no value against the mustard gas. Avoidance of pools of water (blistering of lips from drinking) and of traversing land on which it was noticed (blistering of heels and legs) were precautions taken.

Accidental Injuries.

Under this heading are included wounds other than gunshot. Kicks, contusions, fractures, sprains, rope-galls, saddle-galls, harness-galls, and lameness from various causes. Treated as a class they are very largely preventable, and their limitation is in direct relation to the knowledge and attention displayed by Unit Commanders and others to whom animals are entrusted. It is very satisfactory to record that during no period of the war in France did this class of wastage present any serious proportion—with the exception perhaps of the inefficiency resulting from "picked up nail" to which I will specifically allude—and I think the small amount of preventable injury there met with reflects very creditably on the general animal management of the Army. Certainly the simple knowledge which has been gained in our various schools and classes has borne good fruit.

Sore back. In days gone by, the inefficiency on campaign from sore backs, both in Cavalry and in Transport, was dreadful. With the exception of contagious disease, it formed the chief item of wastage and inefficiency. The history of the majority of frontier expeditions in India reeks of sore back in Transport. In the Egyptian Campaign of 1882, out of a total of 1982 horses, though there was comparatively little marching, there were 517 cases of sore back of which 21 had to be destroyed. In two months one British Cavalry Regiment had 76 sore backs, and in another there were 89 in one month. Reports of sore back in camels during the Nile Expedition of

WITHIN RANGE—"PACKING" SHELLS.

1884-85 were very pitiable. There was 8 per cent. of inefficiency from this cause on assembly at Assouan—a very bad start, and the subsequent tale is one of saddles literally sitting into animals' backs, bones exposed, maggots, saddles not removed for days—a dreadful picture of wastage.

In the Somaliland Field Force of 1903-4 the sore backs from the native substitute for a saddle, "Herio" (a series of mats) was appalling.

Even in present times there is a considerable amount of sore-back in mule and pony Pack Transport and in Camel Corps on Field Service in India.

Whenever there is intelligent supervision there will be a minimum of injury. It is the duty of Commanding Officers to inspect the backs of their animals daily as a routine, the cause of any little rub being defined. The panel of the saddle is the book to read, and every gall has a definite cause which, with the exercise of intelligence, can be remedied. But it yet remains for a suitable *palan* or camel saddle to be devised. The camel is living in anticipation of some fertile sympathetic brain producing the necessary blessing.

Perhaps no greater factor in the reduction of saddle and harness galls exists than the small War Office publication "Animal Management." All the seats of galling are explicitly shown in the chapter relating to saddles and sore backs, and it will repay study.

Rope-gall. I particularly mention this injury in view of systems of picketing animals. Invariably injury is to the hind heels, and it is caused by the animal getting entangled in the slack of the head-rope attached to picket line. The injury was most infrequent in France because the picket rope was stretched between wagons or attached to posts. In other words, the picket rope was breast high, the slack of the rope avoided, and fear of entanglement and gall minimised. There was no necessity for hind shackling under this method, and as a rule animals learn to stand quietly.

In India, the common system of picketing, except in Artillery, is a ground rope to which animals are attached by their head ropes, and to keep them straight hind shackles are

necessitated. The weight of transport of these shackles, and particularly the iron chains in the aggregate is enormous, and represents an addition to loads either on the animal or in carts which could easily be abolished. Even in peace, in stables in India the system of *Agari-pichari* continues; it could stand modification with advantage.

Lameness. The amount of lameness from sprains, bone diseases—such as spavin, ringbone, and arthritis, during the war in France and Belgium was extraordinarily small. The Army was maintained as sound as possible; any unserviceable animals were either cast and sold to agriculturists or for food, or were utilised for the slower and less arduous work on Lines of Communication. The latter category was designated V.B. (Veterinary Base).

Mules as a rule are wonderfully sound, and it is surprising how well they do without shoes. A Mountain Artillery Commander would scoff at the very idea of his mules being shod. Unshod they have sure foot-hold. The pack and draught mules of Transport Corps work unshod, with splendid results. Even ponies can do, at least, without hind shoes. But it all depends on weather. In wet weather there is greater maceration of horn, and so in France the draught mules were shod.

On the frontier in Waziristan, from work along the stony river beds, camels have suffered considerably from sore feet, and various protective expedients have been tried. Camels parked on stony ground also suffer from bruises and wounds of the chest pad, and unless care is exercised in the selection of camping grounds a good deal of inefficiency and loss is occasioned thereby, for such cases are difficult to cure.

Picked-up Nail. A curious form of inefficiency which bulked very largely in the returns of the B.E.F., France, was what was termed "Picked-up-nail," and all sorts of expedients, amusing and otherwise, were adopted for its prevention. Nails appear to have a peculiar attraction for horses feet, and the nuisance was not confined to nails, for an occasional live cartridge would be found. There was no record of any bird's nests such as rumour attached to the tails of certain horses purchased during

the Zulu War. However, joking apart, from the winter of 1915-16 the occurrence amounted to 400 per week, in spite of Routine Orders—which are apt to go in one ear and out at the other; beautiful attractive red boxes with the word "Nails" painted in pearly white, stuck up on the walls of villages; posting bills of photographs of nails with witty remarks vying with the attractive boxes on the walls, and "Nail Hunts" by units in the vicinity of the Camps, which afforded great amusement after the manner of football. Competitions in "hunts" would appear to have been started in one sector of the line; one unit was credited with 12 lb. of nails in one hour, but whether the finals were ever played off, history does not relate. I fancy they were deferred by the Armistice to the next War. But the nail went on. His name was legion. It was the business of the man attending the "Cooker" marching along the road and using packing cases as fuel, to see that the stew was appetising. It was another man's job to look after the nails that dropped into the fire-box or on the road. The same with the builder of huts or stables. The seriousness of the matter lay in the large number of "Quittor" cases for operation in Veterinary Hospitals.

I will close remarks under this chapter by a brief reference to:—

Dietetic Diseases. Apart from the loss resulting from Debility, with reduced rations as a contributary cause, wastage from digestive disorders was comparatively slight in the Army in France. On one occasion there was serious poisoning from an admixture of Castor beans amongst the oats, the vessel carrying oats in bulk having, without doubt, previously carried castor beans as part cargo, and in the hurry of requirement not having been properly cleaned out.

There was also occasional poisoning from feeding on certain Linseed cakes, from the development of prussic acid, but this can be, and was, avoided by boiling the cake.

Sand Colic amongst units located on the dunes along the coast of Belgium was very prevalent, and expedients to prevent animals from eating sand had to be adopted. It was a long time before animals got over the effects of sand, and it was a noticeable factor of Debility. An alkaline sands appeals to animals,

and particularly when appetites are depraved or sharpened by want. It was no uncommon sight to see animals eat sand as if it was a bran mash, Sand Colic and its prevention formed the subject of special instructions, and in the matter of expedient for prevention I think there was little left to the imagination. Space will not admit of a description of the many devices.

Contagious and Specific Diseases.

Of all the causes of wastage the contagious element of disease is by far the most serious and important. Communicable diseases in animals are so numerous and varied in their character that they demand of Veterinary Service the utmost vigilance and the most profound skill it can command through its officers in prevention, control and suppression. An exact knowledge is required of all contagious Diseases, and the life history of their causal agents scientifically put into operation the means of combat. It is *par excellence* the Veterinary Officers' War. The study of Contagious Disease is an absorbing and fascinating one, and with full knowledge of cause and effect the *modus operandi* of control becomes easy to the expert. In War the badness of things always asserts itself, the hand of control is by force of circumstances slackened, and the vast movements of men and animals conduce to the spread of evil elements. There are also new "bolshevics" of disease that spring up as specifics in our midst, of obscure origin, that bother us intensely at the moment, and then disappear as mysteriously as they came. It is a funny World! The World's a stage in more ways than one, and we are actors. When contagious disease "takes the floor" we have to be pretty quick actors and to know our parts.

Glanders and Farcy.—Enter; The old Napoleon that scourged Armies—killed by a Staff College graduate, Mallein, that has the prescient faculty of nipping operations in the bud and diagnosing the situation before danger arises!

Through the agency of Mallein we now have no trouble with this disease. The latest method of Testing for the detection of Glanders in its latent form is by the injection of special Mallein into the lower eyelid. A reaction indicating disease is easily detected, no temperature taking is necessary, and animals can perform their work while under the test—a very important

matter on Active Service. Our policy is to test all animals on admission to Veterinary Hospitals and Remount Depots, and in the event of reactions to refer back to the unit to which the reactor belonged for test to the unit. Reactors, though showing no outward signs of disease, are destroyed.

In the autumn of 1915 the frequent reactions encountered in animals evacuated from the front in France indicated a certain menace, and it was decided to test the whole Force. This was done during the winter, about 300,000 animals being subjected to the test. The disease was cleared out, and even though we were again threatened on the arrival of the Portuguese Expeditionary Force in the spring of 1917, and by a few cases on the return of a Division from Italy, we had no more trouble. The total numbers of animals affected were 85 in 1917 and 36 in 1918. Thus has an old enemy been defeated.

Epizootic Lymphangitis. (A name as long as its period of incubation, but may be lovingly referred to as "Epizoo.")

Considerable loss and inefficiency have been caused in certain Countries and Expeditionary Forces through this serious affection. Its seriousness lies not in its mortality, but in its infectivity and its long incubation of 2½ to over 4 months. It was introduced into the French Army during the late war by their Algerian Troops, and they had many cases. Their policy was to treat those with a commercial value. Our policy was eradication by destruction—a cheap policy in the long run, and moreover we had to consider the very important matter of its exclusion from the British Islands on the return of our Force. It is satisfactory to record that not a single case has been introduced into the United Kingdom

Though beset by it in France we escaped until 14th September 1917, when our first case occurred. Altogether we had 202 cases ; they were mostly sporadic, and only in one instance did it assume anything like grave proportions—in a Regiment of Household Cavalry in which 80 cases occurred. The Regiment was drawn out of the line for isolation until it was successfully eradicated. Its eradication was due not only to destruction of the affected, but to the use of a special *pro forma* report which covered enquiry as to source and action taken.

Another similar disease, and affecting the legs of animals chiefly, was what we termed *Ulcerative Cellulitis*, or as termed by the French, *Ulceratvie Lymphangitis of Nocard.*

This is a mud-borne disease, and it gave both the French Veterinary Service and ourselves a lot of trouble. Treatment was by specially prepared vaccines, or by antiseptic applications: but the disease is most intractable, liable to burst out again, and hope of success lay only in the milder cases evacuated early. Of these we calculated to cure 50 per cent. but 25 per cent. of apparent cures recurred. The French affirmed that 15 per cent. were curable. The disease is a very ugly one; it affected some of our best draught horses and necessitated a considerable number of destructions.

I have previously alluded to the churned up mud of Flanders. Picture hygiene in a comparatively small area in Northern France holding say 450,000 animals for nearly four years, each animal excreting say 32 lb. of dung and 10 gallons of urine daily. The soiling of the ground and liability to infective mud-borne diseases can be readily realised, and our difficulties appreciated. The wonder is that loss was not heavier from this class of disease.

Another disease which gave us great concern in France and also undoubtedly one of insanitation, was :—

Specific or periodic Ophthalmia. The ailment made its appearance in France in March 1917, and by the end of the campaign its victims ran into thousands. By February 1918 incidence, including recurrency, ran up to 1·4 per cent. of strength, and then it somewhat abated.

The disease is not new, in fact it is the old "Moon Blindness" of the coaching days. It occurs also in dealers' stables, Remount Depots, and commercial stables sporadically in ordinary times; but it is left to war, in which large numbers of animals are employed, to disclose real intensity.

A more or less similar condition was experienced during the South African War, and I think nnder any protracted war the same result will follow.

The disease is an iritis, recurrent, and ends in blindness either from "Cataract" or disorganisation of the eye. It is

not contagious in the ordinary acceptance of the term, *i.e.*, directly from animal to animal, but it is microbial, and its menace lies in our ignorance of the life history of the causal agent, and in its incurability. A young officer of the R.A.V.C. has separated an organism from the optic nerve, and inoculations of cultures have produced the disease. Moreover, growth of the organism on broth emits the most pungent stable smell, which makes me think that investigation is on the right track. It is to be hoped that correct issue will follow investigation because, as I have previously explained, before a contagious or specific disease can be successfully tackled and suppressed, the strategy and tactics of the enemy in all his subtlety and insidiousness must be fully known. We are at a disadvantage when this is not so.

It is an interesting fact in regard to this disease that animals on becoming stone blind grow fat. Perhaps it is a case of "what the eye never sees, the heart never grieves," or it may be a physiological process of the same nature as the fattening of ducks in a dark cellar. Certainly some of our best horses in France were blind, and at a Horse Show on Lines of Communication a pair of blind horses was awarded first prize as the best wagon team. Blind horses could be employed in certain units in forward areas, but as a rule they were afraid of gunfire. The sadness of it was that so many otherwise splendid young horses were victims.

Respiratory Disease and Sea Voyages. The purchase of Remounts, particularly young horses, and their transportation by land and sea inevitably leads to outbreaks of disease of a respiratory nature—Strangles in the young, Catarrhal Fevers and Pneumonias of the Influenzal type in all. And unless the utmost care is taken in selection, in separation of sick, and in the movement only of those that are fit and well, loss will be heavy. Horses are delicate creatures in a matter of Influenza or Catarrhal Fevers. They die very readily.

In the United States of America—a country of stock yards, the liability to "Stockyard fever" which is a respiratory disease of an influenzal nature, is very great. Over 70 per cent. of animals purchased were reputed to have contracted Catarrhal Fever in varying degree, and though I have no

figures to guide me, the loss, no doubt, was heavy. The only way to handle a situation of this kind is to get animals into proper hygienic reception depots as soon as possible after purchase, and to hold them there quietly for some time prior to shipment from embarkation depots, to ensure that they are over their sickness or free from it before undertaking a sea voyage. Any sickness of this nature on board ship is serious.

I have had considerable experience in this particular duty and I know no more difficult matter.

In France in the winter of 1914-15 sickness and loss amongst the class of heavy remounts was severe. The weather was extremely wet, covered accommodation was difficult to find, and depots took a considerable time to build. Fever, Catarrh and Pneumonia prevailed. Later on, as conditions improved and accommodation was ample, and after a policy of holding animals in Remount Depots for as near three weeks as possible was instituted, wastage from respiratory sickness became negligible. Temperatures were taken on arrival from overseas, and if fever was indicated, animals were immediately transferred to Veterinary Service. Respiratory Diseases at the Front during the last two years of the war were practically *nil*, or at all events were very infrequent. The suppression of these maladies showed that the system of inspection and control by Veterinary Service in Remount Depots was efficient, both in the United Kingdom and in France.

Mange. I leave to the last our hardy annual, our bosom friend and self-constituted ally. There never was a War without him and never will be. He is permitted often to go about an Army in a familiar "Old chap" sort of style, and he even has the assurance to present himself at Armistice, and participate in celebrations of victory even though he may be downed in defeat. He is covered with Orders (Routine Orders) and bears the scars and wound stripes of many campaigns and conflicts. Unlike other Commanders in the Field, his best operations are conducted in the Winter, the dirtier the conditions the better; and his leave season is in the Summer. The rise and fall of his fortunes in France can be best and most readily appreciated from a scrutiny of the accompanying charts.

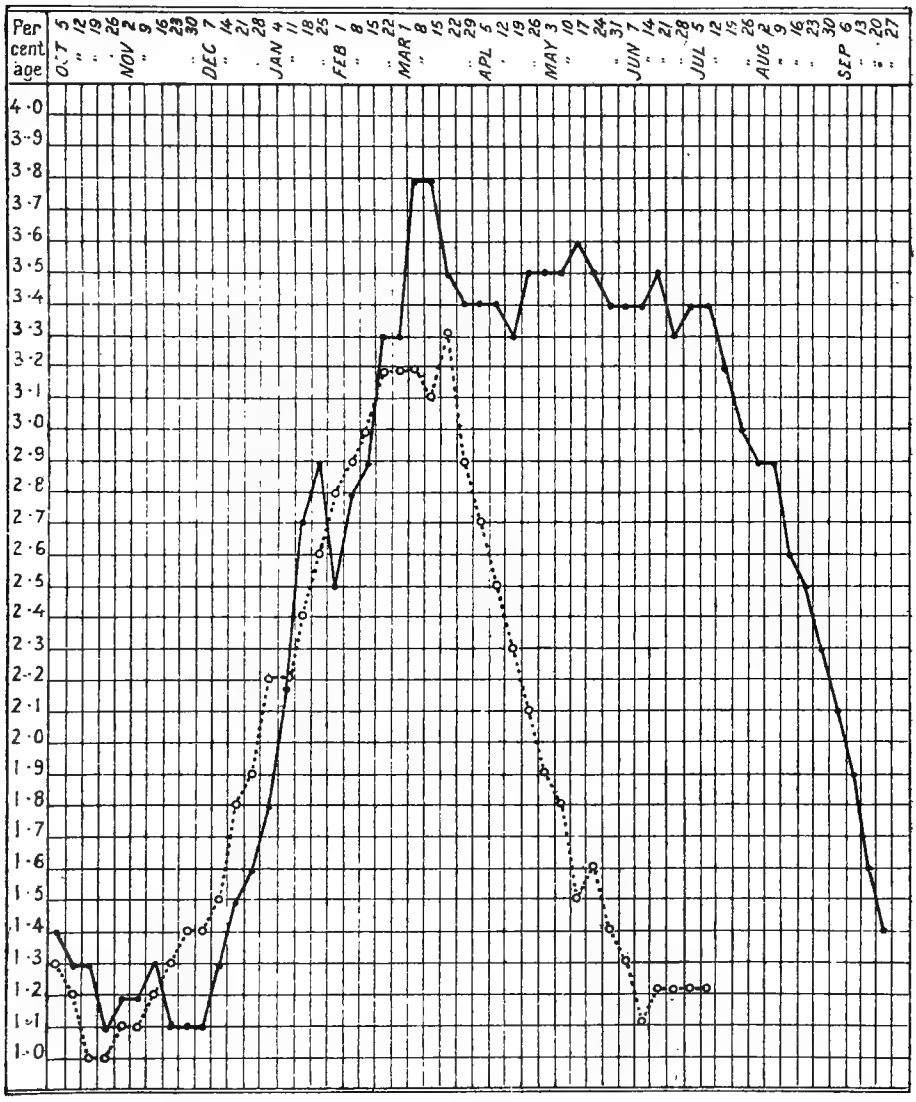
MANGE. A DIPPING BATH IN FRANCE.

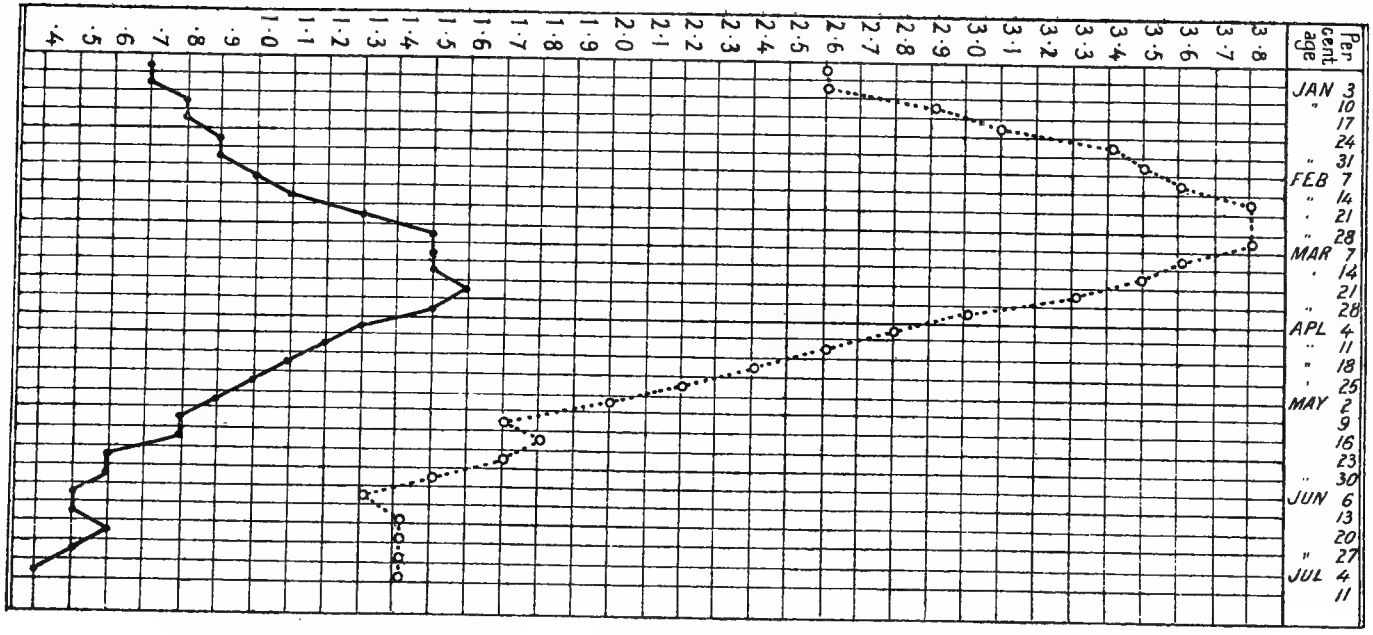
Veterinary Service, B.E.F.

Mange Chart (A), (Horses and Mules combined).

Solid line—Percentage of cases each week from Oct. 1916, to Sept., 1917.

Dotted line „ „ „ Oct., 1917, to July, 1918.





VETERINARY SERVICE, B.E.F. Mange Chart (B). (Horses and Mules separately.)
Dotted line—Percentage of cases each week from Jan. to July, 1918, among horses.
Solid line " " " " " " among mules.

In the first twelve months of the war in France Mange was almost entirely excluded, but as the Army increased and supervision became more difficult outbreaks were more frequent. It will be seen from the charts that incidence went up in the winter to 3·8 per cent., which was the highest experienced, and down during the summer, with the casting of coats, to 1 per cent. The chart of 1918 is interesting in showing the relative incidence between horses and mules, the highest occurrence in the latter being 1·6 per cent. in winter and down to ·4 per cent. in Summer; thus mules were at least three times less prone to Mange than horses. These percentages included all cases, serious and slight, and all were sent down to Lines of Communication for treatment. The amount represented in the aggregate a considerable number of animals out of action, but considering the difficult circumstances, and looking at incidence from a percentage point of view, total inefficiency from this cause cannot be rated high in an animal parasitic disease, and in a war where so many animals are congregated together. Mange and Debility are usually associated, and though the former may be cured, the latter delays issue. Animals are out of action from one to two months. Our treatment was by immersion every few days in warm Calcium sulphide solution in large Dipping Baths, and proper grooming. Corps had their dipping baths for prevention.

I regret to say that Mange (Sarcoptic) is very prevalent amongst camels in India, and on Frontier Expeditions it occasions considerable wastage and loss of efficiency. The association of Debility and Mange in intensified in this animal. So large is the amount in Civil districts that purchasing officers have experienced a difficulty in purchasing clean animals, and those with slight Mange have had to be accepted. The only course is to erect Dips at centres in Civil Districts and dip animals in the same manner as sheep. Camel Dips have been in use during the recent Waziristan Expedition with great success; and with periodical dipping, camels slightly or not too badly affected have been able to carry on their work. Dips are now being erected even in Eastern Persia.

The total occurrence of Mange in camels employed by Government for the year ending 31st March, 1920, numbered

9910 cases, so that it is most necessary that measures of control should be more exact.

In the Somali Field Force of 1903-04 there were 3137 cases of Mange and skin disease in camels from July, 1903, to March, 1904, out of a strength of 9466 camels and mortality was severe. A Mange Bath was used with great success, Perchloride of Mercury solution was used.

In the Kurram Field Force, during the winter from November, 1879, to March, 1880, nearly every camel employed suffered from Mange. It spread with great rapidity, but disappeared in the spring.

In the Tirah Expeditionary Force of 1897-98, from 1st Oct., 1897, to 6th April, 1898, with a force of 74,000 animals, there were 4819 cases of Mange, 1501 being in ponies and 1901 in camels. The strength in camels was 12,257 and ponies 16,046. There were only 617 cases in mules out of strength of 15,328 and 409 cases in donkeys out of a strength of 13,854. Again we see the relative immunity of the mule and donkey as compared to horse kind. The records of Frontier Expeditions all show high incidence in Winter and little in Summer.

Chapter IV

WASTAGE PECULIAR TO INDIA.

In order that I may remark more particularly on certain grave contagious diseases prevalent in India and their bearing on the Army, I have deemed it necessary to group them under one heading. The dire diseases to which I refer are Rinderpest and Foot-and-Mouth Disease in Cattle, Surra in Camels, and Anthrax in various animals.

The history of these diseases and the dead loss sustained not only in the Army but in Civil Communities has been and still is appalling, and the machinery of control is most inadequate and imperfect in operation. One would have thought that with the mass of contagious animal disease of all kinds in India, worse by far than any other country that I am acquainted with, one of the first considerations would have been a properly constituted

A Case of Mange—Before Treatment.

After Treatment.

Contagious Diseases Animals' Act to suit the necessities of the country, but such is not the case, and animal life continues to be wasted. It is not for me to criticise policy, but I am all out to assist in the grading up of animal efficiency and in the reduction of wanton, unnecessary animal wastage and suffering. It is a duty that is put upon me. I am, however, now pleased to say that a simple Diseases of Animals' Act, India, with Orders in respect to the various Contagious Diseases is to be considered. The very fact of such an Act and Orders being in existence in the land of "Hukm" in itself will be productive of great good, and its application can easily be made adaptable to the circumstances and the needs of the country, generally and locally, and to the susceptibilities and customs of the inhabitants.

It is quite certain that no Commander in the Field using Bullock Transport—Government or Hired—can get very far without being faced with outbreaks of Rinderpest and Foot-and-Mouth Disease in these animals. It is our experience on all Frontier Expeditions, examples of which I will presently give. The bullock is much more suited to the quiet life of cantonment work in peace, where he can rest from his easy labour under a tree in the heat of the day, and combine rumination with nice thoughts of his Valhalla, than to the hardships of a campaign which, unless care is exercised as to his *locale* of duty, would be a perfect hell to him. Southern bullocks, *e.g.*, the Mysore breeds, and Sindhi, coming to Northern climes, are much more susceptible to Rinderpest and Foot-and-Mouth Disease, and they are attacked in more virulent form.

In slaughter cattle, goats, and sheep, it is also quite impossible to avoid outbreaks of these two diseases unless there is a better system of organised Veterinary control of inspection, purchase and movement, and even then the situation is difficult. Judging from losses from disease and from exhaustion and inanition entailed by marching meat on hoof, it would be more economical in the long run to adopt a cold storage policy. And in connection with the supply of meat on hoof I may relate a circumstance that occurred in France. Most of the sheep for consumption by Indian Troops were purchased in Algeria, were landed in Marseilles and held in various Communes in Vacluse

and Bouche du Rhone before being sent by train to the troops in the North of France. Sheep Pox (French *Clavelée*) is enzootic in Algeria, and French law necessitates clavelisation or inoculation against the disease on importation, The hand of control as I have previously explained is apt to be relaxed during war, some loophole exists (*e.g.* introduction of Rabies into England in 1918) and disease escapes. Sheep pox broke out amongst the sheep held in Vacluse for Indian Troops, and Officers R.A.V.C. in conjunction with French Communal Veterinary Officers were called in to clavelise the whole of the herd of 10,000 sheep. I mention this as an instance of the danger of moving slaughter stock on hoof, and I must say that, in the face of such danger, the French Ministry of Agriculture were extraordinarily good in raising no objection to the procedure, and in its kind consideration of our Indian Troops.

Rinderpest. India is the home of rinderpest. The country is full of this disease, and thousands of cattle are lost annually from it. It was introduced into England in 1863, and cost that country millions of pounds. It also spread through the whole of Africa from North to South some twenty-five years ago, and occasioned very heavy mortality. Though the virus or organism is so small that it is ultra-visible to the highest power of a microscope, and can pass through the closest grained porcelain filter, still we know that it perishes outside the animal's body in from forty-eight hours to four days, and this factor greatly assists us in control. Moreover, a serum confers an immunity to cover the purposes of an outbreak and a further dual inoculation with such serum and virulent blood will confer a permanent immunity. So that I am sanguine by the latter method we can render all animals in military employ durably immune, and reduce our trouble and loss. This is now in operation in the Army. It cannot be carried into practice in Civil Districts, as it is really conferring the disease, though in mild form.

Foot-and-Mouth Disease. The disease is very common in cattle all over the World, and constantly crops up in India. It is extremely contagious and unfortunately one attack confers immunity only for about five months. No one has yet

demonstrated the causal organism; it also is ultra-visible, but it is fragile to ordinary methods of disinfection. There are no means of inoculation against the disease.

Examples of Rinderpest and Foot-and-Mouth Disease on Active Service :—

Expedition.	Rinderpest.	Foot-&-Mouth Disease.
Chitral Relief Force, 1st April to 31st Aug. 1895.	1803 cases, 1297 deaths and destructions out of 6363 animals. Was also amongst country cattle.	3675 cases, 151 deaths, 95 destructions. Average time under treatment 10 to 14 days.
Tirah Expedition Oct. 1st, 1897 to April 6th, 1898.	982 cases. 524 deaths, 43 destructions out of 13727 animals.	1378 cases. 45 deaths, 3 destructions, out of 13727 animals.
Tibet Mission, 1904.	Very prevalent.	Great number of cases.
N. W. F. F., 1919. From May 1919 to September 1919.	Approximately 400 cases. Average strength of bullocks, 3676. A considerable number of deaths amongst slaughter cattle.	778 cases. Average strength in bullocks, 3676.
Waziristan, 1919-20. From June 1919 to May 1920.	650 cases. 430 deaths. Average strength, 9700 bullocks.	2430 cases in two outbreaks, one in June 1919 and the other in Feby. 1920. Average strength in bullocks, 9700.

Out of 3000 yaks (3 Corps) only 70 remained; the rest had died from Anthrax (385 cases) Rinderpest, Foot-and-Mouth Disease, Pleuro-pneumonia Contagiosa, Debility, from too low altitudes, and "Missing."

Anthrax. Grass Farms and clean supply of forage have tolled the knell of Anthrax in India. Outbreaks in the Army are now very infrequent. We have had during the past year a few isolated cases amongst camels in the North West Frontier. In comparison with this the record of the Kuram Force of 1879-80 is of great interest. During the months of July, August and September, 1880, 1400 camels died from this disease at Kuram and Shalozan, 217 on the road between Kuram and Thal, and 61 at Thal.

The Yaks of the Tibet Mission lost 385 from the disease

The seriousness of the disease, apart from mortality, is that the land on which animals have died and blood has been spilt, remains infective for many years, and if grazed on, say after rain, a recrudescence of the disease is apt to occur.

Surra. (The word signifies "rotten" in the vernacular).

Until within recent years we had no records of the incidence of, and mortality from this disease in the Army; and Civil reports and returns throw absolutely no light on the subject. In Frontier Expeditions a large number of camels were hired and were replaced by contractors if they died, and the closing of their account by compensation was of much more importance to the owners than any fine definition of the maladies by which they were spirited away. I should say that a good deal of the Debility and Exhaustion of camels in former days was really Surra, and in all probability this disease is at the root of a considerable amount of the Debility (poor condition), pneumonia, skin and other diseases encountered in these animals at the present day. The causal agent, a protozoon living in the blood and destroying it, was only discovered in 1880 (by an English Army Veterinary Surgeon, who was the first man to demonstrate Trypanosomes) and the disease in essence is a pernicious anæmia—a wasting away, and death. Affected equines die in from one to two months; camels, in which it is usually chronic, may live to three years and over. The factors concerned in the spread of the disease are diseased animals, constituting reservoirs of the infective agent, blood-sucking or biting flies as inoculators, and susceptible animals into which the inoculators transfer the infective agent mechanically. It is a very simple process so far as we know, and these factors very materially guide us in control of the disease. The disease so far as our present researches go is incurable—at least in the practical domain of treatment. So serious has the Surra situation become in recent years that a Standing Surra Committee has been appointed at the instance of and under the direct guidance of the Civil and Military Administrations, and their efforts bid more than fair to achieve very happy results, which will not only preserve the camel—which is the principal animal concerned, from deci-

mation, but incidentally will save a large amount of loss to the State. Personally, I am very sanguine as to the successful issue of measures which have been instituted, and under them I am very optimistic as to the future of the camel of India. If there is co-operation between the Civil and Military Authorities in the closing of the fountains of the disease as circumstances of disease dictate, if ways and means of destruction or avoidance of the prime factor or inoculator can be adopted, and better care be taken of the susceptible creature, there can be no fear of any other issue than success.

For generations the camel has been shrouded in mystery—a mystery "Ship of the Desert," and his management surrounded with the grossest ignorance and empiricism which in certain localities still does not rise beyond the level of smelling or tasting his urine when he is sick, and covering his sores with filthy dung. Poor creature of Dirt, no other wonder he is "rotten"! Yet he is a domesticated animal required for work, and as such he must be treated if he is to take a permanent place as an Army animal for the hard work of Frontier warfare. And it is the duty of enlightened people to remove him fom a lot that threatens his very existence. It grieves me very much to quote statistics of wastage from Surra during the past few years, but they will serve to show the urgent necessity for action on the one hand, and the remarkable result of altered policy in respect to the management and feeding of camels on the other.

In the year 1917-18 (ending 31st March) there were 9262 cases of Surra amongst animals in Military employ, of which 4181 died or were destroyed; 89 were horses and ponies, 26 were mules, 2 were buffaloes, and the rest camels. The total number of camels employed was 16,189.

In the year ending 31st March 1919 there were 2106 cases of Surra admitted, 2143 deaths and destructions, including a few remaining from the previous year, of which 44 were horses and ponies, 13 mules, and the remainder camels. The total strength of camels was 18,743.

In last year, ending 31st March 1920, there were 984 admissions for Surra, of which 971 were camels, with 550 deaths and destructions, of which 537 were camels. 29,097

camels were employed. Practically during the whole of last year the camels were on Active Service; they were stall-fed, and treated like other Service animals. They were not exposed to biting flies in grazing *rukhs*, and excepting a few that were transferred to a Surra Corps, which worked in isolation a long distance from other Corps, diagnosed cases of Surra were destroyed. It is a remarkable drop in mortality, and it speaks volumes for stall-feeding of camels and attention to stable management, and with the general policy pursued this year it is hoped that losses may be still further reduced.

During the fly or Surra season, camel units are charged with the duty of collecting biting flies (*Tabanidæ*), their larvæ and egg-clusters, from shrubs and blades of grass in the vicinity of their animals' drinking water. But what can be practised in Government Camel Corps is difficult to carry out in Silladar and Grantee camels when not embodied for military service, and therein lies the difficulty. However, by a combination of Civil and Military effort difficulties are not insurmountable, and if Surra is scheduled under an Act and Order there is reason to suppose that it will be successfully collared.

PART III.

Army Veterinary Service as an Instructional Agency.

Chapter I.—GENERAL.

In the late War, when officers and men were rapidly got together to serve their Country, the lack of knowledge of animals displayed was remarkable. It was really not surprising when one considered that the majority of men were drawn from business and trade pursuits in which horses formed no part. Take, for instance, a Division, the Infantry of which consisted of seamen, and the Artillery composed of men drawn for the most part from mines. One can hardly imagine a more unfavourable combination of elements for the care and management of animals, and one can picture the disadvantage under which such a Formation laboured at the outset, and the results which followed in the train of inexperience and want of knowledge. Yet long before the end of the time there were no proverbial flies on that Division in the general management of its animals.

It is only one example of many, and it goes to show that in matters of animal management, instruction is just as necessary as in other military duties if a high or satisfactory standard of efficiency is to be maintained, and dead loss avoided. In the section which I have written entitled "Wastage of Animals in War" there is abundant evidence of wastage that could have been avoided with more perfect knowledge of animals, their temperament, their capacity for work and the general factors which go towards the preservation of their health.

The avoidance of wastage is one of the business propositions of the Army, and a knowledge of business has under all circumstances to be acquired.

In the Regular Divisions and Cavalry of our pre-war Army, the knowledge and art of Animal Management was of a high order. It had been duly taught as a part of a routine system in units and at schools. The fine touch was never lost during the war, and the leaven that leaventh the lump remained to continue the process.

Looking at the question, however, from the individual point of view, it is necessary that arrangements should exist both in peace and war whereby both Officers, and Non-commissioned Officers can conveniently have the principles of Animal Management, and the physiological laws which govern health and avoid sickness, taught and explained to them both by precept and by example.

It is all a matter of hygiene, and rightly it should come under that heading, for there is the Hygiene of the body in its various aspects of form and function as well as the Hygiene of the stable.

Precept is founded on a knowledge of Veterinary Anatomy and Physiology, therefore it is that Veterinary Service is charged with the duty of instruction with regard to the preservation of health of animals, and advice respecting the prevention of disease and inefficiency in its various forms. This does not affect the responsibility of Unit Commanders towards their animals: but it is the combination of responsibility and the assistance derived from expert sources that makes for health and efficiency.

I am of opinion that Animal Management or Animal Hygiene (I dislike that the term Horse-mastership should come within the purview of Military Training of the General Staff Branch of the Army) and the curricula of Instructional Schools and Classes should be included in their training arrangements. The inclusion adds very little to General Staff duties, and the interest would be an incentive towards efficiency. Administrative arrangements would not of course be interfered with.

During the war in France, with the constant influx of new officers and men as reinforcements in replacement of casualties, it was soon found that the new material required tuition in respect to the care and management of horses. In addition to instruction which was imparted by classes within their Formations as best possible—a difficult and not altogether a convenient or satisfactory proceeding—classes of instruction were held at the large Veterinary Hospitals on Lines of Communication, where examples of wastage existed in abundance, and lessons of mismanagement could be fitly illustrated. The Classes were only of ten days' duration each, and the *A.B.C.* of Animal Management only was attempted, as it was deemed expedient to train as many Officers and Non-commissioned Officers as possible in the shortest possible time. Up to May 1918, 850 young Officers and 4500 Non-commissioned Officers were trained. The Classes were limited to young Officers and Non-commissioned Officers, the older and more experienced being debarred, General Headquarters arranged for the extension of the Officers' and Non-Commissioned Officers Messes to meet the situation, and the break from the conditions at the Front was as much appreciated as the utility of the Classes.

The majority of the pupils clamoured for an extended course, as they said they could not grasp everything in ten days, and that just when they got interested in the subject they were required to return to their units. A proposal was then put forward for a three weeks course and fixed " Schools of Animal Management " with whole-time Instructional Staffs, but the man-power situation would not admit of it, and the original system had to continue until the termination of the campaign. However, it is very interesting to relate that after the Armistice the classes were re-constructed into Classes of Agriculture and Animal Husbandry, under the direction of the General Staff, as part of their big Education Scheme, and they became very popular for officers and men who desired to take up farming. The desire on the part of men for instruction was so keen on the conclusion of hostilities that in another direction—in Meat Inspection—Veterinary Service was asked if it could arrange classes, and for one class there were about five hundred

applications. I mention these incidents to show the value which officers and men themselves attached to instruction, the after-Armistice classes being entirely voluntary.

Let us see now how it can be applied as a practical proposition in the Army, and for easy discussion I shall arrange remarks under three headings, such remarks being held to relate specially to India:—

INSTRUCTION DURING PEACE.
INSTRUCTION DURING WAR.
INSTRUCTION IN VIEW OF MEN TAKING THEIR DISCHARGE FROM THE ARMY.

CHAPTER II.

INSTRUCTION DURING PEACE.

In India there are two properly constituted Army Veterinary Schools, one in the South, at Poona, and the other in the North at Ambala. Each is affiliated to a large Station Veterinary Hospital, and has therefore every facility for teaching and demonstration. The Principals of the Schools are specially selected by reason of their ability to teach, their experience of India, and their knowledge of Hindustani. Classes used to be of six weeks and two months duration, but to permit of more pupils being instructed, the period has been reduced to three weeks. The schedule of instruction is entirely directed towards Animal Management and the prevention of inefficiency, with a little instruction in methods of first aid. Dissertations on particular diseases and treatment of a more advanced degree, which in days gone by used to form a considerable portion of the curriculum, have been curtailed. War has shown that ineffectives are best handed over to a Special Service for treatment, and that the *rôle* of units is one of minimising inefficiency by knowledge and expedient rather than treatment of ineffectives, for which they have no time on active service, even if the procedure was correct.

Thus the aim and object of these classes is prevention of disease, wastage, and inefficiency; and to effect this more surely

and perfectly, the young Officers and Non-Commissioned Officers—the more responsible personnel of units as it were, are selected for instruction, so that on return to their units they may intelligently apply the principles which they have learned, and in turn instruct those under them. There are separate classes for British Officers, Indian Officers, British Warrant Officers and Non-Commissioned Officers, and Indian Warrant Officers and Non-Commissioned Officers, and no branch of the Service is missed out.

Another item of advantage in these classes would be for the teacher to take his class on occasion to the several units in the station, and with the permission and assistance of Unit Commanders to see how horses are teamed up, how harness and saddlery is fitted and kept, and how loads are adjusted. The more varied the experience, the better is initiative suggested. It was wonderful during the late war what useful expedients for the comfort and well-being of animals were adopted by personnel of units, all the outcome of experience, teaching, and intelligent interest taken.

A very important *rôle* therefore is played by our Army Veterinary Schools, and the training on essential lines should be carefully watched, anything unnecessary or redundant being excluded.

Army Veterinary Schools are also for the training of Army Veterinary Corps personnel specially in attendance on sick, dressing wounds, etc.

In our Equitation Schools a syllabus of Animal Management can always be included in the general curriculum, and if there is not a Veterinary Instructor, an Officer of the Veterinary Service can always be detailed from the station to carry out the duty. The establishment of the Cavalry School at Sangor includes a Veterinary Instructor, who is specially selected. In addition to matters of Animal Management, animal conformation and mechanism in relation to training of horses is a considerable item of importance now in all Cavalry Schools. I need not add that it entails a knowledge of anatomy.

Furthermore, it is always up to the Administrative Veterinary Officers of Divisions to arrange lectures and demonstrations within the Division as may be desired or as circumstances

present themselves. For instance, on the occasion of inspection of units very often a few useful hints or lessons may be imparted, particularly perhaps with regard to dieting in relation to season or work, care of feet and shoeing, and any other matter which the inspection suggests. In point of fact, the value of a Veterinary inspection of a unit is not altogether one of report on efficiency or otherwise to a superior officer, but it is the watching of any item that can be improved or remedied, conducing thereby to the health and efficiency of the animals concerned. I call to mind the many pleasant days and hours spent with Commanding Officers in the old times of my inspecting career in India, when we used to have a regular sort of *indaba* on animals; getting rid of the effete, and discussing ways and means of bettering a situation; arrangements probably having been made specially some time before. The principle of assistance and advisory counsel can always be made to fall in with the formality of inspection, and in its varied aspects it fits the Administrative Officer of Veterinary Service almost more perfectly than any other Administrative Service or Department. It is, at all events, an item of instructional agency on which great store can be laid.

Chapter III.

INSTRUCTION DURING WAR.

The difficulty of this is very readily apparent. First, mobilisation upsets all teaching in schools, as all ranks are required to take their places in their units, and a good many of our units in India, particularly perhaps in transport units, are not too well endowed with the necessary responsible personnel for supervision and care of animals in the manifold duties in the Field. Schools, too, for the same reason are apt to close down.

However, so far as Army Veterinary Schools are concerned, as these institutions are contiguous to Army Veterinary Corps Depots, which will certainly be required to function in war as well as in peace, it would be quite simple from a working point of view to continue the Schools—in fact they will be required

to function during war for the training of A.V.C. personnel of the Depots. So that it would be quite feasible at the same time to undertake instruction in Animal Management for Officers and other Rank reinforcements of units as may be desired, even if courses of only ten days were all that could be afforded. It would be a more suitable and convenient proceeding than collecting Officers and other Ranks in the Field at selected centres. During the late Expeditions on the Frontier the latter was adopted by General Officers Commanding Divisions, Cavalry Brigades and Divisional Areas whenever possible and when other duties did not interfere; but when establishments are short it is not altogether a practical proposition. However, a few ten days' classes in the Field were arranged, Mobile Veterinary Sections, Field Veterinary Hospitals, and Transport units were used as demonstration units, the A.D.V.S. and A.D.S. and T. of Formations gave lectures and demonstrations on a simple syllabus published in Army Routine Orders.

In any case, one has to be guided by opportunity and necessity while on Field Service. The situation can always be watched, and action taken accordingly. Ways and means may suitably present themselves, and so far as the Front is concerned we may leave it at that.

Chapter IV.

INSTRUCTION IN VIEW OF MEN TAKING THEIR DISCHARGE.

The Army has accepted the view that its responsibility to the soldier is not altogether confined to his training and use as a fighting man. The Great War has shown that it has another and greater responsibility—that the best years of the soldier's life should not be idly wasted, as it were, but that in view of his return to civil life he should be prepared for some trade or calling which will render him economically efficient and a good citizen of his country. A policy of General Educational Training has therefore been introduced into the Army, and without

question, it is not only a step in the right direction, but it has come to stay, and it will bear good healthy fruit.

I know of no better direction in which this policy can be considered in India, nor where greater necessity for instruction and enlightenment exists, than in Agriculture and Animal Husbandry. I have grouped the two together, as obviously they are co-related, and I have used the term Animal Husbandry advisedly, as it covers everything that appertains to the breeding, raising and care of stock.

The majority of our Indian soldiers are drawn from the Zemindar class. If, therefore, we can by some simple process give them the benefit of our experience and of progressive ideas with regard to agriculture and the management of stock, we are not only enriching the individual, but helping the country to an incalculable degree. I should like to speak with no uncertain tone in this matter, and as one who is brought face to face with the necessity that something should be done to improve the lot, and reduce the suffering and loss of animals in India. In the section "Wastage of Animals in War" I showed, as briefly as I could, the serious amount of loss resulting in the Army from dire contagious animal diseases. This is nothing to what occurs in Civil Communities in India, upon which the Army is dependent for its Transport and Food supply.

In the Civil Veterinary Statistical Returns for year 1917-18, 3175 Equines, 249,010 Bovines and 22,375 other animals are shown as having died from Contagious Disease alone. In the year 1918-19, 933 Equines, 228,414 Bovines and 12,858 others are similarly shown, and Reports at the same time make it quite certain that owing to the weakness of the cadre of the Civil Veterinary Department, and the inadequacy of the machinery necessary for complete control, full mortality is not recorded.

Anyone who visits the Imperial City of Delhi and sees the miserable tonga and gharry ponies, requiring the *lakri* and *chabuk* to accelerate their movements, cannot but be struck at the backwardness of the country in respect to its animals. India has made very rapid strides in Agriculture during the past ten years, but the Animal Husbandry side of Agriculture

has not kept pace with the growth of crops. Newspapers teem with reports and literature regarding wheat and cotton, but not a single word ever appears about stock. In my opinion it is really a very sad situation, and the danger of it is that there may come a day when the country wakes up to the fact that through heavy mortality, and perhaps indifference to true interest, there is a grave shortage of animals necessary for the life of the country.

The Army through its Educational policy can be made a very powerful factor for good in the situation described. By a combination of Civil Veterinary and Agricultural Departments and the Veterinary Service of the Army, it ought not to be difficult to draw out some plan of campaign whereby men, before taking their discharge and returning to civil life in rural districts, could receive a little up-to-date instruction in animal husbandry, dairying, farm economies, etc. The awakening of an intelligent interest is most desirable in the first instance. Progress will follow in its train. The General Staff of the Army in India has already the matter in hand, as will be seen from extracts of a Circular letter to all Commands, dated 31st March 1920, which I now quote :—

"The Army for the purpose of Education cannot be regarded as a watertight compartment, and the Government of India has invited the co-operation of Local Governments and Administrations with local military authorities in furthering the development of educational training; Officers Commanding should therefore have no hesitation in seeking the advice and assistance of members of Civil and Educational Services; such advice and assistance will be of the greatest value, and of a nature unobtainable from any other source."

"The proposals under consideration contemplate therefore the provision of facilities, either within or without units, for instruction in rural economy, *i.e.*, general agriculture, horticulture, dairying, animal husbandry, Veterinary Science, farm economics — including forms of co-operation as applied to agriculture—agricultural engineering, elementary mensuration and land surveying, land tenures, etc., and where desired, for instruction in cottage and village industries."

It is to be hoped in the interest of stock that such measures can be introduced soon. The Army with its Veterinary Service on a self-contained basis, complete with its own trained personnel, and with its Veterinary Hospitals properly organised and conducted, will have every facility for carrying out its desired programme in conjunction with the Civil Authorities.

Chapter V.

INSTRUCTION IN SHOEING AND SCHOOLS OF FARRIERY.

Almost from time immemorial, the advisory council in respect to shoeing of animals of the Army, the supervision of training of Farriers and Shoeing-smiths, and questions regarding the fixing of the various patterns of shoes, have been vested in and referred to the Veterinary Service of the Army. Regimental Veterinary subordinate assistance has from distant ages been carried out by the Farriery Establishment. The great majority of lameness is referable to the foot, and often the remedy is special shoeing. The interests of the Farriery Establishments of units and all that appertains to their duties have been carefully watched and assisted by Army Veterinary Service.

Training is essentially regimental, and so far as British units are concerned this system was very pointedly ordered by Army Council Instruction about two years ago, Schools of Farriery which were organised during the war being closed down. A regimental system of training may be quite satisfactory in peace time, but it falls to the ground in war, and recourse must then be taken to teaching in Schools or Depots. A different system in peace and war is not judicious, and a change at a critical time is hardly good business. Personally I am of opinion that all training of shoeing-smiths should be conducted in properly organised Schools of Farriery. It would suit Indian requirements much better than a watertight regimental system, which is difficult in the case of small units and in those of Administrative Services and Departments. Moreover, by

means of Schools requirements for war, including expansions for war, would be more satisfactorily met. Great difficulty was experienced during the late Frontier Expeditions in obtaining shoeing-smiths, not only for new units raised but for replacement of casualties. Divisional Schools of Farriery have been organised to meet more particularly the needs of small units other than British mounted units, in which the regimental system continues. They are however only tentative arrangements, and are pending the consideration, at some future date, of the formation of more complete self-contained Command Schools of Farriery. I am also inclined to think that advantage and economy might accrue from the creation of a Corps of Farriers, or a Farriers' Branch of a general Corps of Artificers, the personnel to be attached to units as required, and with arrangements to meet expansion for war by means of reserves. There are lots of good practical men who are not only capable of instructing, but knowing the requirements of the Army perfectly, are capable of administration. A body of men like our well-proved Army Farriers usually with long service to their credit, is well worthy of consideration and advancement, and I can vouch for the output of their labours being of an efficient and economic order.

PART IV.

The Merits and Demerits of the various Breeds of Animals used in War.

Chapter I—GENERAL.

Wastage of animals in war, and experience gained with animals during the conduct of campaigns, very naturally and appropriately leads to questions of the comparative value of the different breeds and classes for military service. Military efficiency is aided by enquiry and report, and production on the right lines for military requirements is stimulated.

So unusual were the transactions and expenditure in animals during the late war, and so profound were the lessons in endurance, utility, and suitability for particular purposes to be derived, that the Army Council, on the conclusion of hostilities, called for a special Report from the British Expeditionary Force, France, for the information of the Ministry of Agriculture, as to the merits or otherwise of the various classes of horses that had been employed by that Force, and particularly with regard to the heavy breeds of horses. The Field Marshall Commanding-in-Chief, whose knowledge of animals leaves little to be desired, and whose constant solicitude for their care and well-being during the war was so marked, expressly commanded that a report should be furnished, and the present article, in so far as it relates to common interest, embodies a certain amount of the information then supplied.

Added to this, it is proposed to discuss the merits and demerits of animals employed by the Army in India in its Frontier warfare.

In a previous section, I endeavoured to show that wastage of animals in war—at least the preventable item of it, was governed or influenced by certain factors which may be summarised as follows :—

Remounting, and ability to place animals in spheres of service best adapted to them.

A knowledge of animal management with particular reference to food and feeding, water and watering, and bodily hygiene.

Acclimatisation.

Nature of work to be performed, and fitness for the same.

Contagious and Specific Disease.

The same factors come into operation when the merits or demerits of animals in war are reviewed. The greatest of all factors is perhaps the mind of man; for the merits and demerits of animals, inherent or otherwise, are ultimately bound up in the ability and thoughtfulness of individuals who are constituted their masters, philosophers, and guides.

Wastage, expressed in actual figures, is not always a true criterion of animal efficiency, but from our experience generally it is possible to formulate a reasonably good idea of the utility or otherwise of the various classes which have been drawn from different countries and localities to participate in war.

Speaking generally, the close of the Great War presents to our minds exactly the same opinion that was expressed during and at the end of the Boer War—that the small animal, of whatever class or type, is the best adapted for war. The reason is obvious. The bigger and taller the animal, the greater the ration required; the greater and bulkier the ration, the longer the time required to consume it. Difficulties of supply, amounting at times to shortage, and curtailment of the time necessary for consumption, are inevitable circumstances of war, and especially during particular offensive periods. Debility (poor condition) becomes the chief item of Wastage, and this condition may be spelt with four letters, viz., F O O D. The tall, big, leggy animals of any class, as a rule, form the majority of Debility cases. It was a noteworthy feature in France that the small pack animal or cob used for various purposes was

conspicuous by his absence from Veterinary Hospitals. The wastage in Light Draught Mules as compared to Light Draught Horses on an equal ration was infinitely less, in fact the small amount of Debility (poor condition) in mules was remarkable.

Size therefore plays a very important *rôle* in the general utility and success of the Army animal where so much depends on ration, and for the various arms of military service the following *maximum* heights are recommended :—

		Hands.
1.	Officers' chargers :—	
	General Officers	16·0
	Cavalry chargers, R.H.A. chargers, R.F.A. chargers	15·3
	Infantry chargers, Other Services chargers	14·2 to 15·1 according to class of pony, cob, or small well-bred horse.
2.	Cavalry Troop Horses	15·2
3.	Other Riders	15·1
4.	Pack Horses	15·0
5.	R.H.A. (Light Draught) Horses :—	
	Lead	16·0
	Centre	15·3
	Wheelers	15·2
6.	R.F.A (Light Draught) Horses :—	
	Lead	15·3
	Centre	15·3
	Wheelers	15·2
7.	Heavy Draught Horses	16·1
8.	Light Draught Mules	15·2
9.	Pack Mules	14·3
	Ordnance Mules, India (Mountain Battery) are from 13·2 to 14·1, and stout.	

In estimating the heights quoted above, it is intended that they should be viewed as a guide only. Considerations of proportionate make and shape, and robustness of constitution, are primarily implied, and it goes without saying that these are necessary factors in the suitability of an Army horse of whatever class.

Chapter II.

HEAVY DRAUGHT HORSES.

In remarking on the merits and demerits of the different breeds of Heavy Draught horses employed during the war, it is necessary to bear in mind that these animals have a greater value in civil life (commerce and agriculture) than for military use, and therefore it is wrong to judge them entirely from a military standpoint. They are also so surrounded with pride of country, competition of production, fancy, fashion, preference, prejudice even to controversy, and ill-luck during the war, that comparative consideration is not altogether an easy one. Moreover, in France the latter difficulty was increased by the fact that so many animals were of crossed breeds, or so untrue to type, or so altered in form by the vicissitudes of campaign, that a differentiation of breed was in a large measure impossible. However, their value as a whole was highly appreciated by competent impartial judges in France, for on demobilisation and sale of surplus animals demand was so great that very high prices were realised. I call to mind one sale of fifty-two Heavy Draught Horses where the average price realised was Frs. 3,166, two English Shire Horses brought Frs. 5,150 and Frs. 5,000 respectively, though American Percheron cross-strains — notably Percheron and Clydesdale crosses — ran them pretty close. I may mention also that representatives of Land Reconstruction sent by the French Ministry of Agriculture to interview me and to show me types of mares which they desired to purchase for agriculturists in devastated areas, chose as the best type a big Shire, a tolerably good specimen of that breed.

Shire Horses.

Without question the Shire Horse as bred in England is the finest Heavy Draught Horse in the world. His merit is his size and strength, and if bred to proper type he is perfect in form. He commands a commercial value unequalled by any other Draught animal, and it is this commercial advantage which will ever commend his production to the agriculturist and breeder, and secure for him the premier place in England. It pays the ordinary farmer to breed him, to use him first for farm work, for which he is most suitable, and when nearing maturity to sell him to Railway Companies, Milling and Lumber Companies, etc., for heavy haulage work. With legs and feet specially formed and adapted to get a good purchase on the ground, and with his muscular power and weight so perfectly distributed and balanced, the heavy haulage loads which he is capable of moving are astounding. I do not think he has his equal in this respect.

I remember on one occasion at a well-known railhead in Northern France necessity arose to place some trucks for unloading. A Mobile Veterinary unit near by chanced to have a big Shire whose appearance indicated an association with British railways, and his services were enlisted for movement of the trucks. The old familiar way in which he turned to them, the quiet steady pull, and the stop at the word of command were most entertaining. He was back to his old job, and his *métier* having been discovered, he was in constant request, and performed very useful work at that railhead.

All animals are creatures of environment. The climate and environment of England suits the Shire Horse, and his breed is therefore well established in that country. In other words he is good because he is born in England, just as the Clydesdale is best in his home in Scotland, and the Percheron excellent in France. But in the breeding of any of these classes outside their own particular habitat, say in a foreign country, the result is not altogether satisfactory. Type is lost, nondescripts are apt to be produced, and financially there is no gain. On this account it is extremely doubtful if the Percheron as a pure breed will ever make much headway in England, to which country he has recently been introduced by interested communities. Also

the English farmer is too conservative to change his views; he would prefer to stick to the animals he is accustomed to and knows, than resort to an alien, however good.

The massive size of the Shire is his drawback as a war horse. He is too big. He requires a large ration, and all horses which have to perform heavy haulage must have bulky food in the form of hay and straw, which from force of military circumstances it is not always possible to supply, or to find opportunity to consume. Major-General Sir Frederick Smith, in his book "Veterinary Hygiene," very aptly hits the nail on the head in the following remarks:—

"The length of time it takes a horse to consume its daily diet is a question which seldom strikes anyone to enquire into, yet it is of utmost importance, especially for horses employed in commerce and military life. It takes a horse from five to ten minutes to eat one pound of corn, and fifteen to twenty minutes to eat one pound of hay. We shall not be far from the truth in saying that they require from five to six hours out of every twenty-four for feeding, that is to say, one quarter of the day must be expended in taking in nourishment for the repair of the machine. We see here the wisdom of the carter and cabman who puts on the nosebag at every opportunity."

Alas for the opportunity often on Field Service! And it sums up the chief demerit of the Shire horse, or indeed any heavy draught horse in war.

Another drawback to the Shire, and in like degree to the Clydesdales, but not to the same extent in the crossed Percherons—at least in those purchased overseas and sent to France—is that they ill stand movement by rail or sea from their original abode and surroundings. Their temperature goes up, they refuse their food, they begin to cough, and they are laid open to attacks of respiratory trouble. Very often movement from one stable to another is sufficient to bring this about. We had no luck with our heavy horses until we adopted a thorough system of taking temperatures—first at the place of purchase before movement to a Remount Depot, subsequently at Remount Depots before shipment to France, and again on disembarkation. They, above all other animals,

necessitated residence in Remount Depots in France before being drafted to units in the Field, endeavour being made to hold them up to three weeks. Their temperatures were carefully taken before entrainment—an absolutely necessary proceeding.

In the early days of the War, the mortality amongst our beautiful Shires from respiratory disease was very heavy. Circumstances of rapid collection, change of surroundings, change of diet, and exposure all militated against them, and they became prey to Pneumonia of the Influenzal type. Once over initial sickness, and "acclimatised," they rendered a good account of themselves where suitably placed. It has to be remembered that the serious forms of respiratory sickness in horses are referable to infection, and there is no doubt that the lethargic heavy horse is not only a readier prey to disease of this nature, but more easily succumbs than his lighter *confrères*.

The heavy feathering on the legs of the Shire horse—and in like instance of the Clydesdale—proved a distinct disadvantage for service at the Front in France. Nature, without question, intended this covering as a protection to the heels and lower parts of the legs from wet and from injury, whether from ploughing in the furrow or from treads, but however much an advantage in the stiff clay lands of England, it was quite incompatible with the liquid mud of Northern France, churned up by countless animals and fouled at times to an intense degree by dung and urine. It was not possible to adequately clean such heavily coated legs—with the result that they were prone to "grease," cracked heels, and other affections of the skin of the legs. To remove the hair only produced or intensified a Seborrhoea. Votaries of fashion in their attention to the production of "feather," fine or otherwise, never dreamt of liquid filthy mud, sometimes knee and hock deep.

However, at Base Ports, for Dock duty, and service on Lines of Communication generally, or under circumstances more or less approximating peace conditions, that is to say, for slow work on the top of the ground, with opportunity for getting a sufficiency of bulk in ration and plenty of time to eat it, and

under favourable housing, the heavy Shire did well. With the absence of these conditions, more or less, he is not so suitable in forward areas, and at times of supreme effort when extra care is lacking, he becomes a candidate for evacuation and the Veterinary Hospital.

The smaller Shire on the other hand gave a good account of himself at the Front, most certainly in Royal Army Service Corps units, and even in units of Heavy Artillery, provided he was of the right sturdy type, and seasoned.

I have written more about the Shire than perhaps occasion requires, but having been brought up with him as it were, I may be excused in justly singing his praises. I close with remembrance of a little mare, the grand-daughter of a pure-bred Shire mare (a prize winner at Agricultural Shows) by two thoroughbred crosses (the last being by "The Mate," winner of the Two Thousand Guineas) who was a good little hunter, a great stayer, and who took a gallant part in the Relief of Kimberly, suffering death at the hands of the enemy.

Clydesdale Horse.

From an active service point of view, the same demerits of proneness to Respiratory Disease on movement from an accustomed habitat, heavy feathering of the legs, and liability to "grease" and other diseases of the skin of the legs, exist in the Clydesdale as in the Shire; but he has the merit of being smaller and more active, and it was shown in France that provided he was of a short-legged, stout, sturdy build, his record, even in the Forward Areas, was generally satisfactory. It is of course entirely a matter of suitable placing.

In no breed, however, does type appear to be so variable. Many indifferent animals were sent the British Expeditionary Force, France. A large number were long-legged, flat sided, and light in the middle—absolutely useless animals for the heavy draught purposes of War. It was difficult to recognise many of them as Clydesdales. Indeed it was quite evident that if it is desired to maintain a place of supreme excellence, this very useful breed of horse requires considerable grading up in its breeding.

The Clydesdale strain found much favour with the Australian Corps in France, and the remarks of the Administrative Veterinary Officer of that Corps are worth recording:—

"There is little doubt in my mind and in all I have spoken to in this Corps that the best breed for military work in the heavy class is the low, clean-legged Clydesdale. Most of our horses from Australia were of this type, and they have been very much admired by good judges of horse-flesh. They are smaller, more active, and yet have always been able to do as much work as the heavier Shire type, added to which they have obviously suffered less from the skin troubles of the legs, such as "grease," cellulitis, and necrotic dermatitis. Their smaller size allowed them to do better on the ration, and proved them to be more economical in feeding."

He further added with regard to Clydesdales and breeding:—

"For an Artillery animal, again, the Clydesdale Mare crossed with a thorough-bred stallion, gives as near the ideal as we have been able to breed in Australia, and the gunner type most favoured by the Indian Army. Breeding with cross-bred stock is not found a success, as animals throw back to unknown ancestors and we get reversions to undesirable types. The method I am advising has been proved by many animals used in this War whose breeders and their methods I am familiar with."

The Assistant Director of Veterinary Services of the Canadian Corps, who also had charge of all Remount arrangements of the Corps, while remarking adversely on the Shire during the War —giving the usual objections in respect to "feather," and a brittleness of feet, reported of the Clydesdale as follows:—

"The old-fashioned, short-legged, round-barrelled type has proved very satisfactory. Those that are leggy, and light of barrel have proved to be of little use."

I have quoted Colonial and Dominion views specially, presuming such to be perhaps more unbiassed than purely Home opinion.

Since my return to India on a third tour of Service I have visited nearly every Remount Depot, and I am very much struck with the excellent Medium and Heavy Draught Horses received from Australia, and held under training primarily for Mesopo-

tamia, I am all the more surprised because I never realised that animals of this class were procurable in numbers in Australia, and especially from Queensland, whence I noticed from their brands many of them came. Another surprise after coming fresh from the disposal of animals on demobilization in France, is the price at which these animals have been purchased and landed in India, viz. £45 and £50. If such animals had been offered for sale in France at the close of the War they would have realized anything from £100 to £200. A pair of medium heavy draught horses which I recently saw in the Horse Transport Company in Waziristan certainly would have realized £250 each horse. The majority of them are Clydesdales, and it is quite easy to pick out pure strains. At the sight of them I was instantly reminded of the remarks of the Australian Corps in France quoted above, and one could readily appreciate the Australian preference for the Clydesdale strain in draught horses. With such good material at reasonable cost, the thought naturally occurs to one's mind as to whether they could not be put to more general use in India for transport purposes both in Peace and War, and their production in Australia fostered. The small wheeled transport in common use in India, though suitable generally, absorbs a large number of carts, animals and men, and the employment of larger wagons (*e.g.* General Service), stronger animals, and fewer drivers, carries a suggestion of economy—at all events for certain purposes or under certain circumstances. No doubt the policy of utilising the resources of India for Army purposes is a correct one to follow, but it is necessary to remember that conditions which chiefly govern the growth of young stock are either deficient or absent in that country, and for Artillery and other forms of heavier draught, recourse elsewhere must be adopted. Australia, for instance, is a country, *par excellence*, of good grass and suitable climate, where stout and robust horses are raised, and it is a very happy circumstance that India has a call on the resources of that country to supply deficiences. There is now not a single type or class of horse for Military purpose, from the light Indian Cavalry to the heavy Artillery Draught, which cannot be procured in Australia. Furthermore, questions of supply of suitable animals are rendered easy by reason of the

fact that there are resident in that country regular exporters of animals to India who not only know Army standards perfectly, but who are tutors towards suitable production in their own country. It only remains to remember that Australian horses, coming from a Southern Zone with reverse seasons, require in India a period of acclimatisation, and this is more necessary in the lethargic heavier types than in the light horses for Cavalry.

Suffolk Punch.

The number of this Class of Heavy Draught Horse employed during the War in France was relatively very small, and experience of them was limited. In consequence, opinion was varied amounting to diverseness, some officers reporting extremely well on them, and others condemning them as unsuitable for Army work by reason of their being "top-heavy," and therefore subject to lameness in the feet when called on to perform hard road work. They certainly had two outstanding merits for Service on the Continent—an ability to maintain a round stout condition, amounting to fatness, on a shorter ration than other Heavy Draught types; and their clean legs in muddy circumstances—two assets which commended them highly in the eyes of Commanding Officers in the Field. The evidence which I gathered from Veterinary Hospitals pointed to weakness of the feet as the chief demerit of this breed of heavy horse. The remarks of one Veterinary Hospital Commander who was not only a very knowledgeable Civil Practitioner, but who had had considerable experience both with units in the Field and in Veterinary Hospitals, are worth quoting :—

"The Suffolk Punch suffered from foot trouble owing to more or less standing on feet and joints defective in shape and make. This animal kept condition well, but as at home, is unsuitable for hard road work."

On the other hand an officer whose powers of observation and opinion I rate highly, and who had a considerable pre-war experience in the purchase of draught remounts, reported on the Suffolk Punch as follows :—

" Is a very useful horse but inclined to be a little over-topped. I have had four or five of this breed during the War, and my opinion has entirely changed. I used to think they were soft

and over-topped. I now think very highly of the breed. Those that I know were not soft, nor over-feathered, and worked splendidly—far better than any other horse we had. The huge body, heavy neck and head were made full use of by the animal while in draught. Instead of starting the load entirely by pushing with the hind legs, these animals used their weight by leaning into the collar and throwing the weight forward. Constitutionally they appear to be very strong, and survived the conditions at the Front, but in most cases that I can recall, the Suffolk Punches were great pets in the Units and were very carefully looked after by their drivers."

There is a good deal of truth in the last paragraph of this officer's report. Care is all important for the success of any breed of horse in War, and the docility and the good condition always maintained by the Suffolk are sure to find for him a place of favour. Personally, from my small experience of the Suffolk Punch, provided he is not over 16·1 in height—all above that height being rigidly excluded as unsuitable and undesirable—I consider him a very good and desirable War Horse. He is hardy, active, and even-tempered. If he is small, there will be no foot trouble.

The Third and Fourth Armies in France reported well on them: in fact these Armies classed Suffolk Punches before Shires and Clydesdales for Military purposes.

American Heavy Draught Horses.

Though not so weighty and powerful as our best English Heavy Draughts, the American Percheron or Crossed Percheron on the whole gave great satisfaction and was universally liked during the War in France. He teams well, is active, has a good constitution, is a good doer, and has good sound legs and feet. The absence of hair on the legs was a great asset in comparison to our English Heavies under the muddy circumstances of winter in the Forward Areas. He is best described as a Medium Heavy, and as such he is quite big enough for the Heavy Draught purposes of War. As a draught animal I do not consider him in any way superior to our English Shire or Clydesdale, or to the smaller of these breeds of which he may be considered a parallel; but there is no doubt that in War he

can be more generally placed, and can stand hardships better than our Heavy Breeds. Whether or not his relatively satisfactory service in France was due in part to a return to the country of his ancestors can only be surmised. He certainly stood the climate very well. He shipped to the country on the whole well, and suffered less from serious respiratory sickness on landing than the Heavy Shires and Clydesdales. At the same time it must be remembered, as I have previously remarked, that respiratory sickness is referable to infection, and in all classes of animals incidence of this form of disease was very greatly reduced by the rigid taking of temperatures on landing and previous to drafting to units. Moreover, the heavy mortality experienced amongst Shires and Clydesdales was during the first winter of the War, when they were practically without shelter of any kind and subjected to incessant rain—a very different state of affairs to the ample and good accommodation provided by such times as American shipments of Heavy animals commenced.

An idea of utility may be gathered from the records of one Veterinary Hospital in France, at which out of 120 heavy draught horses cast and sold in two years, 116 were British (the Officer Commanding was unable to differentiate Clydesdale from Shire) and four only were American.

In another Veterinary Hospital, a Committee of Officers, Royal Army Veterinary Corps, drew attention to the fact that a fairly large percentage of Heavy Draught American Horses had Sidebones, but expressed the opinion that this defect could soon be bred out by careful selection of Sires; in like manner to its exclusion in our English breeds following a more particular classification of the defect as an unsoundness.

A very interesting account of the Percheron horse and the extent to which he has found favour in both North and South America as compared to our English breeds, may be obtained from Dechambre's Traité De Zootechnie, Vol. Les Equides, published by Messrs. Asselin and Houzeau, Place de L'Ecole de Médecine, Paris (a book really worth purchasing; giving a description of all breeds of horses, the administration of Haras, and Remounting of the French Army), and a few remarks will not be out of place in these pages. Of course, it is necessary to

add that from an agricultural point of view, the land both in North and South America, does not require the heavy type of farm horse which the stiff clay land of England necessitates as a rule. Nevertheless the Percheron is a grand sire for a cross, and he is probably the most prepotent of all Sires.

The first Percheron sent from France to the United States was in the year 1851. Up to 1872 purchases were exceptional. In that year mares as well as stallions were exported. Between the years 1880 and 1890, 1,000 to 1,200 stallions and from 100 to 120 mares annually were sent. Exportations slackened off until 1900 when they were resumed fairly actively. At the same time the importation of Shires and Clydesdales into America would appear to have decreased. In the year 1903 the American Percheron Stud Book registered 37,000 animals, while the Clydesdales numbered 10,000 and Shires 7,400.

The introduction of Percherons into the Argentine has also been recent. Seven Stallions were imported in 1900, 256 in 1906, and 180 in 1907. 177 animals comprising 75 Stallions and 102 Mares were imported in 1908. In comparison with the latter during the same year (1908) 73 Clydesdales (54 Stallions and 19 Mares), 53 Shires, and 47 Boulonnais were imported. The Stud Book Registers of the Argentine in 1909 as quoted by Mons. Lesage, of the Veterinary Institute, Buenos Aires, gives the following list of Mares:—

Percheron	Mares	1878	Suffolk Punch	Mares	169
Clydesdale		1729	Anglo-Norman		294
Shire		1100	Hunter		45
Hackney		414	Belge		30
Yorkshire		210	Polo pony		10
				Total	5879

The Percherons purchased by the Argentine are not so massive as those exported to the United States, and purchasers of the latter country have a preference for black colour instead of the "gris pommelé" which is the primitive colour of the Percheron.

Another very useful French heavy draught horse, a few of which found their way into our Army by requisition in the early days of the War, is the Boulonnais, and as his home (Pas

de Calais) was in our midst during our operations in Northern France, he became very well known to us and was much appreciated by good judges of horses. His colour is chiefly grey, not the usual colour for an Army horse; (*Note.*—There is no reason why this colour should now be debarred) but he is a good, compact, sturdy, stout-hearted animal, with a great record for draught, and is an ideal farm horse.

The heavy Belge (Brabançonne) with his massive crest, which we used to see a good deal of in England at one time, is too big as a war horse, but he is an economic factor in Belgium, and his breed entered into some of the crossed American horses used by us during the War.

The Ardennes horse is very good, and is a favourite for Artillery purposes and medium heavy draught.

In any community of animals, however, whatever the breed, there is always a variation in size, and the smaller horses of heavy draught strains, if other good points are equal, can and should be selected. For general draught purposes in Formations and units at the Front, the most satisfactory of all animals was the heavy light-draught Welsh cart horse. Strong, active and hardy, he is hard to beat for all-round draught purposes, and if the question of breeding specially for the Army ever arises, this type should be kept in view and followed. The draught animals purchased in Wales previous to the War for the Royal Army Service Corps were patterns of excellence, and they did remarkably well. We could have done with more of them.

Chapter III.

LIGHT DRAUGHT HORSES.

According to Army specifications and requirements, a light draught horse is one which should be capable of drawing a weight of 1200 lb. for approximately twenty miles per day, walk about three miles an hour, and trot at an average of six miles. This is of course a simple guide to show the degree of power expected, and to indicate a necessary activity in this class.

of animal. It is based more or less on the comparatively easy times of peace, and work on level roads. War, however, upsets all fine calculations, and it is the ability to weather the varying vicissitudes of campaign, and to maintain energy under trying conditions and adverse circumstances that form the chief desiderata of a draught horse.

In this connection a study of the carefully thought out Tables of Transport with details of vehicles and weights to be carried, given in our Field Service Pocket Book, is most instructive.

The heaviest wastage and the greatest demand during the late War related to light draught horses, and twenty of this class were purchased to one of all the other classes put together. It is really marvellous how the supply of suitable animals was maintained, because in recent years the production of this type of animal has been influenced by the substitution of mechanical means for trams, 'busses, and for many commercial and trade pursuits. Take for instance the London General Omnibus Company in 1903 with a stud of 18,000 horses, the Road Car Company 5,000, Tillings 7,000, and the thousands upon thousands of tram horses in all parts of the world, each animal probably requiring renewal every four or five years. All are now conspicuous by their absence, and it is a regrettable absence of animals, hard, inured to work, and specially suited thereby for draught purposes of war. It does not pay to breed them, at least in many countries, for they are not altogether an agricultural type of horse. We very soon touched bed-rock in this class of horse in the United Kingdom, and purchase elsewhere was resorted to.

In speaking of British horses it is necessary to point out that horses are more commonly classed by categories of Service than by Races. For instance we speak of Saddle horses and draught horses, and furthermore they are grouped into race horses, hunters, hacks, carriage horses, van horses, 'bus horses, coach horses, farm horses, and so on. It is only in respect to Heavy breed, Thoroughbreds, Hackneys, Cleveland Bays, Yorkshire Coach horses, or whenever Stud books are maintained, that allusion is made to particular breeds or races. We differ con, siderably in this respect from other countries, as for instance-

the Bretons, Norfolk-Bretons, Anglo-Normands, Petit Percherons, Ardennais, and Anglo-Arabians of France.

The horses comprising the light draught of the United Kingdom are of so mixed a product in breeding that it is best to classify them under the generic term of light draught. Obviously, where crossing ranges from through-bred to heavy draught the result is varied, and in selection for different purposes "type" more than breed or race is followed. In our Army at Home we have type L.D. 1. for Artillery, with the sub-classifications of leaders, centres and wheelers, the latter being sturdier and stouter than the two former; and L.D. 2. for Transport.

Unquestionably, the pre-war "Gunner" type of draught horse, whether bred in England or Ireland, proved the best light draught horse which took part in the War. The sturdy, blocky horses with stout round quarters, which our Remount Service at Home were accustomed to buy before the War, have always been famous, and are quite typical of our Artillery. They have no demerits, and cannot be beaten in any country or army in the world.

They are, however, run very close by the Australian horses of our Horse and Field Artillery in India, in fact there are many impartial judges in our Royal Artillery who would give the palm to the Australian horse, particularly in the Horse Artillery class, which is proverbially excellent in quality and substance. I can call to mind a good many Horse Artillery Leaders of Australian origin who would have given a good account of themselves over a steeplechase course, and who would have proved gold mines if they had not joined the Army.

I have already alluded to the serviceable character of Australian horses with the Australian Corps in France. Others served in the Egyptian and Mesopotamian Expeditionary Forces, and their good record is undoubted. Australia is particularly good in this class of horse, and I am certain that a very strong reason for this is the annual steady demand which India can give for its Army. A satisfactory feature also of Australian horses is that they are essentially of English extraction, Clydesdales and Thorough-bred strains chiefly enter into their composition. The only drawback, as I have

previously explained, is that for service in a Northern zone with reverse seasons to their own, they require a certain amount of acclimatisation. Shipments direct from Australia to France were tried in the early days of the War, but as will be readily realised the long sea journey in addition to service in a country of reverse season militated against the success of an immediate issue. Under such circumstances the best course is to hold them in India for acclimatisation. I need not say that this is fully known and appreciated.

India is not in a position to breed horses of a light draught type suitable for Artillery purposes, Its climate is hot and enervating, and it lacks the green grass of pastures essential for the growth of young stock. An attempt was made some years ago, by the introduction of Norfolk Trotters to increase the size and substance of animals which, with Arab crossing, might produce remounts suitable for Artillery purposes ; but the result was a failure. Much controversy on the subject ensued, but the crux of the matter lay in the unsuitability of the country to raise anything but light Cavalry horses, and those of pony class. Yet in a good grass country like Australia, Norfolk Trotter crosses with Thoroughbreds have produced very good Artillery horses of the Horse Artillery class, and chargers. The progenitor of the Turanville Stud, New South Wales (brand C.R., Mr. Thomas Cook) was a splendid Norfolk Trotter, by name "Flying Shales." His successor was "Warwick Shales" out of a Thoroughbred mare by "Warwick." Their stock put to Thoroughbred stallions of good strains have produced numbers of remounts for our Horse Artillery in India. The Anglo-Normands and Postier Bretons of the French Artillery are of mixed Norfolk Trotter blood. The merit and suitability of any particular breed therefore greatly depends on the country of production, and it is equally true of all animals, whether draught or saddle.

The original Canadian Divisions brought over to France some very useful horses of Canadian extraction, and they did well. They were mixed strains of English, Continental and American horses. Canada maintains its Clydesdale and Shire Horse Societies, as in England, but with the growth of the country in recent years, particularly in the West, Canada imported from

her Southern neighbour for agricultural purposes. However, the ground-work of Canadian horses is our best English stock. Many of the London General and other Omnibus Companies, and general utility horses shipped from England to South Africa during the South African War, which were universally well reported on for their endurance, were Canadian horses; and Canada has always shown a desire for custom in the supply of our home Army. The prairies of the West are excellent for the production of good stock for Army purposes, both draught and saddle. Our Remount Purchase system abroad at the beginning of the late War was based on Canada, Reception Depots at approved centres being arranged, Ports for embarkation earmarked, and Purchasing Depots or Centres contiguous to the Canadian Pacific Railway forming part of the general scheme. A rather remarkable and interesting fact, showing how easily horse-breeding is influenced by circumstances was that in the early eighties, when bicycles of the pneumatic type took so strong a hold on people's minds, it was strongly considered that the days of horses, at least those of pleasure and of a riding class, were numbered, and in the practical Western World down went the production. I may at the same time mention that Mr. Dunlop, the inventor and originator of the pneumatic tyre which bears his name, and whose photograph is to be seen so prominently in advertisements, is a Veterinary Surgeon, and one whose delight in discussion on horse politics is not in any way diminished by the importance of his discovery, or by his retirement from the active domain of his profession.

Wastage in the light draught classes of horses during the late War was, however, chiefly met by importations direct from the United States of America, where the greatest field of purchase lay. This was particularly so at least when the United States herself entered into the conflict. No other country in the world is so richly endowed in horses, and in this class of horse especially. Her resources are remarkable, and the aid which she could afford to the Allied Powers in the command of the most useful animals of the world was a prominent factor in the downfall of the enemy.

Into the composition of the eighteen millions horses with which the United States of America is credited, and taking them

as a whole, there enters by crossment, re-crossment and by special selection, nearly every known breed or species of European horse, including the original Spanish stock implanted in the South in the seventeenth century, the English well-bred importations of Kentucky, horses from the Netherlands to New Amsterdam originally, Canadians of French origin in early times, Clydesdales, Shires, Suffolk Punches, English Thorough-breds, Hackneys, Bretons, Belgians, Oldenburghs, and more recently and in considerable numbers the Percherons. Certain breeds have been specialised, notably the "Standard Bred" trotter, the progenitor of which was an English Thoroughbred "Messenger," though the more immediate *pater familias* was a horse named "Rysdyk's Hambletonian" foaled in 1849 and reputed to be the father of 1300 foals. As other countries, the United States maintains its Horse Breeding Associations with their Stud Books, as for instance, The American Clydesdale Association at Chicago, the American Percheron Society, the American Saddle Horse Beeeder Association, and others. I mention the above to show as briefly as I can what the generality of American horses are like, for as replacement of casualties they came very prominently into the War, both the British and French Governments having purchased large numbers.

Provided our British ideas as to type of light draught horses suitable for Artillery and other Army draught purposes are strictly adhered to, that is to say, if animals are compact, with good stout backs and quarters, the American horse will show as good a record in war as any other. He has already proved his merit as a general utility horse in peace time. His shoulder is as a rule very good. And in a matter of backs and quarters in purchasing, perhaps I may be permitted by way of divergence to relate two little circumstances of an instructive nature. An old Artillery friend with whom I was associated for two years in the purchase of Australian Remounts in Calcutta, never once omitted to stand up to the horse's shoulder and look over his back as to breadth and stoutness. It was his strong point in purchase. The horses of one particular shipper invariably had stout round quarters. His animals could be picked out quite easily without referring to his distinctive brand. The shipper

was born and brought up amongst horses in England, and stout quarters were for ever duly impressed on his retina.

However, it was our experience in France that a large number of American-bred horses were leggy and long in the back, and this category is opposed to the severe conditions of war, particularly under circumstances of wet and mud. It is forcibly brought home to us by a visit to a war Veterinary Hospital. Where light draught horses have to be used at times for pack purposes, with oscillating loads, the necessity for compactness, for stout backs and quarters, is even more important. Of course in a great war where demand is so great, it is very often a case of getting what you can, or purchasing as near specifications as supply or resources permit; but even "border-liners" fail in the offing. Moreover, adding to demerit are the factors of more or less sudden transplantation for hard work into a foreign country, and the partially trained and soft condition of animals rapidly got together to meet wastage. It is really piling wastage on wastage, but difficult or well nigh impossible to avoid in a great war such as we have lately experienced.

Argentine horses, so far as British Expeditionary Forces were concerned, came little into prominence as draught horses during the War. Purchases, however, were made by the French and Belgian Governments. For the most part they are of the riding type, and I shall remark on them more fully under that heading. Speaking generally of Argentine horses, they may be divided into two classes—the Crillio or native-bred, height from 13 hands to 14·3 and by far the most numerous (approximately 4,000,000 out of a total horse population of 4,500,000), and the Mestizo or cross-bred. The Mestizo is the result of the foreign stallion on Crillio mares, and the main reason for the introduction of foreign blood was the desire for horses suitable for carriage work. When I visited the country in 1908 the *haut monde* of Buenos Aires rejoiced in their turn-outs, and a first class horse was worth as much there as in Europe. Imported stock included English thorough-breds, hunters, hackneys, Anglo-Normans, Arabs, Morgans from the United States, Trakehnens, Oldenburgs, Hanoverians, Orloffs, Percherons, Clydesdales, Shires, Cleveland Bays and Suffolk Punches. The

foregoing will give an idea of the composition of Argentine horses, and it will further show that from a suitable Artillery draught point of view the field of supply is somewhat limited. I remember the difficulty experienced by the British Remount Commission purchasing for South Africa in 1908 in obtaining suitable horses for Artillery. One hundred and twenty were at last selected, and they were fairly good specimens, showing Clydesdale, Cleveland Bay, and Percheron strains.

A great drawback to the Argentine horse as a war animal, and particularly for the more or less immediate purposes of war, is that he is "grass fed." As a rule he knows little about grain, his chief diet being the beautiful alfalfa which grows so profusely in the Argentine, either under cultivation as a hay crop, or forming a considerable part of the herbage of pastures. He misses the latter greatly when taken to other countries, and his introduction to manger foods, and particularly the use of a nose-bag, is often a gradual process of coaxing. One can quite understand softness and a falling away in condition under such circumstances—which really sums up our experience of the Argentine horse generally in war.

Though the present section is intended to deal only with animals employed by our own Armies, I may be excused brief mention of some of the races and types of light draught horses of our Allies in France. The Petit Percheron, or Postier Percheron, the French Tramway horse of former days, is a hardy, sturdy animal, and I should like to see a few selected teams of this strain in the hands of our Artillery Horse-masters. I am confident they would give great satisfaction for strength and endurance.

The Postier Breton, with his touch of Norfolk blood, is a great favourite in French Artillery.

The Ardennes horse also has a great reputation as an Artillery horse, not only in France, but in Belgium, Germany, and even in Russia. He is a hard, stout, short little animal, perhaps to our English idea somewhat "jumped-up," to use a horsey phrase, and in some districts one appears to see in him a trace of Arab blood, which I understand was introduced in 1810 by Napoleon.

Chapter IV.—HACKNEYS.

The British Expeditionary Force was specially asked to include in its report an account of the merits or otherwise of animals showing Hackney blood. In no race of English breed is prejudice so strongly shown, and such prejudice is chiefly in relation to his utility as a riding horse. He is essentially a light roadster, a horse of fashion and pleasure for light carriage work, where his high stepping action and prowess at the trot, which form his chief characteristic, can be displayed to the best advantage. As pure blood, war is not his *métier*, unless it bears relation to an officers' mess cart or other light draught duty, or the credit of the country is required to be upheld at a Horse Show. It was generally reported from the Front in France that animals of Hackney blood had no special merit as military animals, the chief fault being lack of stamina. Comparatively few pure-bred hackneys or animals showing much hackney blood passed through Veterinary Hospitals in the British Expeditionary Force, France, which was an indication that relatively few animals of this class (*i.e.* pure or predominance of hackney blood) participated in the War. It was further stated that though there were individual instances of horses of predominant hackney blood which proved useful riding horses for ordinary work, they would fail in fast work.

All the same, as I have several times remarked, Hackney or Norfolk Trotter blood enters to a considerable extent into the composition of the light draught horses of various countries, with marked success; and I think therefore his chief merit lies in his suitability for cross-mating in the production of horses adaptable for light draught purposes, whether for general utility or for the Army. A good many of our small cart-horses have a dash of hackney blood, and the activity, stoutness, and hardiness of these have been greatly commended.

Chapter V.

RIDING HORSES.

"Nevertheless it is generally agreed that the horse, not the cavalryman, did dominate war during many centuries, for it was the use made of the horse, with a rider, that often lent decisive power. It may surely be claimed, therefore, that it was the horse, not the 'moral threat' that proved the most powerful weapon of Cavalry, even as recently as the campaign of 1918 in Palestine."

I am exceedingly glad to read the above from the able pen of Major-General W. D. Bird, C.B., C.M.G. D.S.O., in his article "Years versus Ideas" published in the Cavalry Journal of July, 1920, *à propos* a question of Tanks in replacement of Cavalry.

The days of Cavalry in our Army are no more numbered by the threat of Tanks than they were affected by introduction of bicycles or the use of aeroplanes. One War is no criterion of the next—or another. It is nature, or flesh and blood, that forms the prime factor of War; all else are appliances whereby it can be most successfully waged. Man is the element, the animal is his co-efficient, and armament is his determinator. It is certain that War will never be conducted without animals, both from the essential and the economic aspects of it. It is the same now as it was 2500 years ago, and there is little reason to suppose that the future will disclose any material change excepting in armaments, and until, through the latter, War is made altogether impossible. We will therefore continue to discuss our co-efficient—or our business partner in War.

It is extraordinary how meagre history of war is in respect to the part played by animals. Historians are more concerned with tactical problems and the lessons to be derived therefrom than to the actual pawns that are used in the game. For instance, I have searched through many books to extract information with regard to draught horses in War, but with very poor success. The achievements of Cavalry are more fully recorded, but mention is in general terms only as a rule, and insufficient to point to special merit or otherwise of the animals concerned.

Our Field Service Regulations and systems now, however, include War Diaries and the submission of Departmental and Technical Reports and Returns, and it is possible therefrom to collate a reasonably accurate account of the doings of all animals, of mortality and inefficiency experienced, and to draw conclusions therefrom. One's own personal experience also must necessarily be brought to account.

Nothing has ever equalled our Irish horses for Cavalry work. They are a class by themselves, and we are fortunate in having so favourable a country as Ireland for the production of light horses. It is to be hoped that the industry of light horse breeding in Ireland will be encouraged in every way. It is really an advantage that purchasers from other countries and armies go there for horses. It encourages production, and it shows the esteem in which Irish bred horses are held.

Cavalry, and particularly in respect to the *arme blanche*, unfortunately did not take so prominent a part in France as in previous wars, or as in Palestine; but the merit of our Cavalry horses cannot be gainsaid. They leave nothing to be desired. It was extraordinary how well those advanced in years, and even old, stood the campaign, and the old rule of excluding animals over twelve years of age for war has been exploded. The limit of age is determined by the animal's physical ability, and it is sufficient for the animal to show it. For riding purposes, and particularly for fast Cavalry work, the Thoroughbred Sire is essential—whatever the foundation stock is; and where Debility and Exhaustion are the chief cause of inefficiency and wastage, it goes without saying that the stout, compact, robust animal with good back and loin is the type required. Wastage in Cavalry during the War in France was much less from lameness than from Debility and poor condition associated with the adverse circumstances obtaining.

A propos of the purchase of Irish horses for Cavalry and riding purposes, I should like to refer to the old cry that the foreigners were taking the best mares out of the country, and which from my experience of remount purchasing in that country I, personally, considered very much of a bogey cry. It may not be generally known that 75 per cent. of Cavalry troop horses are mares. Why? Because, apart from the fact that

Equine population comprises more females than males, the small animal of any species is usually the female, and in the case of purchase of troopers for Cavalry or for riding animals where specifications of height and price are relatively low, mares form the bulk purchased. The geldings, which are usually the bigger animals, are sold as hunters and chargers, at a much greater price, and if a catalogue of the Royal Dublin Horse Show is scrutinized it will be found that the majority of the exhibits in the hunter classes are geldings, the *crême de la crême* of production. It is also interesting to relate that the majority of hansom-cab animals in London and other towns in days gone by were mares, the reason being that they were smaller and cheaper than geldings, they were quicker and safer on their legs in rounding corners, and moreover they could be trained to hansom-cab work six weeks earlier than geldings.

A very simple classification of riding horses adopted by our Remount Service at Home is R 1 for Cavalry and R 2 for other riding purposes. Conditions of service or work being so dissimilar in these two classifications, obviously the animal which may be suitable in the latter would not always meet the necessary desiderata of the former. Ability to carry weight and to maintain power and energy under such weight over a more or less prolonged period is the essential factor of a Cavalry Trooper. The weight which an ordinary Cavalry Troop horse must carry is at least 18 stones, comprising the rider (say average weight 10 st. 10 lb.) saddlery, arms, accoutrements, ammunition, clothing, necessaries, rations and water. To meet requirements a certain degree of height is necessary, and above all, stoutness, robustness and fitness are indispensable, especially when the country to be traversed is heavy with mud and mire. There are very few of our best hunters that have the merit of carrying 15 stones. The average height of our British Cavalry Troop horses is about 15·1. Personally, I think that height, except in special instances, should not exceed 15·2—for the reason that adequacy of ration plays so great a part in War.

The history of Cavalry in War from very early times, when it formed the chief arm, and certainly the most popular one, the many changes of its function and employment as necessitated

by armament, and the great influence which Cavalry and Mounted Men-at-Arms has had on the breeding of horses in the United Kingdom and the Continent of Europe generally, is most interesting; and were it not too long a subject, and perhaps beyond the scope of the present work, it would have been instructive to recount the achievements or failures of animals which, as Major-General Bird says, lent such decisive power in battle.

In speaking of the merits or otherwise of the Cavalry horse one must not forget the man. Courage and endurance in the one must find like attributes in the other, and if success is to be achieved the man must be a good horseman and a good rider, in other words, they must be one machine or implement of war suitably combined for offensive, which is the real function of Cavalry. The success of Cavalry of ancient days—of Alexander the Great, of Hannibal, of Cromwell, of Gustavus Adolphus, of Frederick the Great, Marlborough, Napoleon, and right down to the present day has been in a large measure due to this factor of combination, and so it will be as long as Cavalry exists. Hence it is that our Army authorities attach so much importance to our Equitation Schools and the regimental training of man and horse together.

Note as against this the most unsuitable combination of man and horse in the Feudal times, where both were so heavily encased in armour that they could not move out of a walk; where the knight, though trained from his youth up in the use of arms and most proficient in them, was yet often so indifferent a horseman and so heavy with armour that he had to be tied to his mount. "Monstrelet writing in 1416 remarks on the astonishment which certain Italians created amongst French men-at-arms because they could actually turn their horses at a gallop." (History of the Army, by Honourable J. Fortescue). And by the same token King Edward III, The Black Prince, and King Henry V, consistently won their battles at Crecy, Poictiers, Agincourt, by splitting this unwieldy combination, ordaining that their men-at-arms should fight on foot as opposed to the French men-at arms who sat on their horses—to suffer discomforture by the terror and unmanageable ness of their mounts caused by showers of arrows from the

English archers. Certainly in those early days the mounts were not very well adapted to carry such heavy weights and to achieve success as Cavalry. Spanish horses were the favourites for speed, endurance, and courage; and Edward III got all his remounts from Spain. Each knight had three horses, his first charger being a stallion, the other two being either geldings or mares, the smallest being a palfrey which he rode until the danger point, when he was equipped by his squire and mounted his first charger.

The story of battles in which Knights and men-at-arms took part is not complete without an allusion to the blind yet exceedingly brave King John of Bohemia at the battle of Crecy He asked to be led forward into the fray, and his knights, not wishing to lose him, fastened the reins of the horses together, putting him at their head. They fought so valiantly and advanced so far that they were all killed, and were found next morning on the ground with their horses still tied together. A glorious ending to man and beast.

The extreme dearth of good horses was one of the complications of the collapse of the old Feudal Service (Henry VII time) and it was left to King Henry VIII, by enactments very carefully and rigidly enforced, to lay the foundation of our horse-breeding in England.

Category R 2 horses, as previously mentioned, includes riding animals not required to do the fast work of Cavalry. They are less in height, may include cobs and ponies, and are allotted to riding purposes of Field Companies, Infantry chargers, and Ancillary Services. Their work being lighter, as a rule there are no complaints in respect to them, and provided they are suitable for the riders concerned, and that intelligent sympathetic care is bestowed on them, they show a very good record of service. Speaking generally, R 2 had little experience of Veterinary Hospitals in France. They were somewhat like the men of Mobile Veterinary Sections, inasmuch as they had no use for back areas. Cobs were positively conspicuous by their absence in Veterinary Hospitals.

I have briefly alluded to Hackneys as riders. They were not appreciated as such for fast work, but for ordinary, quiet

riding purposes they, and their fellows with predominant hackney blood, were quite satisfactory.

The thorough-bred, or racehorse, if I may so term him, is not, as a rule, a military horse, but price permitting, there are places even for him on necessity, such as light charger duty.

Australian Riding Horses.

For a number of years India has depended considerably on Australia and New Zealand not only for British and Indian Cavalry but for its animals of pleasure, chargers, hacks, polo ponies, etc. They have very few demerits as military animals when carefuily selected as to standard specification. There is plenty of trash in Australia, as in other countries—for which probably so much five-furlong sprint racing is to a great extent responsible—but when India has the call on importers who know Army requirements perfectly, there ought to be few "misfits" where Indian Remounting is concerned. The groundwork, as I have previously remarked, is English stock, and the country is remarkably adapted to the raising of animals of good substance and strength. At one time nearly all British Cavalry Regiments in India were mounted on Australian horses (the term "Waler" was a common expression) and they were classed as medium Cavalry. Now-a-days British Cavalry is mounted largely on country-breds by English thorough-bred, Australian, and Arab sires on country stock. The majority of Indian Cavalry Regiments under the Silladar System, and particularly if they are garrisoned within reasonable distance from Calcutta, Madras, or Bombay, where Australian horses are landed and rail charges thereby moderate, have for many years purchased small, somewhat inferior, and cheap Australian horses in preference to country-breds. These animals rejoice in the name of "Bounders" which perhaps sufficiently explains their quality, and the cost price up to recent years was Rs. 350 as against the better class horse for British Cavalry at approximately Rs. 800, and as against the Silladar Indian country-bred at Rs. 250. These so-called "Bounders," many of which are excellent small animals, are much appreciated by Silladar Cavalry units, not only for their ability to bring a little grist to the mill of the Chunda Fund by an occasional sale of a

made pair to the Commissioner or other notability, but for their generally satisfactory service as light troop-horses and their superiority over the country-bred of Rs. 250 value. Their war record on the frontiers of India, with the Indian Cavalry Corps in France and in Palestine, clearly proves their merit and usefulness for Indian Cavalry men, who are not as heavy as the British soldier, though the sowar went up in weight considerably in France. Their value as trained troop-horses was also appreciated by the Indian Cavalry Corps in France, who specially asked that arrangements might be made whereby units could get their own horses back after treatment in Veterinary Hospitals, which could easily be effected by Remount Service, as the animals were branded with the regimental designation.

Australian horses are all branded, and it is comparatively easy to tell the part of the Commonwealth from which they come. The largest number of military horses that I see in India at present hail from Queensland. Importers also have their own brands, placed under the saddle, and the merits or otherwise of the importer's purchases can therefore be duly observed.

New Zealand horses are much more like English horses in appearance than Australians, and they are unbranded.

It was unfortunate and regrettable that the Australian horses sent to South Africa during the Boer War of 1899-02 were adversely reported on. The reason was that shipments were not typical of what Australia could produce as their real or most suitable war horse. Most of the animals required during that war were for Mounted Infantry purposes. Small horses of the cobby type were asked for. Such animals did not exist, at least not to any appreciable extent. There were "brumbies," "bounders," and small, weedy thorough-breds—the result of breeding for speed in five-furlong racing, a veritable curse in the horse-breeding of any country. One can quite understand the disappointment in Australian shipments of this class, and the bad report which followed. Moreover, during that War the wastage was so severe that importations were practically sent straight up the line, and never had a chance of showing any merit.

However, the account is now squared. The Australian riding horse at war in the various theatres during the past six years, whether in France, in Egypt, Palestine, Mesopotamia, East Africa, or on the Frontiers of India, has not only travelled farther than any other animal, but he has held his own against all comers. The best of them are superb ; the second raters have acquitted themselves with distinction.

Argentine Riding Horses.

Under the heading of Light draught-horses, I mentioned that the majority of horses in the Argentine were riding horses In the main there are Crillio, or native-bred, height from 13·3 to 14·3, suitable only for Mounted Infantry and Light Cavalry. Others are crossed Crillio mares with European Stallions and are larger, but these are limited in number. The Crillio, small horse or pony, (a gelding—the mares not being used) is a wonderful animal in his own country. He will canter along for 80 miles in a day with comparative ease, carrying a huge saddle or *recado* weighing over 60 lb. weight; and he turns out to be a remarkably good polo pony. Yet no name was bad enough for him in South Africa during the Boer War, in fact his purchase was absolutely stopped. In common with others he shared the fate of being drafted into work immediately after landing. He, above all other animals, requires time to acquire military ways. He is a very home-sick animal, sadly misses his friends of his *tropilla*, grieves and sulks for days, and in the process of breaking-in he often has had the stuffing knocked out of him. He is grass-fed in his own country, and one cannot expect anything but disaster to overtake an animal so fed when invited to eat grain—which he has not been accustomed to, and out of a nosebag the like of which he has never before seen. The iron enters into his soul, his soft spirit is broken, and he gives up the ghost. Such is hardly his fault, but at the same time his appearance, with his blazed face and his white legs, is indicative of a softness of constitution which is not in keeping with the requirements of a war animal.

The Hungarian, also a grass-fed animal, failed in like manner in South Africa. Moreover, Hungarian peasants do not ride, their animals as a rule being yoked together as a pair in a light four-wheeled vehicle.

Arabs.

I have no great liking for Arabs for Cavalry, at least for British Cavalry in India. I am always reminded of the occasion of casting about thirty of them for sprained tendons and ligaments, at an annual veterinary inspection of the 15th Hussars at Muttra, in 1907. They were mostly young animals. The men were too heavy for them in training. It was rather a surprise to me, for Arabs, though really ponies, are virtually miniature horses, stunted by reason of the country of their birth; but their beautiful make and shape are altogether in favour of carrying weight. And it is no uncommon sight to see Arab polo ponies moving like clock-work under heavy owners on the polo field. But as long as the Arab horse up to 14-2 commands the very high price as a racing animal, or even a lesser price as a polo pony, he will not bulk very largely as a military troop horse. His endurance, particularly in arid regions, is phenomenal, and his propotency as a sire remarkable. Old history of war is full of his achievements, and he left more than "foot-prints in the sands" wherever his incursions and excursions took him. I specially use the masculine gender in his description because Arab mares are not permitted to leave the country of their origin, and "himself" for the most part has to be "altered" in a little matter on joining His Majesty's Forces, which makes him more amenable to discipline and altogether a better soldier.

Included in this breed is the Syrian horse or pony, which has performed such marvellous work in Cavalry in Egypt in days gone by. He has a wonderful constitution and is admirably adapted to warfare in Eastern climes. An example of endurance under trying conditions of paucity of rations and lack of water is recorded in the annals of the Nile Expedition of 1884-1885, for the Relief of Khartoum, in which Arab stallions, average height 14 hands, average age 8 to 9 years, purchased by the Egyptian Government in Syria and Lower Egypt for Egyptian Cavalry and delivered over to the 19th Hussars, performed one of the most remarkable feats possible to relate.

The following is a brief history of their achievement. In June 1884 they were taken by barges from Cairo to Assouan,

where they remained for three months. In September they were marched 210 miles to Wady Halfa and 350 of them were handed over to the 19th Hussars. This regiment then marched by squadrons to Korti, 360 miles, at an average daily march of 16 miles, the daily ration being 6 lb grain and 10 lb dhourra stalk. They arrived in good marching condition. They stayed at Korti from 20th December to 7th January, 1885, received 8 lb. green dhourra stalk instead of dry stalk, and they improved during the halt. 155 were then detailed for the Desert Column moving via Gakdul Wells to Matammeh. On 30th December 40 horses proceeded to Gakdul, 100 miles, accomplishing the distance in 63 hours. They rested there 15 hours, and did the return journey of 100 miles, again in 63 hours. Six of them accomplished the return journey in 46 hours, and the last 50 miles in 7½ hours. There were no casualties. The 155 horses, including the 40 above mentioned, then proceeded on the 8th January across the Bayuda Desert with General Sir Herbert Stewart's Column, and up to the 20th January, exclusive of one day's halt at Gakdul, their career was one of 31 miles per day, with an average of 5 to 6 lb of grain and 2 gallons of water daily. They were allowed to graze on every possible occasion, but the grass of the Bayuda Desert is very dry and they ate little. At times they got mouldy biscuits, unfit for issue to the men. When the first advance on Matammeh was made they marched to the Nile without having received a drop of water for 55 hours, and only one pound of grain. Some 15 or 20 horses received no water for 70 hours. From the 20th January to 14th February they halted at Gubat, receiving no grain, but a ration of 10 lb dry dhourra stalk or 12 lb of green bean stalk daily. Two days before their return journey they received 6 lb grain daily. The first 75 miles of the return journey were performed on 4 lb grain and 3 gallons of water, after which water was stated to be plentiful, and 8 lb grain daily ration was supplied. During the period 8th January to 8th March, on which date they returned to Korti, the casualties were 20 killed in action, 19 died or destroyed from Debility and exhaustion, and 5 died or destroyed from other causes. The weight carried was reduced to a minimum, but averaged about 14 stones.

American Riding Horse.

During the South African War, 107,511 horses were purchased in the United States by the British Government. They were mostly small—from 14-2 to 15-1, and the majority were for Mounted Infantry purposes, though larger ones for Cavalry were at first selected. I am not acquainted with the number purchased for Cavalry during the late War, but I imagine that it cannot have reached a high figure, as requirements for Cavalry were comparatively few and could be met more or less from Home sources; and moreover, American riding horses do not altogether fill the eye of our Cavalry purchasers. The Irish and English standard of Cavalry trooper is a difficult one to compete with. To our minds the American saddle horse is more of the light harness type, and one can understand this with the amount of standard-bred trotter blood in the country, and the preference in country districts to drive in a buggy rather than to ride. All the same, the small horses purchased by the British Government during the South African War, many of which were range horses from Wyoming, Montana, Idaho, Oregon, and from Texas, were good hardy animals, suitable for the purpose required, and they were well reported on in South Africa. The standard of our purchases, I may say, did not quite meet the approval of General Carter, then Adjutant General of the U.S. Army, a great lover and judge of horses, who used to pay occasional visits to our Remount Commission. They were not his idea of saddle horses, but what was really passing through his mind was the better and more expensive type, suitable for Cavalry and Special Riding, two categories purchased by the American Government for Army purposes. Under the American Saddle Horse Breeders Association great endeavours are made to maintain an American saddle horse as a type. The progenitor of this strain was a thorough-bred stallion named "Denmark" foaled in 1839, and brought to Kentucky. During the Civil War, stock of this Kentucky strain performed most wonderful marches. Starting his first raid on 4th July 1862 from Knoxville, and returning to Livingston on the 28th July, Major-General J. H. Morgan with his Cavalry covered 1000 miles, capturing seventeen towns and destroying all the Government Stores. In July 1863, in

his Ohio raid he marched from Summansville, Indiana, to Williamsburg, east of Cincinnati, 94 miles in 35 hours. General J. E. B. Stuart, another brilliant Southern Cavalry Commander, with 1800 Cavalry and 4 pieces of Horse Artillery, made a rapid sweeping reconnaisance round the Northern Army, covering a distance of some 90 miles from Chambersberg to Leesburgh in 36 hours. Forrest's expeditions, Grierson's operations in Mississippi, Wilson's invasions, and Sheridan's turning movements and pursuits, are all reminiscent of the wonderful prowess of American horses of Cavalry of those days. Whether the present day American horses with their greater admixture of trotting blood can achieve such results it is difficult to say.

Indian Country-breds.

On the abolition of the old Stud Department, horse-breeding operations were commenced in India, and they continue to be controlled by the Remount Department of the Indian Army. The primary object of these operations was the production of horses of sufficient size and substance to meet the requirements of the Army in India, not only in Cavalry but in Artillery, and to render that Army independent of foreign markets. Such object has not been fulfilled in respect to Artillery for reasons previously explained, but operations have progressed with regard to the production of horses suitable for Cavalry, and in the grading up light horses and ponies of the country generally. English and Australian thorough-breds, and Arabs are imported or purchased in India for service in the horse-breeding circles of the Punjab, United Provinces, and Baluchistan, and the Government has a call on the young stock produced, purchases of young stock at about 18 months being made and sent to young stock depots for care, suitable feeding, etc., until such time as they of sufficient age to be issued as remounts. The Government undertakes also to raise and improve the best Indian strains of original pure Indian stock—Marwari and Kathiawar breeds, for service and distribution in provincial districts. A limited number of Arabs also are raised for the same purpose. Race meetings, with valuable prizes for country-breds, are held at various stations, and tend to give a

fillip to production on good lines, and towards more valuable animals.

The Indian-bred horses which went to France with the Indian Cavalry Divisions consisted of (*a*) those belonging to Silladar regiments and Imperial Service Troops, and (*b*) those belonging to British Cavalry units, the latter being the best of their kind. The specifications in height of Indian Cavalry horses are 14-2 to 15-1, and of British Cavalry 14-3 to 15-2.

A large number of the horses of the Indian (Silladar) Cavalry and Imperial Service Troops were weedy, undersized animals, unsuitable for Cavalry service in France. Many were also unsound—never got beyond Marseilles, and had to be cast. Under a Silladar system one cannot expect a very high-class trooper, but for light Indian Cavalry and service in his own country and in the East, the Indian country-bred justifies his comparative small cost.

With the greater outlay in respect to the mounting of British Cavalry units one naturally looks for something superlative, and it is questionable whether the necessary degree of excellence and suitability has been attained—at least to an extent justified by the outlay. Though the 17th Lancers reported highly on their animals in France, speaking generally as a class, and including both British and Indian Cavalry, I am distinctly of opinion that the Indian country-bred is not up to sufficient weight for service in a European country where heavy going is the rule. So many are weedy, leggy, and split-up, and moreover are excitable. A considerable number were evacuated for Debility, and showed a low standard of recuperative power. One Veterinary Hospital reported that the Indian country-bred was defective in his feet, and that in this class a high percentage of Navicular Disease existed.

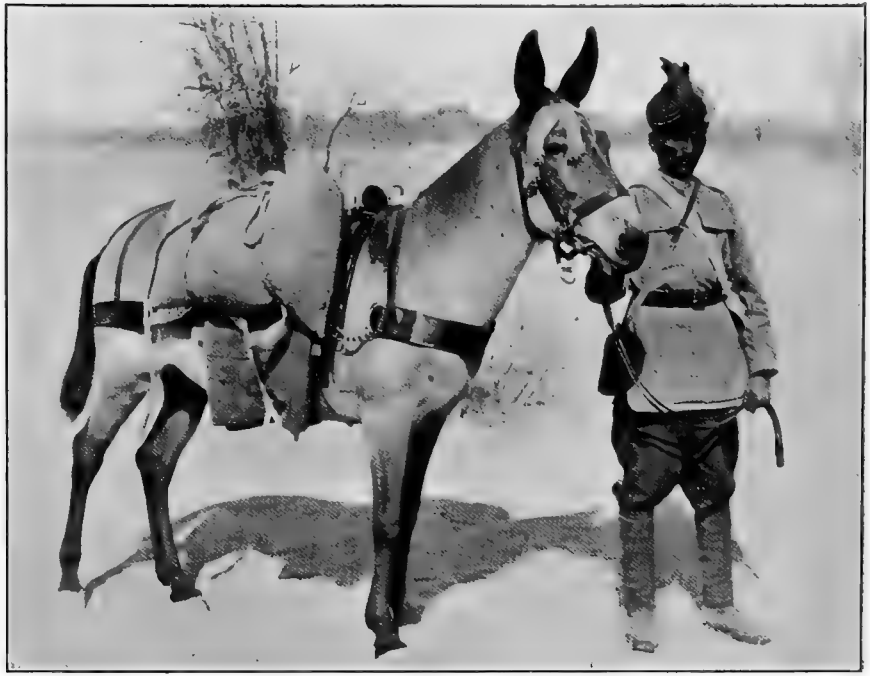
However, as the Indian Cavalry Divisions left France for service in Palestine, and Indian Cavalry Brigades took part in the Mesopotamian Expeditionary Force, where horses had a more favourable scope for real Cavalry service, it is to those theatres that report as to the merits of the Indian country-breds, and particularly of those better class of animals on the strength of British Cavalry units, should prove most valuable. I have no special information to form an opinion, but the glorious

achievements of the Cavalry arm in Palestine would certainly indicate that they had proved their merit and value up to the hilt. For instance, the 10th Cavalry Brigade of the 4th Indian Cavalry Division in Palestine accomplished a distance of 70 miles from Selmeh orange groves to Beisan in 35 hours, including halts and delays. The horses of despatch riders, of patrols and of many officers covered even 80 miles on that occasion. The total casualties evacuated to the Mobile Veterinary Section at the end of the period was only 15, and this after a month in the Jordan Valley and night marches aggregating 65 miles to the point of concentration. It is a performance which leaves no doubt as to the merit and fitness of animals.

It is very imporrant, in view of horse-breeding operations in India, that a more precise account of the better class of country-breds on the strength of British Cavalry regiments in war should be furnished, and a relative comparison drawn between them and those imported from Australia. No doubt in course of time this will be done. It is not definitely known how many actually participated in War, but the following table shows the number present with British units immediately prior to departure overseas :—

Regiment.	Operations.	Austra-lian.	Country-bred.	Arab
1st Dragoon Guards	France	157	392	
7th ,, ,,	,,	535		
6th Inniskilling Drgs.	,,	478	53	
7th Hussars	Mespot.	486	155	
8th ,,	France	12	20	482
13th ,,	,,	201	357	
14th ,,	Mespot.	373	171	
17th Lancers	France	220	332	
	Total	2462	1480	482

Since my return to India I have seen a good many Infantry officers' country-bred chargers, 14-1 to 14-3, both at the Front in Frontier Expeditions, and amongst those proceeding overseas to Mesopotamia as remounts, and without question they are of real merit.



SHOWING CONDITION OF PACK TRANSPORT MULES WITH THE WAZIRISTAN FIELD FORCE. THE LOAD IS 160 LB OF GRAIN.

Chapter VI—MULES.

In animal kind, the hero of the late World's War—as in all other Wars in which he has participated, that paragon of excellence, the mule, finds the premier place. He stands out prominently as a first class war animal, and under all circumstances, in all climates or situations, whether amongst the mud of France, in the deserts of Egypt, on the plains of India, or on the hill-tops of the Himalayas, in burning heat or icy snow, his achievements have been marvellous. He is as indispensable to War as a Commander of the Forces, and no history of War is complete without him. Any demerits he may possess are attributable to a psychology peculiarly his own, but his merits are double distilled, and little more remains to be said on that account.

There are, however, so many different breeds, types, and sizes of mules, and the military uses to which they are put are so varied, that it is necessary to dilate on them severally.

Specifications as to height and substance vary according to the theatre of war and for the purpose required, but under British requirements the following standards were commonly adopted during the war:—

Heavy Draught Mules.	Up to 16-2 or even 16-3.	Weight about 1300 lb.
Light Draught Mules.	15-0 to 15-3.	,, ,, 1100lb.
Pack Transport.	14-1 to 15-0.	

Indian specifications are somewhat different to these, and are roughly as follows:—

Light Draught Mules.	Same as light draught horses.
Ordnance Mules (Mountain Artillery).	13-2 to 14-1.
Equipment Mules.	13-0 to 14-0.
Transport, draught and pack.	12-1 to 13-3.

American Mules.

Of all countries in the world, none can surpass the United States of America for the production of mules, nor compete with it in general resources. The mule population of the States amounts to nearly 3,000,000, and the fountain never seems to

run dry. During the South African War, the British Government purchased 80,524, and though I have no actual figures to guide me, I should say purchases during the late War amounted to considerably over a quarter of a million. The strength of mules in the British Expeditionary Force, France, alone mounted to roughly 90,000.

All sorts and sizes of mules are bred in the United States, from the small miner 12-3 or 13-0 to the magnificent sugar mule 16-2 and over. It pays better to breed a mule than a horse, and the market is for mining, lumber trade, and the cotton and sugar industries of the South. The real home of the American mule, and especially the large mule, is Missouri, though lighter mules are raised in Texas. If the magic names of Lathrop, Missouri and Kansas City are whispered into the long ear of an American mule he will immediateiy start a conversation about his old home, blue grass, Indian corn shucks and stover, his fine big mother, his French and Spanish ancestry on his father's side, and he will air his views on stock-yards and "niggers" generally. The American mule is wonderfully docile, and to my mind quite the most handsome creature of the genus Equidae, and loveable withal. His power is best appreciated by standing close up to him: at a distance he may look mean.

As a rider, a mule is of little value, a supreme will and an iron mouth, as a rule, prove the drawback.

Mr. Malcolm Moncrieffe of Wyoming, through whom we purchased a large number of horses during the Boer War, used to hunt a St. Louis mule in England. He was not equal to taking a line of his own but he followed a lead all right. Mr. Moncrieffe's only objection was that he never could talk to his friends, as the aristocratic hunter was wont to turn up his nose and snort at the plebeian and curious hybrid. The foreman of a depot in the United States speaking, of a 14 hands mule, "Jack," which I sometimes rode, said to me on one occasion: "That mule will give you a fall some day. I have never known a mule that did not give a man a fall sometime." "Jack" put me into a barbed wire fence most perfectly. He could round up stock, and gallop like smoke in the company of horses, but by himself he lapsed into mulish ways. Vain as a peacock, with his tail trimmed in the American fashion, a white polo

lock on his mane—which he knew he possessed, full of spirits, and with affection like that of a dog, crying his heart out in the corner of a corral when the time came for his shipment to South Africa, summed up the nature of that handsome little fellow—and of mules in general. Their happy nature goes a long way towards their success. They have a habit of worming their way into the hearts of our soldiers, and very soon friendly relations are established that work for the common good. Their endurance, their comparative freedom from sickness, their pluck and stout heartedness when properly treated, their ability to perform work under adverse circumstances and when short commons are necessitated, are their usual attributes; and their employment in war is a great economic factor. These remarks stand for all mules, whether American or otherwise.

The majority of American mules employed in the various Theatres of War were for light draught purposes, supplying the place of light draught horses in Ammunition Columns, etc., of Formations, and receiving the same rations as light draught horses. To the latter factor the superiority of the mule over the light draught horse is greatly ascribed. If well fed, he thrives on work, and in times of idleness he will quickly get fat. As an instance of ability to stand the vicissitudes of campaign I will quote again the Somme operations in 1916. This offensive period resulted in 16,074 Debility (poor condition) cases evacuated to Veterinary Hospitals on Lines of Communications, of which total only 404 were mules. The percentage of inefficiency was 4·42 for horses and ·61 for mules; horses suffered therefore seven times more than mules. During the winter seasons they gave us far less trouble than horses (1 to 3, about) from skin disease, and Respiratory disease was practically *nil*. These are very strong arguments in favour of the mule. I call to mind the limbered General Service Wagon mules of the 17th Lancers going through the streets of Abbeville on a snowy day. They were pictures of health, and the bloom of their coats shone in spite of the snow. It is only one instance of many, and it made one feel proud to belong to our Army.

The pack mules of Infantry and Signals, smaller in height, were also very good. Cavalry, for their Machine guns, by reason of more rapid movement, have pack horses.

Mountain Artillery of India.

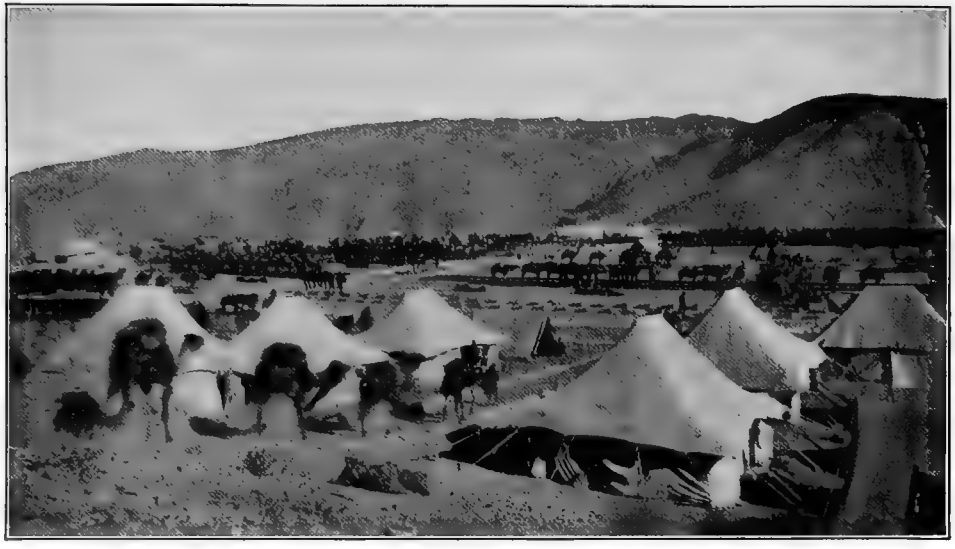
The mules of Mountain Artillery in India, both British and Indian Batteries, deserve special mention. They seldom ail anything, and of all units in the Indian Army they give the least trouble to Veterinary Service both in peace and war. They are of a superior class, sturdy and stout, 13-2 to 14-1, with good straight backs—an essential feature of a pack mule. They are household words in a matter of condition and fitness, and they have the further merit of being unshod, for the reason that they are all the more able to get better foot-hold in ascending the mountains. They are a Cosmopolitan assembly, with numbers hailing from the United States, Argentine, China, Cyprus, and the Punjab with American ancestry. I remember the first shipment of North American mules (brand G.H.) purchased at Lathrop, Missouri, by Major Gough in 1902 from Messrs. Guyton and Harrington. They were perfection in mule kind. Mr. Guyton expressly desired Major Gough to select the very best he could find, to let the Indian Government, as he said, see what the United States and his firm could produce. I daresay some of these original G.H. mules are still in existence. They were very highly appreciated.

Indian Transport Mules.

Indian Transport is Pack and Draught, the mules ranging up to 13-3; the pack load is 160 lb and the draught a load of 10 maunds or 800 lb. for a pair of mules in an A.T. Cart. Mules are either Argentine, Chinese, or Country-bred. The record of the Transport mule of India in War is now remarkably good, inefficiency in recent Frontier expeditions being usually about 2·6 per cent. or 3 per cent.—a much improved state of affairs from campaigns of former days in which sore-backs abounded.

Perhaps the most trying circumstances under which Indian Transport animals have laboured during Indian expeditions was the Tibet mission of 1904, and the merit of the mules which took part is well illustrated in the Veterinary Report of that Mission. The Senior Veterinary Officer of the Mission remarked as follows :—

"I cannot speak too highly of the Mule Corps engaged in Tibet. They did rough work daily over snow, ice, etc., and in all sorts of weather, including frost to the extent of 57 degrees.



No. 27 Field Veterinary Hospital (Camels),
Kolkai, Waziristan Field Force.

There is apparently no hardship that this animal cannot endure when well looked after. I should like to mention the excellent work done by the Argentine mules of the 13th Transport Corps, and their condition under hard work. To my mind, if such hardy, capable animals can be procured for transport purposes, the sooner we seek them in Argentine districts the better. Our mules passed through snow, ice and rain, and though crossing mountains close on 17,000 ft. very few were lost from heart failure."

"All the mules on the advance were unshod, and as long as their feet were kept trimmed all went well: there were few cases of lameness."

Mules in recent frontier expeditions also have not been shod.

It will be noted that the small Argentine mule is very favourably mentioned in the above report. It is a very far cry from South America to the high plateaux of Tibet, and the merit of the animal is therefore the greater. The Chinese mule, though not so handsome as the Argentine, is a very strong, stout, hardy mule, with a reputation that is hard to beat. A considerable number were captured and purchased by the China Expeditionary Force in 1900-01 and did so well, particularly in draught in the "Pekin Carts," that China has been greatly drawn on by the Indian Government for small mules ever since. The country has also some very fine larger mules, 15 hands and over, which are used for riding, and by the wealthy Chinese for their Pekin carts. The Indian country-bred, under good feeding and care, has also done his part well in many theatres of War.

The little Abyssinian mule, a game fellow, went through the Somaliland Expedition of 1904 in pack work with flying colours.

The South African mule, as a draught animal, finds great favour in his own country, and a shipment of 250 to India, for Mountain Artillery, in 1892, was most satisfactory.

Equipment Mules.

The equipment mules of Battalions, Pioneers, and those of Sappers and Miners are of the same strains previously mentioned. They are slightly bigger and better than Transport, and their record is all that could be desired.

Long may we have mules to help us to fight our battles.

Chapter VII—DONKEYS.

I have a sneaking regard for donkeys in warfare. The French Armies used a considerable number of them for packing up ammunition to their troops in the Line during the late War. They were driven across country in mobs of about twenty, and were able to pick their way round the shell holes.

If properly looked after, they are remarkably free from disease and give Veterinary Service very little concern. The apportioned load according to Transport Tables is 1½ maunds (120 lb). It is rather an inconvenient amount, as so many of the items for Transport are arranged or packed by maund weights. A better pack-weight would be two maunds—one maund each side, and only donkeys that are equal to that weight should be employed.

In the Tirah Expedition of 1897-98 there were 8297 Government donkeys and 5557 hired donkeys employed. The weight carried was 2 maunds. They maintained their condition remarkably well, and the hired animals were even better than those of Government. In the Chitral Expedition of 1895 many were employed, and they were well able to negotiate a two maund load on the level, but somewhat failed in scrambling over rocks under that load. It is all a matter of a suitable saddle and proper adjustment of loads, which for small animals should not be of a bulky nature. Moreover, work in short stages, especially in hilly countries, gives the best results. During my frequent visits to the Frontiers recently, I have noticed lots of very good donkeys that I am sure are equal to a two maund load if properly fed and driven along quietly. One man to twenty donkeys would be economical transport, and it goes without saying that they would require constant inspection to ensure that their backs were free from injury, and that a suitable ration should be assured to them. For road making and mending, carrying stones and earth, they fill a most useful position.

The Tibetan donkey, used during the Mission, was reported on as a wonderful animal for his size, and a load of two maunds was an easy task. On the other hand the Somali donkey, which is a sturdy animal with a good back, was apparently

equal to only one maund in most cases when employed during the operations in that country in 1903. A large number was employed during the Nile Expedition of 1884-85. They were mostly hired, and had no disease.

The record of donkeys in the Kohat-Kurram Force of 1879-80 was bad, for the reason that so many of the animals were very young, or old and unfit; there was no sort of proper selection.

Very large numbers of donkeys are used for transport purposes in Persia. In South West Persia alone there are probably 200,000. The Persian donkey is small, but strong and enduring, and he is equal to a load of 130 to 200 lb. The practice of Local Transport Companies is to shoe them with a broad webbed shoe for work over the rocky road from Bandar Abbas into the interior.

Afghanistan also is well endowed with an exceptionally hardy donkey, something of the same nature as our frontier animals.

Chapter VIII—PONIES.

The knight of old, when on march route, bestrode his palfrey for his greater comfort; the present day officer is permitted to include his polo pony as a charger for practically the same reason. Officers of Services and Departments, not required to do fast work, are supplied with small horses and ponies as their chargers; and the riding animals of units of Transport and Mountain Artillery in India are ponies ranging from 13-3 to 14-2. They are universally satisfactory in war for the reasons that they require a lesser ration than horses; they are, as a rule, easier and more comfortoble to ride, especially for the inexperienced; and if the equilibrium of the rider suffers by default, mother earth is somewhat nearer. Individual ponies as riders have been made great use of during the late War with marked success. They were used considerably for Mounted Infantry purposes during the War in South Africa, and without question certain classes of them performed very satisfactory work. The Cape Colony and Free State pony for instance, native to the country, was quite able to keep on his legs and cover long

distances. Plumer's Rhodesia Regiment, in March 1900, accomplished a distance of 70 miles in 26 hours and not a single man or animal dropped out. On the 22nd January 1879 a strong body of mounted volunteers under Lieut.-Colonel Redvers H. Buller, of the Bechuanaland Field Force, between 1 a.m. and 11 p.m., that is in 22 hours, covered a distance of 70 miles over rough hilly country, the average height of the animals being 14-2 to 14-3. The small Basuto pony in those regions is renowned for his stamina.

A number of Khirgiz ponies from Asiatic Russia found their way to the South African War, and the history of the journey of these hardy, short legged, straight backed, broad quartered small animals (seldom over 14 hands) is most interesting. Six or eight days were occupied in journeying by road from their place of origin to Orenburg, where they were entrained to a station on the River Volga (either Samara or Saratov), then placed in open boats and floated down the Volga for four to seven days to Tzaritzan, thence by rail to Fiume; and of all the Russian cobs they presented themselves for purchase in the best condition. They had come 3000 miles and travelled for one month to join His Majesty's Forces, and for subsequent shipment from the Port of Fiume to South Africa.

Indian Transport Ponies.

In addition to the riding ponies above-mentioned, the Indian Army maintains a number of pack and draught ponies, organised, as in the case of mules, into Corps. The height of these animals is from 13-0 to 13-3.

India is essentially a country of ponies and small animals, and though there is a considerable number of indifferent specimens, the resources of the country must be made use of to the best advantage.

For pack purposes the Indian pony is not an unmixed blessing, and his history in War is far from satisfactory. He has not the stamina of the mule, is more subject to debility, and is much more prone to sore back. He is better placed in draught, and when suitably selected and properly looked after, he proves satisfactory in this sphere. A few extracts from the Veterinary Reports of Expeditionary Forces will make this clear.

KOHAT-KURRAM, 1879-80. "The animals were not on the whole satisfactory. Every description of pony was sent to the Force, from the diminutive grass cutter's *tattu*, flat sided, narrow chested, rubbing his hocks together, to the big ragged, sharp spined, high withered *ekka* pony. They had not the same digestive powers as mules—required more attention in the preparation of their grain and selection of fodder, and their different shaped backs demanded greater care in the fitting of pack saddles. Compact, round barrelled animals kept their condition and did well, a number of small ones from the Bombay Presidency performed excellent service."

CHITRAL RELIEF FORCE, 1895. "Ponies did not do well, excepting those of Jeypore State Transport. They were used as draught from Nowshera to Durgai, and were sent as pack over the Malakand. They failed as pack over the rough and difficult roads."

TIRAH EXPEDITIONARY FORCE 1897-98. "There were 10707 Government ponies employed, and report states that they were not as satisfactory or efficient as they might have been, two reasons being that they were physically unfitted for army pack animals, also that they fell away after purchase. Hired ponies did better, the reason being that owners looked after them well. Of the Jeypor and Gwalior Transport Trains, report again states that "no ponies could have done better or worked harder than did the ponies of these two trains." They were properly organized, their equipment was perfect, and they worked both as pack and draught.

The Kashmir ponies with their own *Sunka* equipment also did good work, and 400 of them were eventually purchased by Government.

They were accustomed to Hill work and it is therefore unfair to compare them with Plains ponies.

TIBET MISSION 1904. "Four *Ekka* trains were organised, the ponies being drawn from various parts of India. They were a very mixed lot, and suffered severely from excessive cold, many died, and it was only by building high turf walls that mortality was reduced.

The Tibet and Kashmir Pony Corps were put to great trials in long marches with minimum quantities of food (3 lb grain per day) and extremely severe weather, and a large number died (592 died and 211 destroyed) in the two Corps. It was reported that no careful selection could have been made in these Corps.

The Tibet pony proper, as obtained in Central Tibet, was most useful, and the First Mounted Infantry, commanded by Captain Ottley, was almost entirely composed of these animals. Between 12-2 and 13-3 hands, big of bone for their size, not by any means handsome, and with an enormous coat of hair, they carried their 14 stones day after day over all sorts of ground in splendid style."

SOMALILAND FIELD FORCE 1903-04.

Somali pony	An extraordinarily sound little animal, capable of travelling great distances on little food and no water.
Arab	Adapts itself quickly to the requirements of the country.
South African English Argentine Russian	About equally hardy, though they suffer more from want of water that the Somali or Arab.
Indian Chinese Abyssinian	Quite unable to stand hard trekking in Somaliland.

CHINA EXPEDITIONARY FORCE, 1900-01. "The Mongolian pony is a hard, sturdy, short-legged animal, from 12-0 to 13-3. A fair number was bought or captured by the Force. They were found to be much more suitable for draught than pack, their conformation ill-adapted to our pack equipment, and sore-backs resulted. They were also found difficult to keep in condition, and were reported as badly-mouthed, sulky, ill-tempered, and difficult to manage except by Chinese, who are used to them. The mares are much used for the breeding of mules, which, as I have previously remarked, are a much better and more suitable product for military purposes.

Recent Expeditions, North-Western Frontier Force, Waziristan, etc. The records of recent expeditions show a marked improvement, not only in the quality of the Indian country ponies employed, but in their work generally. Even then they have not shown the same degree of efficiency as mules. The draught pony corps of N.W. Frontier Force up the Khyber fell off in condition during the extreme heat of June and July 1919, and their feet were somewhat neglected in shoeing. Mules have a distinct advantage in their ability to perform work unshod. Excepting perhaps in wet weather, when maceration of the horn is more likely, many country-bred ponies also could go without shoes—at least hind shoes. One unit in Waziristan did so quite successfully. The draught ponies of the Force in Waziristan, during a less exhausting season, performed very satisfactory work and were in very good order. The most cases of sore-backs were in Pack Pony Corps, this class of ailment being much less in mules.

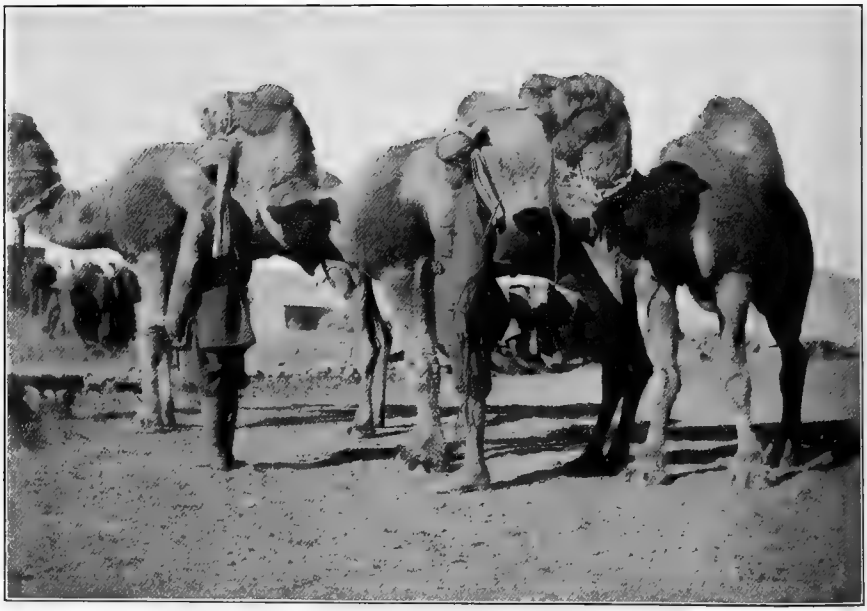
There is no doubt that it is much more difficult to maintain the utility of pony corps than mule corps, and serviceability of the former therefore resolves itself into more careful animal management, including those most necessary items, adequacy of ration and a proper water discipline, which are so apt to be at fault in war. When these are in force, and suitable ponies selected for the purposes required, there is no reason to suppose that pony transport will be otherwise than efficient. Indian country-bred ponies are more suitable for draught, but the necessity for pack in the frontier regions must always be borne in mind, and animals suitable for the dual purpose selected.

Chapter IX.—BULLOCKS.

Bullocks are unsatisfactory war animals. They are of no use for the transport of fighting formations, and their only place is for transport service on Lines of Communications. In India their great drawback—and it is a very serious one, is their proneness to the dire contagious diseases which are extant in that country. It has been the experience of all campaigns in India that within a very short time after mobilization either Rinderpest or Foot-and-Mouth Disease, or both together, present themselves, crippling all useful service and creating untold inconvenience. There is no escape from these two diseases. They are, like the poor, always with us. I have fully remarked on them in a previous section, "Wastage of Animals in War," and further reference is unnecessary. One feels sorry for the old "Bile of India," but where reliability is concerned, it must be ruled out. The transport bullock of the present day, both Siege Train and Army Transport, is not of the same excellent standard that existed when I first made his acquaintance 30 years ago. In ten years I see a vast difference—and it is only to be expected when the production of stock in India, and particularly of good stock, is pushed into the back-ground by the more profitable and increasingly valuable crops of cereals and cotton.

Were it not for his serious contagious diseases and the difficulty of controlling their spread under circumstances of movement, I should advance him in the scale of military utility; for a pair of good bullocks are surprisingly equal to the haulage of heavy loads, considerably more than the allotted army load of 10 to 12 maunds (800 to 960 lb) provided the pace is slow, the stages are short, diet is sufficient (it usually is for Bullocks) and rest permits the act of rumination. He is certainly a willing slave, and he is not very much impressed with fine ideas about harsh treatment. His resistance to disease is considerably influenced by breed and locality. For instance, Southern India animals, *e.g.* the Mysore, are more readily attacked by Rinderpest, and contract the disease in more virulent form than

BULLOCK TRANSPORT IN WAZIRISTAN FIELD FORCE.



SHOWING GOOD CONDITION OF CAMELS UNDER "STALL FEEDING," IN WAZIRISTAN FIELD FORCE.

Northern Bullocks of the United Provinces and Punjab, whence the majority of our Army Bullocks are drawn.

In days gone by, heavy artillery batteries employed Bullocks of the Siege Train Class for the Wagons, and from an animal management point they were perfect.

Putting aside the matter of contagious ailments, which constitute the most serious obstacle for the successful employment of bullocks in war, and probably let one down at the very moment when there should be no hitch in proceedings, I have gone carefully into all the records and Veterinary reports of the various Expeditions on the Frontier, and there is, after all, something to be said in their favour. I take little notice of the Kohat-Kurram Force of 1879-80, as the bullocks on that occasion, which were considerable, would appear to have included a large proportion of physically unfit animals of a type unsuitable for pack work, and moreover one cannot blame animals from suffering terribly from sore-backs when no proper equipment was at first in use. It is inviting disaster to sling loads by ropes over a pad and folded *jhool* without a *soonka.*

The Inspecting Veterinary Officer of the Chitral Relief Force, in spite of 1290 having died from Rinderpest out of 6363 hired pack Bullocks, and 3675 cases of Foot-and-Mouth Disease, could still say "Notwithstanding all, by dint of unceasing inspections, withdrawals, and isolations, the bullock pack transport kept on moving, and did some of the best work on the campaign."

With 4413 Government, and 9314 Hired Bullocks, and with one outbreak of Rinderpest and two outbreaks of Foot-and-Mouth Disease, the Inspecting Veterinary Officer of the Tirah Expeditionary Force reported that "There were no faults to be found with the bullocks . . . . On the whole they were a good lot." They were only used for wheeled transport; no pack.

Again, on the Tibet Mission, after the stamping out of Rinderpest and Foot-and-Mouth Disease. "The Bullock Cart Train, the first and second Bullock Pack Corps did excellent work between Silliguri, Guntak and Lingtam for the greater part of the expedition, but long days and heavy roads told in

the long run, and many were returned to India, while others, unsuitable for cantonments, were sold."

During the recent Frontier Expeditions Bullock Corps were severely hit by these two diseases, and by occasional heat exhaustion, chiefly at the outset; but subsequent proceedings were satisfactory and the animals maintained a good condition. It is anticipated that Rinderpest will be excluded from military bullocks in future by a process of inoculation rendering them durably or permanently immune before they go on Service, but we shall have to rely on the old methods of isolation against Foot-and-Mouth Disease, as even previous attacks convey only a short lived immunity.

Bullock Transport was greatly in vogue in the South African War, spans of 12 and 16 bullocks in heavy wagons being the method of employment. It was quite satisfactory for slow moving troops, but here again a contagious disease was encountered — Pleuro-pneumonia Contagiosa, against which inoculation was practised with success.

In closing this section I should like to remark on the great boon which has been conferred on the Indian Army in War on the Frontiers by the establishment of Dairies, the majority of the animals being buffaloes. There is great merit in the procedure, and it is just as easy to get these animals up near the front as it is meat on hoof. Our troops in Fraece also owned occasional cows, and Motor Horse Ambulances belonging to Veterinary Service offered no objections to their transport from place to place, in fact there was no reason why the procedure should not have been made more general, particularly for the benefit of Casualty Clearing Stations.

Chapter X—YAKS.

The Tibet Mission of 1904 had three Yak Corps of approximately one thousand Yaks each, and only 70 survived. Anthrax. Rinderpest, Pleuro-pneumonia, Foot-and-Mouth Disease, Debility consequent on work in too low an altitude, and bolting into the jungle, disposed of the remaindsr. A pure Yak (one-third of them only were pure bred, the rest being Zooms, or half-breds) cannot live in low regions. Tibetans seldom ask them to go below 8000 feet. They were down to 2300 feet at times, and under such circumstances a pure yak will pant, and lie down every few yards, and rapid emaciation ensues.

Yaks are useless as transport animals. They can only travel from six to eight miles per day, require two days a week rest, and an enormous amount of grazing. Two maunds is all that a yak can carry, and if pushed beyond his pace he lies down and sulks. His habits are distinctly lazy, but when compelled to go he is sure of foot, and can negotiate the roughest cliffs possible.

Chapter XI—CAMELS.

Cyrus the Great of Persia (559 B.C.) had great ideas of Tactics. At the battle of Thymbra, fearing the superiority of the Cavalry of Croesus, which had a reputation for the skilful use of the long lance and for the adroitness with which they managed their horses, he mounted his Cavalrymen on his baggage camels, and placed them in the first line. The horses of the Lydian Cavalry were so alarmed at the appearance and smell of the camels that they recoiled in confusion, and although the Lydians dismounted and engaged the Infantry of Croesus, they were defeated.

The above is certainly a unique utilisation of the camel, and it is distinctly worthy of special record in the merits of that animal.

The uses to which camels are put in the Army relate chiefly to riding, and pack transport. On certain occasions they have

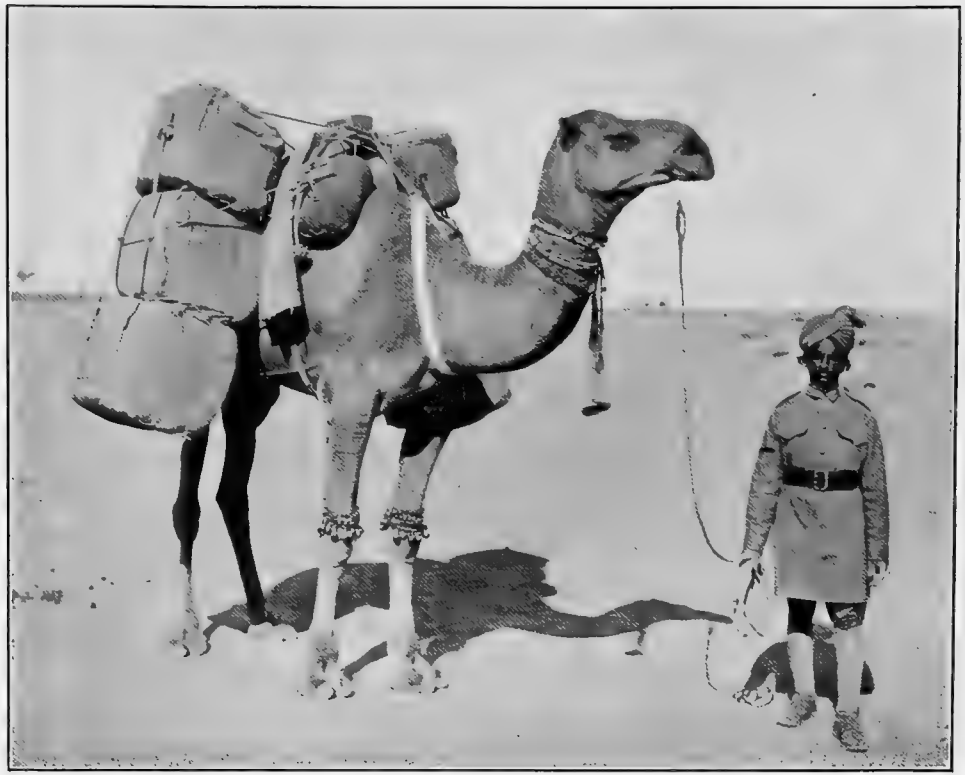
been applied to Artillery draught, and in certain districts, as in Karachi and Western India, it is no uncommon sight to see them yoked to low wheeled carts, performing carrying duty. Napoleon employed them for mounted infantry purposes in Egypt and Palestine, Napier in India, and we ourselves in Egypt, with marked success in properly organised Corps for mounted infantry purposes. In Persia, in early times, they were used for light Artillery (Zemboureks) a small gun being mounted on a wooden saddle.

Riding camels are quite distinct animals, differing from baggage camels as race horses do from other breeds of horses. There are certain breeds that are specially suitable for riding purposes—the Bikanir and Rajputana, famous all over India for their swiftness, the Hejeen of Arabia (Oman), and the Bishareen of the Soudan.

The paces of riding camels are the amble and trot, the former being 4 to 4½ miles an hour, and the latter 7 to 8 miles an hour. The gallop is seldom required, and is very unpleasant. Instances are quoted of long distances covered, such as 100 miles in 24 hours. Fortune mentions an Arabian camel having accomplished 225 miles in 28 hours, and General Chesney crossed from Basra to Damascus, a distance of 958½ miles, in 19 days, a daily rate of 50 miles. The capability of a body of riding camels, each with a man and his kit, weighing in all 400 lb, nevertheless must not be considered to exceed 25 miles a day, with a halt once a week.

The real importance of camels from a military standpoint is, however, as baggage or pack transport animals, and it is in this respect that my remarks will specially apply. Questions of structural peculiarities, constitution, idiosyncrasy, management, disease, are common to all breeds and classes.

There is no more useful animal in existence than the baggage camel, and for military purposes under certain circumstances he is absolutely indispensable. His merits are that he can, as as an individual, carry heavier loads than other transport animals, perform work under circumstances or situations unsuitable for other forms of transport, and his cost on purchase and for maintenance, on their face values, is reasonable. His temperament is peculiar at times, due in a great measure to



CAMEL UNDER LOAD OF 480 LB (6 MAUNDS).

the fact that he is a male living in a community of males and permitting his passions to dominate him, particularly during the *Musth* season. Were he made neuter, he would be just as useful for military service, as has been proved, and even *dachis* would be able to enjoy his society without any display of unseemingly behaviour. The more one is acquainted with him, the more his merits appeal to one; and I know no animal that repays the kindness and considerate care bestowed on him by his attendants and supervisors as he does. It is just this attention which makes all the difference to him as a serviceable animal. Were I a young man at the beginning of my career in the Army, there is nothing I would like better than to have the command of one or more Camel Corps, to prove the utility of camels to the highest degree by rational treatment, and to remove them from that Slough of Despond into which the History of Wars clearly shows they have been plunged. It is, I think, in many cases idle to talk about demerits of this animal. Personally I do not altogether acknowledge them, as inefficiency is not in the main inherent in the animal itself, but in point of fact is the outcome of ignorance of animal function, injudicious management, and circumstances inseparable from the conduct of war.

Reading history of animals in war, one stands appalled at the dead wastage of camels; and if my remarks are strong, they are only made so in the hope that the slate may be washed clean, and that our future figures entered thereon may show better reading. In my previous section entitled "Wastage of Animals in War," I showed the enormous losses in camels that had been experienced in various campaigns, and it is perhaps unnecessary to refer to them again. At the same time it is important to show that the virtues possessed by camels have been played with, and that a misunderstanding of their nature and capacity for work as animal machines lies to a very great extent at the root of their shortcomings.

It is very commonly supposed that a Camel is possessed of phenomenal endurance, to fit in with which he is specially endowed with a series of water cisterns in his stomach, and a hump as a food store. In other words he carries his rations in

(not on) his person—is an expense store in himself, and proof against privation. The idea has been dwelt on by many writers to a fanciful extent. He is presumed to have the courage of a stoic, yet without intelligence, and he drops down dead.

Was there ever any greater fallacy? The capacity of the so-called cisterns is a quart on the right side of the stomach and about a gallon on the left side. The contents are a mixture of food, water, and mucus. The hump consists largely of adipose tissue, and though its size and firmness are indications of health, and it will waste with privation, it is no more of a larder than the fat on one's own body. Apart from disease, to which I will presently refer, the stoic dies from exhaustion induced by privation of food and water; and it is the intelligence of the human being who is constituted his mentor that is at fault—not the camel's. Until this is realized, grave loss of camels will result. No human, animal, or mechanical engine can perform work without fuel and water. It is a very elementary proposition, and it is responsible for a large amount of the demerits ascribed to camel kind, notably disease, death without apparent cause, heat apoplexy or exhaustion, inability to stand climatic changes, etc.

The Afghan War of 1878-80 cost us close on 60,000 camels (including desertions) and the causes of such heavy wastage were commonly ascribed to the following :—

(i) "Scarcity and indifference of food."
(ii) "The great strain thrown on the animals at the commencement of the campaign."
(iii) "The employment of a large number of camels only accustomed to the plains of India."
(iv) "The severe weather of the winter and early spring."
(v) "The necessity of employing the animals during a season of the year when at ordinary times they suffer perennially and are uniformly given rest."
(vi) "The uselessness and ignorance of the men sent as attendants on Government camels."

I wish specially to draw attention to the factors of Food and Man, and particularly to the Food, which was not only scarce

but indifferent in quantity. In the old Kabul papers I find the following scale laid down :—

Camels on command	3 seers Barley	}	10 seers Bhoosa or equivalent in cost of any other fodder.
,, in cantonments	1½ ,, ,,		
,, on fatigue duty	2 ,, ,,		
,, at graze	1 ,, ,,		No Bhoosa

The amount of Barley (a very inferior grain to the Gram of India for working ruminants) cannot be considered excessive. I find no reference in any report to Bhoosa, but considerable stress is laid on the inability to obtain grazing, and what grazing existed was not of a kind the animals were accustomed to. Grazing has always been the basis of Camel feeding in every Camel country, and the estimated time per day to obtain a sufficiency of aliment is six hours. What possible grazing is procurable at all seasons of the year amongst the rocks and mountains of the North-West Frontiers? And what time can be devoted to grazing, even if the military situation permits of it, is difficult to imagine. It is quite an impracticable idea on Service. The wretched animal has to fall back on his grain ration, administered by men tired out with marching, and he is lucky if he gets a portion of his scheduled amount. It is a picture that is applicable to any theatre of War.

The Report above mentioned goes on to say :—

"It is a well known fact that no amount of grain will serve to sustain Camels that do not get their necessary amount of grazing. For military reasons it was deemed desirable that the troops should push to the Front in November 1878 without halting. The marches were long and the roads indifferent. The baggage animals often came in at 5 a.m. having marched from 8 o'clock the previous morning and again were on the move by 10 a.m., so that the animals had time neither for grazing nor resting."

It is an old story, carrying profound lessons. Experience is often dearly bought, and the lessons should therefore be the more appreciated.

Thank goodness we have broken away from many old ideas of darkness and empiricism in regard to the management under war conditions of this indispensable animal of transport. There still, however, remains a lot to be done to put him on a better

plane of health, efficiency, and merit generally. Officers and men know him now more intimately, and the personal factor of man makes for his greater usefulness. Stall-feeding in practically the same manner as in other military animals has done wonders in the reduction of the disease Surra, as well as adding to his increased power for work. We have progressed very considerably in recent times, as the records of sickness and inefficiency, and more especially the condition and appearance of our service camels, distinctly and surprisingly show. Unfortunately, with work up the river beds in Waziristan during the past hot weather there has been an increase of Surra over the past year, from the prevalence of biting flies. Deaths from heat exhaustion, cases of night blindness, and a considerable number of sore-feet from traversing river beds too, have sent up inefficiency. Camels' feet were never intended for water; and in normal times it is the wise custom to refrain from work in the middle of the day; indeed owners of camels do not, as a rule, work them from the middle of May to 1st October. If operations are to continue in these regions in future years it would seem that the Camel would have to be equipped with goloshes on his feet, goggles on his eyes, and a Dolly Varden hat on the top of his head. Having a supercilious demeanour at any time, he would look a real gem so attired, and he would prove a fortune for the "Movies."

The carrying power of a camel depends on the breed, the climate in which he is employed, and the distance to be traversed. The usual load of an Indian Camel is 5 maunds or 400 lb. *e.g.* five bales of Bhoosa—two on each side and one on the top. An equal number on each side and none on the top, say three bales of bhoosa on each side, or a total of 480 lb, is a much better balanced load, and the removal of any article from the top has saved many hump-galls. Moreover, ability to carry extra work on occasion is a direct return for the good food and attention which have been bestowed on the animal, In Algeria, Morocco, Tunis and Tripoli the load is from 300 to 400 lb, in Egypt from 350 to 550 lb, in Syria, Asia Minor, Persia and Tartary 550 to 600 lb. Civilian Camels engaged on local duty at present in the Waziristan Force at Dera Ismail Khan are

View showing circumstances under which Camels have to perform in Waziristan Field Force. The road track is along the river bed, and the river is crossed and re-crossed.

carrying from 700 to 1200 lb, twelve bales of Bhoosa (960 lb) being a common load.

With regard to the merits of different breeds of Camels; during the Afghan War of 1878-80 the plains camels were preferable for service on the hotter or Indian side, but were reported on as useless for the higher, colder regions. Of the plains camels those of Bikanir were superior to the Punjab, and the latter better than the Sind. Of the Punjab camels the best were obtained from Rawalpindi.

The Salt Range Camels with Corps at present in Waziristan are in excellent order. A consignment of beautiful Persian camels obtained last year nearly all died during the heat of summer in Waziristan.

In the Nile Expedition of 1884-85, the Delta camel of Egypt, a large, heavy, powerful animal, used for carrying loads on the cultivated lands of the Delta, was at first thought unsuitable for the Desert, but events proved him to be most satisfactory, and he withstood the desert marching nearly, if not equally as well as other breeds. A Battery of Artillery with Delta camels marched the whole way from Cairo to Matammeh across the Bayuda Desert.

Crossed Delta and Desert are useful animals. The Bishareen is a desert bred animal, small, and essentially a riding camel.

The Kabbabish camel of the Bayuda Desert is larger and stronger than the Bishareen. He was principally hired when our own transport broke down during the Nile Expedition. As he subsists on grazing entirely, time (which can ill be afforded) is necessary to admit of a grazing system to be carried out.

A big, soft camel with an exceptionally large hump is found in the Dongola District. He is almost impossible to fit with a Government saddle.

The Arabian camel sent from Aden to the Nile Expedition was well adapted for riding and baggage purposes, and proved equally as good, if not better than any employed.

The remarks of the Veterinary Inspector, Lines of Communication, of the Somaliland Field Force in 1904, are well worth quoting, as the country is essentially one for the employment of Camel Transport. He says :—

"A more cosmopolitan array of camels, both riding and burden, has probably never been seen in any campaign."

"Riding camels were Bikanirs, Arabs, and a few Egyptian."

"Burden camels were Indian, Baluchi, Arab, Somali and Abyssinian."

"All did good work if they were good specimens of their kind to start with, but the Bikanirs carried more and outlasted the other riding camels with great ease, so long as they got water and food fairly regularly."

"Of the burden camels the Indian and Somali bore the heat and burden of the day, and outmarched and outlived the Arabs and Abyssinians. Where it is possible to water and feed them, the Indian camel will outlast the Somali also, but when the pinch comes, and they have to go on little food and no water for days and days, the Somali camel will pull through and save the situation, though it never will be any use afterwards."

"Some camels did extraordinary marches without water, Somali as much as eighteen days, and Indians nine days, but they never recovered. A camel if once allowed to get below par recovers very, very slowly."

"A great deal of nonsense was talked about the best way to prepare animals for trekking in Somaliland, some people insisting that it was fatal to give ponies and Somali camels any grain, as it only created an artificial appetite and thirst which could not be satisfied on the march, and therefore the animals would die, though those previously grass-fed only would do the work and live. This is quite a mistake. The ordinary rules for getting animals fit hold good in Somaliland, with the exception that it is undoubtedly sound, owing to the exigencies of the country, to teach animals to drink much and seldom rather than little and often."

"That Somali camels do very well on a regular ration of grain, dry grass, and water was proved by the camels in the carts. Each camel got 6 lb of grain and 15 lb of grass daily, and water every third day. They did steady work and kept, and some even improved, in condition."

I have specially quoted the above remarks as they not only show merit of animals but an intelligent handling of them.

I close this chapter with a strong wish that the few remarks I could crowd into a short article will induce officers and men to take a special interest in our Army camels, their selection,

their suitability for Army Service, their care, reduction of inefficiency by enlightened management, and last, but not least, the scientific elucidation of the peculiar diseases to which camel kind is heir, and which are imperfectly understood.

And may good luck always attend him in peace and war.

Chapter XII—ELEPHANTS.

From very early times elephants have taken part in war. They were not only used to stampede Cavalry and to trample down Infantry, but they were fighting machines, protected by armour, with steel blades fastened to their tusks, and saddled with towers or howdahs containing several men from which missiles of various kinds could be thrown. On occasion the elephants of rival forces would have a duel *à la mort*, the rest of the forces halting to contemplate the contest.

Perhaps the first appearance of elephants in historical battle was at the Battle of Arbela in 331 B.C., when Darius Codomannus marshalled fifteen elephants in his fighting line against Alexander the Great. No mention is made of the part they played on that occasion, but from that time onward their importance was considerable.

In 326 B.C. when Alexander the Great reached the River Jhelum (Hydaspes) he was opposed by King Porus. In the battle which ensued in the immediate neighbourhood of Chillianwala, King Porus, trusting to the terror inspired by his elephants, disposed them to the number of 200 in the front line, a hundred paces apart, his infantry being behind and his cavalry and chariots being on the flanks. Seeing the elephants, Alexander decided not to make a frontal attack, but relying on his superiority in cavalry he made his main attack against the left flank of Porus, one Brigade working to the rear. The result of this was that the Indian Cavalry were driven to shelter behind the elephants. The Macedonian phalanx then advanced, and as elephants crashed through it the situation was for a while serious. The Indian troops were, however, gradually hemmed in, the elephants as the battle progressed became

unmanageable from their wounds and attacked friend and foe indiscriminately. At last they refused to charge any longer. The Indian troops were defeated with heavy losses, and King Porus, who fought most bravely from a huge elephant until the very end, sought refuge in flight—to be captured shortly after. I have alluded to this battle specially, as it is perhaps the most glorious encounter in which elephants participated. They were certainly not relished by Alexander's troops, for in the complaints by the latter of war weariness and that they had gone far enough, they stated that towards the East there were still more powerful monarchs than Porus whose war elephants and armies were stronger and more numerous than his.

At the battle of Ipsus in Asia Minor in 301 B.C. Seleucus, a great soldier and one of Alexander's Generals, was said to have used his elephants (480 in number) with great effect against Demetrius, He obtained the elephants and large sums of money from Chandragupta of Indian fame in exchange for territory and the matrimonial alliance of his daughter.

The elephants of Antiochus Soter, a successor of Seleucus, in 280 B.C., caused a mad stampede amongst the Cavalry of the Gauls (said to have numbered 40,000) who had overrun Northern Asia Minor and settled in Phrygia. Antiochus celebrated the victory by a trophy bearing the figure of an elephant. In all probability they were Chandragupta's elephants. I mention this as of interest to India, elephants being long-lived animals. They are remounts at 40 and 50 years, and perform useful work up to 80 and 100 years.

Later on, at the Battle of Raphia in Palestine, in 217 B.C., there was an encounter between Indian elephants of Antiochus the Great and African elephants of Ptolemy of Egypt in which the Indian elephants prevailed, although the battle was lost to Antiochus.

The Macedonians at the siege of Megalopolis attacked with elephants, but the defenders strewed the ground with long spikes concealed under loose earth, and the huge animals maddened with pain, broke back, killing their own troops.

In the First Punic War the Carthaginian Army used elephants before Palermo. The Romans struck terror into them by means of flaming arrows and fireworks. They were

VIEW OF A PORTION OF NO. 26 FIELD VETERINARY HOSPITAL (CAMELS) AT DERA ISMAIL KHAN, SHOWING AVAILABLE TREES FOR SHADE.

put to flight, trampled down their own infantry, and the Romans taking the offensive gained a victory.

The Carthaginians were fond of elephants for War purposes.

The great Hannibal took 200 to Spain, and afterwards 37 of them crossed the Alps with him into Italy (219 B.C.) They were ferried across the River Rhone on rafts specially constructed. What with exposure and attack from the Roman Legions in the Battle of Trebia, only one remained. Hannibal obtained 40 remounts, but only seven remained to take part in his final overthrow on Italian soil.

At the Battle of Zama in Africa four years after, his elephants (80) were defeated by the Romans. Romans, as a rule, disliked encounter with elephants, but on this occasion a fine example of personal combat was set by the Roman Commander Scipio which ended in the destruction of nearly all the elephants.

The Parthians being essentially an Army of light Cavalry had no use for elephants: while under the Sasanian Dynasty of Persia the Corps of Elephants was the most important of the main Arms of Service.

In 1399 when Timur invaded India, he engaged the Army of Mahmud Nassir-ud-din at Ferozabad near Delhi. The Army of the latter included elephants armed to the teeth. Timur gained a victory by driving a herd of buffaloes with burning faggots attached to their horns amongst the elephants, causing them to stampede, with a resulting discomfiture and defeat of the Indian Troops.

At the siege of Arcot in 1752 Chanda Sahib had war elephants with iron plates on their heads, which were trained to butt against the gates and break them down. When fired on they turned tail, and created disaster amongst their own troops.

The foregoing will show that elephants have little merit as fighting machines, and that they even constitute a danger to the side to which they belong.

The last appearance of elephants in battle was in the Afghan War of 1878-80, and they finally disappeared as Field Transport after the Chin-Lushai Operations in 1890. In Afghanistan they were employed in Heavy Batteries, each gun being drawn by two elephants, the total number on the establishment of a Heavy Battery being six. They performed great service at the

Battle of Peiwar Kotal (2nd December 1878) packing four Horse Artillery guns up the steep ascent of the Kotal during the night, leading to the surprise of the enemy. Their immense strength, their silent movements, and aptitude for climbing over rough ground were of especial value for this purpose.

The drawback to elephants in Heavy Artillery is that they are very gun shy, and it was for this reason, and the difficulty of providing them with their enormous rations, that they lost their place as War animals. A big animal of this kind is also a fine mark for the enemy, and when one is knocked out or rendered ineffective it is relatively a serious loss of animal power to its unit.

Elephants in heavy batteries continued for some fifteen years after the Afghan War, and I recall those of a Battery, and their stable (still in existence) at Jansi, of which I had charge nearly thirty years ago. I remember, too, the old joke against the Veterinary Officer—that when his elephant patient required an enema, application had to be made for the local fire-engine.

As transport in the Chin-Lushai Expedition, the 70 animals employed proved most valuable, and performed very excellent work.

The only association the Army of India now has with the elephant is the scale of diet still permitted to be retained in Army Transport Tables. *Sic transit gloria mundi.*

PART V.

Economy to be Effected in the Disposal of Animals Wasted by War.

"And there was taken up of fragments that remained to them twelve baskets." (*St. Luke IX.* 17.)

"and they did all eat and were filled: and they took up of the broken *meat* that was left seven baskets full." (*St. Matthew XV.* 37.)

CHAPTER I.—GENERAL.

When a War costs from £5,000,000 to £6,000,000 per day, is continued for months and years, and income tax is subjected to continual rise, our thoughts are naturally driven to measures of economy.

War in all its aspects must necessarily mean extensive provision of material, and such provision must bear a considerable margin over demand and ordinary expenditure, to admit of unusual or unforeseen wastage.

On the other hand, a plethora of any thing may lead to wanton waste.

In any case, whether expenditure in war material is ordinary or extraordinary, there are fragments which remain to be picked up and turned to credit account. In previous sections I have remarked on business propositions of the Army, and ECONOMY, well directed, is certainly one of them. It is remarkable, and I think greatly to the credit of our Armies in the various theatres of the late Great War, what astounding results have been achieved by SALVAGE, under an organisation

which was simple during the progress of the War, and which at the end was most efficient in the methods of clearing up. Salvage, both during the War and after the conclusion of hostilities, represented one of the biggest Firms of Commercial Exploitation that has ever existed, for all Services, units, and men belonged to it, and it was headed by a controller. "What have you salved to-day?" asked the tail board of the motor wagon, and so forcibly and expertly was Salvage and Economy brought home to one and all, that "Baskets," manifold in design and degree of capacity, were filled to overflowing. I am sure that the Firm has every reason to be proud of its turn-over, and of its gross and nett profits.

One of the items of Salvage, and one of very considerable dimensions on demobilisation, related to the disposal of animals, and it is to that portion of disposal which is specially referable to the Wastage or unfitness of animals occasioned by the hard usages of war that I wish to devote the present section.

I regret exceedingly, and I am sure it is a matter of pain to many of those who have the interests of animals at heart, that those creatures who in dumb obedience shared the dangers and hardships of campaign with human beings should suffer the indignity of classification under Salvage; still it must be remembered that they are also creatures of mart—to be bought and sold, and they represent a considerable factor in a country's commercial enterprise. It may be taken, however, that their inclusion in Salvage only related to Returns. Their actual disposal was a thing of itself, very carefully considered—and quite rightly so, and I am in a position to affirm that humane thought and fellow-feeling reigned supreme in their disposal, even though the best economic considerations were necessary.

In war, where ineffective animals are sent to Field Veterinary units for evacuation to Veterinary Hospitals and Convalescent Horse Depots, it will be readily understood that the bulk of animals which are of no further use for military purposes, or the success of whose treatment is only problematical or economically unsound, will be found in these Institutions. Veterinary Service, therefore, becomes the chief medium through which the account, or military career, of an animal is closed and disposal effected.

It will also be realised that the longer the war the greater the wear and tear, and the greater the number of unserviceable animals for casting and disposal.

All animals wasted by war must be accounted for, not only in respect to numbers, but as to money realised in their disposal, and although this to the uninitiated may sound an impossible or hopeless undertaking, with proper and efficient organisation it becomes a comparatively simple routine process. This, at all events, was so in the British Expeditionary Force, France; and as disposal in that Force reached a magnitude which probably will never again be experienced, and as exceptional facilities existed, the procedure there followed may be taken as an example not only of the manner in which disposal is effected, but as to the profits, and the economy which can be made applicable to it.

In describing the process I shall endeavour, as faithfully as I can, to depict the history of animals after their being considered "unfit for further military service," which is the official phrase, and will group my remarks under the several headings,

CASTING.

DISPOSAL: (i) For work in civil pursuits, *e.g.* Agriculture. (ii) For food. (iii) For By-products.

ACCOUNTING AND AMOUNTS REALISED.

DISPOSAL ON DEMOBILIZATION.

I only ask that readers will not mark down Veterinary Service and myself as butchers, instead of a community of experts whose mission it is to cure and not to kill. I can safely say that the act of destruction is distasteful to the Veterinary Officer, but some one of his Corps must do the deed, and the responsibility for the execution of it in a proper and humane manner devolves on the Veterinary Officer.

Chapter II—CASTING.

Apart from animals which are incurably injured or diseased and which are destroyed as necessary under the orders of the Director of Veterinary Services or his representatives in Formations, the first step in the disposal of animals wasted by War is that they are cast by competent authority as unfit for further military service. No casting, or at least final casting, was done at the front; the principle being that only effective animals were maintained with fighting formations, the ineffectives being evacuated to Lines of Communication. It was, however, left to the Administrative Officers of Formations to recommend the casting of certain animals—from their more intimate knowledge of them, and this was indicated on the Evacuation Rolls for action.

The Casting Authority was, therefore, the Inspector-General of Communications, or the General Officer Commanding Lines of Communications, as he was subsequently termed. Acting under this Authority, the decision of casting was carried out by the Director of Remounts for what are designated Remount cases *i.e.* animals too old for further service or those subject to vice, and by the Director of Veterinary Services or his Deputies on Lines of Communications for those suffering from infirmity or disease. All animals submitted for casting were duly entered on Casting rolls, which were signed by the Director or his Deputy concerned. Furthermore, they were shown on the Forage and Animal Monthly Return of the Hospital or Depot, and struck off charge when disposed of, so that check was accurate. It was not practicable during active warfare for units of fighting formations, *i.e.* above railhead, to maintain a Forage and Animal Account. The check on casualties—deaths, destructions, missing, and evacuations, is quite enough to impose on fighting units, and casting and disposal are much better carried out farther back, where better facilities and a better market can be arranged.

It will be readily imagined that the wastage of War chiefly relates to veterinary disability, and only those, who have seen it in concrete form, can have any conception of what it means. I endeavoured to illustrate it in my previous paper on "Wastage of Animals in War." Arrangements therefore, for disposal in its varied forms were taken up by Veterinary Service, quite automatically as it were, and as the Force increased, and War became more intense and prolonged, a Disposal of Animals Branch of the Veterinary Directorate was instituted to meet the necessity for the co-ordination of the various channels of disposal, the framing of contracts for the sale of animals for purposes of food, the installation of machinery for the abstraction of by-products, and for the due accounting of the same. The misfits, the vice cases, and the ancients from Remount Service were transferred to this organization for disposal. The latter were comparatively few, for a Remount Service in War has no place for anything but efficient animals. Veterinary Service in France was fortunate in securing the services of a young officer for charge of the Disposal Section who not only was an expert in the necessary machinery for By-products, but a Chartered Accountant as well.

Chapter III.

DISPOSAL FOR WORK.

There was very little disposal at first in France except of animals died and destroyed. It was not until the beginning of November 1914 that definite casting rules were published in Routine Orders. The Indian Mounted Troops on proceeding up-country left some very inferior animals at Marseilles. Many were unsuitable from a Remount point of view, and infirm. They were cast and sold; the worst were destroyed. I do not think it could have happened under a system other than Silladar. But in the early days of rapid mobilisation our Home Force was not altogether free from its Methuselahs and infants. I rather fancy that in some instances father had dropped out of the ranks and his place taken by a member of his family of questionably discreet years, or *vice versa*. It is wonderful how such things arrange themselves when the desire for combat or otherwise (particularly the otherwise) is concerned, and even more wonderful is the adroitness with which these warriors find out Veterinary Hospitals and the reputed comfort thereof.

On the publication of Casting Rules, sales were held at the Base, Advanced Base, and at Paris. After a while these were stopped by order of the Army Council in deference to public opinion at Home, and instructions were issued that all cast animals were to be destroyed. From an economic point of view this made little difference, as it was possible to obtain almost as good an average price for purposes of food as for work. But the destruction of really useful life has very little to commend it, indeed it is sheer waste; and moreover, in spite of all argument which can be brought forward to the contrary, sentimental or otherwise, an animal, useful still in certain spheres, has just as much right to live as the man or woman who advocates or clamours for his destruction to remove him from any danger of cruelty.

The French Ministry of Agriculture was much perturbed at the order for destruction of horses, as they depended on us to

help them out in their replacements in districts of horses requisitioned for military purposes. Subsequent events showed how necessary this was, and how correct the view of the French Ministers of War and Agriculture. So great was the drain on their own resources in France that by November 1917 not only had 1,188,539 animals been bought in America and Spain to supply wastage (Journal of Royal United Service Institution, May 1919), but for rehabilitation at the end of hostilities they took as many animals as we could dispose of, and could have taken many more,

However, on the representation of the French Government the order for destruction was rescinded in favour of sale of suitable animals to agriculturists and breeders at the rate of not more than two animals per person, the *bona fides* of each person being certified by Mayors of Communes. This continued until the cessation of hostilities when, of course, very serviceable and good animals were put on the market under the measures of demobilisation.

The average price of cast horses and mules taken together sold to Farmers and Breeders during hostilities worked out at about £22 per head. A statement of the turn-over will be given later on in the section.

Chapter IV.

DISPOSAL FOR FOOD.

Excepting for dogs and cats, the flesh of horses in England was not used as food previous to the War. On the Continent it is different. In France, Belgium, and Germany it is quite commonly eaten, both in the form of sausages and as prime cuts. The law demands that it should be sold as horse flesh, and the shops are all distinctively designated, e.g., *Boucherie Chevaline.* In Paris there is a special and well ordered *Abattoir Hippophagique*, with cubicles for slaughter and dressing of the carcases and stabling for about three hundred animals. This abattoir was our principal centre for the

disposal of animals for purposes of food. The President of the Institution was our chief contractor and he was also the President of the *Chevaline Industrie de Paris.* Animals were sent by truck-loads from the various Veterinary Hospitals and Convalescent Horse Depots, accompanied by personnel of the R.A.V.C. They were met at the different Railway Stations of Paris by the Contractor's men and taken to the Abattoir under the supervision of a Non-Commissioned Officer of the R.A.V.C. They were weighed at the Abattoir, and were sold live weight at 1 Franc per kilo. for thin animals (Class B) and Fr. 1·50 per kilo. for those in good condition (Class A). Thin animals were used for sausages, the stouter ones for joints. Transactions were all cash, and the money was paid into the local Treasury Office. Regular Contracts were drawn out, and deposits were lodged by the Contractors in the Office of the Command Paymaster. So extensive did the transactions become as the War progressed—the number of animals running up to 600 and over per week, that for the personal safety of the young officer detailed to collect the money, payment was permitted to be made by cheque. A small Detachment of Royal Army Veterinary Corps, consisting of an Officer, a Sergeant, and a Corporal as accountant clerk, was maintained in Paris to watch our interests and those of the animals. The adaptability of the British Officer to business pursuits was well illustrated in the young officer, who was an Oxford Graduate and a Professor of French in a Colonial University previous to the War. What he did not know about this particular line of business, both wholesale and retail, after several years experience, was not worth knowing.

The average weight of a Class A (good condition) animal was about 450 kilos. so that the proceeds would be 450 x Fr. 1·50 = Fr. 675. The Class B animal (Debility and poor condition) weighed about 300 or 350 kilos. so that at Fr. 1 per kilo. the sum of Fr. 300 to Fr. 350 would be realized. Contractors were wholesale dealers and supplied retail shops. All carcases were passed by Municipal Meat Inspectors, and in the selection or submission of animals for purposes of food, Officers of the R.A.V.C. concerned were strictly charged that no animals were to be submitted but what were perfectly suitable, and in this

respect they acted in the *rôle* of Meat Inspectors themselves. Any animals that did not come up to the desired standard were disposed of for by-products.

Perhaps it will be interesting to readers, and illustrative of the greater use which is made of horse flesh on the Continent than in the British Isles, if I enumerate the trade terms and prices which ruled in Paris in the Spring of 1918. Briefly these were as follows:—

	Wholesale.		Retail.
Filet (4 to 5 kilos. only)	per kilo.	Fr. 3·50	Fr. 7·00
Tranches (principal cuts, about 90 kilos.)	,,	2·60	4·50
Gros Bout (brisket)	,,	2·60	3·00
Jambes	,,	1·60	1·60
Nerveux (low legs)	,,	2·00	2·40
Abats (Tongue, Heart, Liver)	,,	1·00	2·40
Cervelle (Brain)	,,	1·25	—
Collier (20 kilos.)	,,	2·00	2·40
Basse Viande (Scrap) 50 kilos.	,,	2·00	2·40
Saucisson (ordinaire, fresh)	,,	2·00	3·40
,, (Sec)	,,	4·00	6·00
Rognures (Cats' meat)	,,	·50	·60

28,384 animals were sent to the Paris Abattoir for purposes of food during the War up to the Armistice, and the average price realised was £12 16 0: after the Armistice up to the 31st March 1919, 8664 were sent, and as they were a better class, on demobilisation, the average price was £18 10 0.

In addition to the Paris custom, a large number were disposed of to local vendors at towns in which Veterinary Hospitals were situated — Havre, Rouen, Forges-les-Eaux, Abbeville, Boulogne, Calais, and St. Omer, 16,578 were thus sold previous to the Armistice at an average price of close on £14, while after the Armistice, up to the 31st March 1919, 20,679 were similarly disposed of at an average price of a little over £20. The latter included animals classed for destruction on demobilisation, and disposed of in areas occupied by our Armies, a great boon to the population and refugees returning to those areas. It also included the cast horses of the Army of

the Rhine, as animals were not permitted to be sold in that region excepting for food.

In every case the same procedure of destruction in the presence of a Veterinary Officer, the guarantee of suitability for food, and the accounting was followed.

The Disposal of Animals' Branch also maintained Butchery Detachments at the Abattoirs of Abbeville and Boulogne, and dressed carcases for Paris or local consumption and for delivery to the Army Service Corps for Coloured Labour Companies and Prisoners of War. These two small detachments previous to the Armistice dressed 4536 carcases, and 3903 afterwards, roughly at a turn-over of £20 per carcase. For a very long time, even though it represented a reduction of the import of foodstuffs, our Home Government would not consent to the issue of horse-beef as a ration to Prisoners of War, but to the evident appreciation of the prisoners, who were quite well aware of its good sound clean quality, issue was eventually permitted, and about 240 animals per week were dressed by our Butchery Detachments for this purpose. Our own men were also partial to certain delicacies, and several formal requests for liver, heart, tongue, etc., having been received, General Headquarters ruled that such might be issued as a free extra if demanded. Imagine liver and bacon, stuffed heart, boiled or pickled tongue, and brain fritters for breakfast !

The total amount realised in France, Belgium, and the Rhine Provinces in the disposal of animals for food up to the end of March 1919 reached the colossal sum of £1,313,323.

Chapter V.

DISPOSAL FOR BY-PRODUCTS.

In the first few months of the War a certain amount of difficulty was experienced in the disposal of dead animals. Horse slaughterers, owing to mobilisation or requisition of their horses, were difficult to procure, and either a charge for removal was demanded or no payment for the carcase could be obtained. Later on, fifteen francs per carcase was obtainable, the Contractor creating a dump and a powerful smell at the same time. At a still later period, when casualties were very heavy, the veterinary personnel of Hospitals and in Army areas, whenever possible, undertook the flaying of carcases, the hides being salted and the remains buried in pits. There are now some very valuable animal pits in France the contents of which will represent considerable wealth to the owner in manure specially suitable for vineyards.

At last, however, perfection was reached in the matter of disposal both from a hygienic and economic point of view. Machinery was obtained for the rendering down of carcases, and the average yield per carcase so treated amounted to about £4 0 0:—

Hide	£1	0	0
Flesh (dried)	1	9	3
Fat	1	5	0
Bones and hoofs		5	0
Hair			9
	£4	0	0

Seven installations were arranged on Lines of Communications, each with a personnel of fourteen men and capable of dealing with thirty carcases daily if necessary or as the situation demanded. These installations were termed "Horse Carcase Economisers" and were numbered serially as self-contained units. Four functioned at high pressure, and in view of final disposal on demobilisation it was thought that

certain of them would have to be duplicated, but the demand for animals for repatriation and for purposes of food reduced the necessity for further "Economiser" arrangements.

The necessary plant consisted of :—

Skinning platforms (concrete).
Boiling Tanks (2) galvanised iron, 500-1000 gallons, for bones, entrails, etc.
Boiler for Steam.
Small petrol engine for driving machinery.
"I.W.E.L." dryer, steam pressure, for desiccating flesh.
Turbine Fat Extractor (750 revolutions per minute).
Revolving meat cutter.
Bone crusher.
Skin Curing room (cemented floors).
Store room for desiccated flesh, oil drums, etc.
Office.
Extras, *i.e.*, Decauville line and trucks to manure dump.

The total cost of an installation was from £1000 to £1200, but the special machinery—the Dryers, Turbine Fat Extractors, Meat Cutters, and Bone Crushers, were presented by the Royal Society for the prevention of Cruelty to Animals at a cost of £500 each set.

There was no difficulty in getting expert skinners, and Prisoners of War assisted.

Arrangements were made to screen off the skinning platforms as much as possible from the chamber in which animals were destroyed, or where working teams of horses visited.

Hides, after being cured, were bundled and sent to England. Between September 1916 and March 1919, 36,877 hides were despatched.

Carcases would yield from 3 to 5 gallons of oil. It realized 13 francs per gallon in Paris for soap manufacture.

An average carcase would yield one hundred-weight of desiccated flesh, and it was sold in London for £31 per ton for pig and poultry food, or for dog biscuits. It keeps perfectly good and fresh for a long time, and there is no unpleasant smell.

Bones, after boiling, were crushed and de-greased in the Turbine Extractor and shipped to London, realizing there from £7 to £15 per ton.

Hoofs were sold to a Paris Contractor at Fr. 32 per 100 kilos.

Hair was taken over by the Railway Operating Division, for piston packing.

Blood was desiccated, and at the Abattoir at Boulogne a certain amount was taken over by the Royal Air Force for the manufacture of "Stickit" for Aeroplane wings.

By special arrangement, the Inspector Q.M.G. Services (Messing and Economies) used the Turbine Fat Extractors for the Extraction of Beef and Mutton fat from the swill of units wherever an Economiser was installed. His profits from Fats must have been enormous; the dried product of the swill was mixed with the desiccated flesh.

13,670 carcases were handled by the Horse Carcase Economisers up to 31st March 1919, and the gross takings amounted to £55050. Profits would have been greater if Economisers could have been installed earlier, but it will be realized that the very essential munitions of War take a much more prominent place in the priority of import. However, when duly installed they produced excellent results, and they were certainly very hygienic, and quite free from the putrid or unpleasant smell which may attend a wet process of disposal.

It was not practicable to adopt Horse Carcase Economisers in Army Areas to deal with animals died and killed. The utmost that could be done was to flay the died and destroyed and send the hides to Line of Communication for curing. The hides of wounded animals were of little value, hardly repaying the trouble or cost of flaying.

No serious Contagious Disease cases were included even in this method of disposal.

Chapter VI.

ACCOUNTING, AND AMOUNTS REALIZED.

All animals cast and sold to Agriculturists, or cast and disposed of for purposes of Food, were struck off charge on voucher, the casting roll in triplicate being used and accompanying the animals for this purpose. The proceeds of sale having been filled in against each animal and an endorsement of receipt of the money entered by the Field Cashier, the rolls were returned to the unit concerned, whether Remount or Veterinary unit. One voucher was used to support the monthly Forage and Animal Account which was submitted to the Financial Adviser for scrutiny and check, the second copy was retained by the unit for record, and the third was sent to the Director of Veterinary Services at General Headquarters, to enable him to make out his financial statement for inclusion in the Controller of Salvage General Return, and for audit.

Those animals died and destroyed as unfit for food and sent to Horse Carcase Economisers were struck off on ordinary voucher bearing receipt from the Officer in charge of the latter, a copy of such voucher again supporting the Monthly Forage and Animal Account submitted to the Financial Adviser.

The adjustment of the accounts for the sale of various articles of By-products was carried out in the Disposal of Animals Branch of Veterinary Directorate, in consultation with the Controller of Salvage. The Government at Home having control of all hides, notification of receipt and a somewhat complicated trade classification only was received, and an arbitrary value was fixed by us for purposes of account. Other articles were cash transactions under contract, excepting hair, which was a paper adjustment with the Railway Operating Department based on the market value.

TABLE A.

Detail.	Number of animals.	Approximate am't realised.
Sold by auction to Farmers and Breeders	7,775	£168,868
Sold to Paris Horse Butchers	28,384	364,438
Sold to Local Horse Butchers	16,578	231,621
Dealt with by Butchery Detachments and sold as dressed carcases	3,552	44,106
Dealt with by Butchery Detachments and issued to Labour Companies or Prisoners of War	984	21,100
Dealt with in Horse Carcase Economiser Plants for conversion into By-products	7,061	28,244
Total	64,334	£858,377

TABLE B.

Detail.	Number of animals.	Approximate am't realised
Sold by auction to Farmers and Breeders	112,132	£3,778,907
Sold to Paris Horse Butchers	8,664	160,474
Sold to Local Horse Butchers	20,679	414,919
Dealt with by Butchery Detachments and sold as dressed carcases.	—	—
Dealt with by Butchery Detachments and issued to Labour Companies or Prisoners of War	3,903	76,665
Dealt with in Horse Carcase Economiser Plants for conversion into By-products	6,699	26,796
Total	152,077	£4,457,761

The foregoing tables show the working of the Disposal of Animals Branch in two periods, Table A from its inception up to the cessation of hostilities, November 11th, 1919; and Table B during the period of Armistice and on demobilisation up to the 31st March, 1919. During the period covered by Table A the establishment of the Headquarters of the Disposal of Animals Branch consisted of one Officer, one Sergeant, and one Worker, W.A.A.C. During the second period, covered by Table B, when the work of check and accounting of animals sold in Army Areas on demobilisation was very heavy, the establishment was increased to two Officers and six other ranks, of which two were W.A.A.C. It cannot be said to be a very extravagant establishment in view of the amount of money involved.

Chapter VII.

DISPOSAL ON DEMOBILISATION.

I will close this section with a brief reference to the system pursued in the disposal of animals on demobilisation, and with a few statements, marked Appendices I, II and III, which will show the rate at which this was effected, and the proceeds of those disposed of in France and Belgium. The figures do not include the animals of the Canadian Corps who undertook the sale of their own, nor of the Portuguese Force who took the majority of their animals back to Portugal. No live animals were sold in Germany.

The principle followed was that all animals, whether with Formations, in Veterinary Hospitals and Convalescent Horse Depots, or in Remount Depots, were first examined by Boards of Veterinary Officers and classified by them into the following categories according to age, soundness or disability :—

A. Between 5 and 8 years and practically sound.
B. Between 8 and 12 years and practically sound.
C. Over 12 years or unsound.
D. Only fit for destruction for Food and By-products.

A, B, C, were re-classified by Remount Service into:—

X. For Post Bellum Army and Army of the Rhine—[the Best.

Y. For repatriation to England for sale.

Z. For sale on the Continent, including mules.

From a given date, fixed at 1st January, 1919, stock was taken of all animals on the strength of units. Forage and Animal Accounts were adopted by units in Army areas as well as those on Lines of Communication, so that check on disposal could be maintained. In transfers for purposes of sale or repatriation the peace Army Form O.1640, a very useful Form, and modified to suit the occasion, was used.

Category "D" (Destruction), animals were got rid of as soon as possible, and Veterinary Hospitals and Convalescent Horse Depots cleared with all speed, to hold animals demobilised.

By the first week in February it happened that men were being demobilised at a greater proportionate rate than animals, and a sale in bulk of 50,000 to Belgium having proved a failure through slowness of take over, it was decided that Armies should arrange sales in their respective areas, using the Mobile Veterinary Sections of Divisions and Veterinary Evacuating Stations of Corps as Disposal and Accounting units, the Remount Service supplying the animals from their "Z" Category by local arrangements. The usual sales by Veterinary Service on Lines of Communication were extended considerably and again fed with "Z" Category animals from Remount Service, who at the same time progressed with the repatriation of their "Y" Category horses to England up to approximately 62,000. So rapid was the disposal by sale that it was necessary to cry a halt at the beginning of April lest it was over-done. The machinery of disposal had got into such good working order, and demand for horses had become so great, that there would have been no difficulty in disposing of many more thousands at fairly good prices. "Heavy draughts" were keenly sought after, and prices from £100 up to nearly £200 were given in some instances. Sales by private treaty, and selection by Municipalities and Farmers' Associations were also arranged through Prefects, and these were appreciated as intending

purchasers—could have a good look at the animals beforehand and make their selections. The prices were arranged by a Committee of Officers. Every animal and its price was entered on the usual Casting Roll, and submitted through the Disposal of Animals Branch for audit. In a few weeks the whole of the accounts were passed by the Financial Adviser and the War Office, a most satisfactory ending to a no light undertaking.

The simple statements shown as appendices will be found interesting reading.

APPENDIX I.

BRITISH EXPEDITIONARY FORCE, FRANCE.

Disposal of Animals during February to July, 1919.

Week ending	Strength.	Died and destroy'd including Econo-misers.*	Disposal. Sale.	Horse Butchers	Add Remount Sales.	Total disposal.
Feb.						
6	326286	606	4177	2486	—	7269
13	312925	612	6238	2132	—	8982
20	292824	619	12963	2654	914	17150
27	260061	550	16791	3125	550	21016
Mar.						—54417
6	222917	457	20450	3185	1762	25854
13	193260	371	19896	2990	2224	25481
20	160935	308	17049	2889	1797	22043
27	135228	256	13680	2244	1585	17765
April						—91143
3	116678	205	7062	1248	1706	10221
10	47813	81	587	721	1337	2726
17	39833	111	1159	771	1258	3299
24	31866	47	4757	503	884	6191
May						—22437
1	26665	38	1758	265	847	2908
8	28432	31	1353	189	952	2525
15	27079	21	2061	139	—	2221
22	25790	22	1037	164	899	3122
29	23389	24	2308	108	599	3039
June						—13815
5	24088	21	1094	159	542	1816
12	22553	27	923	76	395	1421
19	24703	15	102	117	390	624
26	23063	21	4	98	400	523
July						— 4384
3	22866	8	485	95	397	985
10	21915	15	—	82	594	691
17	20169	20	957	64	596	1637
24	19933	19	—	72	359	450
31	20004	12	210	60	594	876
						— 4639
			Total Disposal		190835.	

* Horse Carcase Economisers, *i.e.*, Installations for reduction of carcases to By-products of skin, fat, desiccated flesh, hoofs, etc.

APPENDIX II.

BRITISH EXPEDITIONARY FORCE, FRANCE.

Summary of Completed Sales. Period from 11th November 1918 to 5th July 1919.

Week ending.	REMOUNT SERVICE. Amount realised during week.		REMOUNT SERVICE. Total realised from 11-11-18 to date.		VETERINARY SERVICE. Amount realised during week.		VETERINARY SERVICE. Total realised from 11-11-18 to date.	
	Francs	Cents	Francs	Cents	Francs	Cents	Francs	Cents
15th March, 1919	2,276,964	85	18,981,916	60	18,145,449	00	63,494,413	80
22nd ,,	2,301,572	00	21,283,488	60	12,921,042	00	76,415,455	80
29th ,,	1,856,589	50	23,140,078	10	18,833,362	00	95,248,827	80
5th April	2,102,121	90	25,242,200	00	16,525,353	80	111,774,171	60
12th ,,	1,590,330	00	26,832,530	00	8,764,815	75	120,538,987	35
19th ,,	1,546,642	00	28,379,172	00	5,127,887	05	125,666,874	40
26th ,,	1,047,450	00	29,426,622	00	2,135,863	40	127,802,737	80
3rd May	767,125	00	30,193,747	00	4,906,872	00	132,709,609	80
10th ,,	—		30,193,747	00	5,519,507	75	138,229,117	55
17th ,,	1,008,189	00	31,201,936	00	2,873,148	00	141,102,265	55
24th ,,	2,179,742	90	33,381,678	90	670,279	60	141,772,545	15
31st ,,	658,830	50	34,040,509	40	2,317,043	35	144,089,588	50
7th June	670,225	00	34,710,734	40	3,486,272	75	147,575,861	25
14th ,,	628,757	50	35,339,491	90	2,646,756	95	150,222,618	20
21st ,,	515,470	00	35,854,961	90	988,115	40	151,210,733	60
28th ,,	478,800	00	36,333,761	90	2,828,457	15	154,039,190	75
5th July	461,082	50	36,794,844	40	6,600	00	154,045,790	75

The above information extracted from weekly returns circulated by D.Q.M.G., British Troops in France and Flanders.

APPENDIX III.

ARMY VETERINARY SERVICE, FRANCE AND FLANDERS.

Amount realised by Sale of Animals in France and Belgium from 11th November, 1918, to 30th June, 1920.

	Gross amount realised in respect of sales of animals	Fees deducted at source by Auctioneer*	Nett amount credited to the Public
FRANCE:	Francs Cts.	Francs Cts.	Francs Cts.
Sold for Work - - -	139567058 · 75	6100651 · 65	133466407 · 10
for Food and By-products	15034846 · 50	—	15034846 50
Total	Fr. 154601905 · 25	6100651 · 65	148501253 · 60
BELGIUM:			
Sold for Work - -	24371087 · 00	668203 · 20	23702883 · 80
for Food and By-Products	2409690 · 15	—	2409690 · 15
Total	26780777 · 15	668203 · 20	26112573 · 95
Grand total	Fr. 181382682 · 40	6768854 · 85	174613827 · 55

The auctioneers' commission paid the advertising expenses and covered all charges on the sales of animals by the British Army.

Fees paid direct by Sales Officer—*nil.*

PART VI.

Extracts from Official Despatches.

I.—BRITISH ARMIES IN FRANCE.

By General Sir DOUGLAS HAIG, G.C.B., K.C.I.E., K.C.V.O., Commander-in-Chief, British Forces in France, dated 19th May, 1916.

"19. The large increases made to our Forces have necessitated a great expansion in the resources of our Lines of Communication, and I have been greatly struck by the forethought shown by the Administrative Services in anticipating the requirements of the Armies in the Field and in the provision made to satisfy these requirements."

* * * * *

"Economy has attended the good methods employed, and the greatest credit is due to all concerned for the results obtained."

By General Sir DOUGLAS HAIG, G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 23rd December, 1916.

"The Army Commanders have brought to my notice the excellent work done by their Staff Officers and Technical Advisers, as well as by the various Commanders and their Staffs serving under them, and I have already submitted the names of the various officers and others recommended by them."

"I desire also to record my obligation to my own Staff at General Headquarters and on Lines of Communication, and to the various Technical Advisers attached thereto, for their loyal and untiring assistance."

By Field Marshal Sir DOUGLAS HAIG, G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 31st May 1917.

"I desire also to repeat the well-merited tribute paid in my last Despatch to the different Administrative Services and Departments. The work entailed by the double task of meeting the requirements of our winter operations and preparing for our next offensive was very heavy, demanding unremitting labour and the closest attention to detail."

By Field Marshal Sir DOUGLAS HAIG, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 25th December, 1917.

"The work of the Army Veterinary Corps and of the Mobile Veterinary Sections has been ably carried out, and has contributed largely to the general efficiency of the Army."

* * * * *

"In the heavy and responsible work which they have so admirably performed, the Army Commanders have been most loyally supported and assisted by their Staff Officers and Technical Advisers, as well as by the Commanders and Staffs of the units serving under them . . . . as well as the other Officers of my Staff, and Technical Advisers at General Headquarters and on Lines of Communication, have given me the greatest and most valuable assistance. I am glad once more to place on record the debt that I owe to them."

By Field Marshal Sir DOUGLAS HAIG, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 20th July, 1918.

(*The Great German Offensive*).

"The enormous amount of additional work thrown upon the different branches of my Staff and upon the Administrative Services and Departments by such fighting as that of March and April can readily be imagined. The evacuation of great masses of stores, hospitals . . . . called for the highest powers of organisation, the most constant forethought and supervision, and the most devoted labour. That all this work was carried out so smoothly and successfully under circumstances of extraordinary difficulty . . . . reflects the highest credit on all concerned."

* * * * *

"I wish to thank the heads of the various Branches of the Staff and of Departments and Services for the essential share that they and their subordinates have taken in preventing the realisation of the enemy's plans."

By Field Marshal Sir DOUGLAS HAIG, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 21st December, 1918.

(*The Advance to Victory*).

"To all other Administrative Services and Departments, I desire to express the thanks of the fighting forces for the loyal and efficient manner in which they have carried out their essential tasks. During a period of great strain and incessant work they have contributed in their various spheres to the smooth working of the Army machine and are entitled to the full share in the victory of our Arms."

By Field Marshal Sir DOUGLAS HAIG, K.T., G.C.B., G.C.V.O., K.C.I.E., Commander-in-Chief, British Armies in France, dated 21st March, 1919.

(*Final Despatch.*)

"The Veterinary Directorate reduced losses and prevented the spread of disease."

II.—MESOPOTAMIAN EXPEDITIONARY FORCE.

By Lieut.-General Sir STANLEY MAUDE, K.C.B., C.M.G., D.S.O., Commander-in-Chief, Mesopotamian Expeditionary Force, dated 10th April, 1917.

"Sickness and battle casualties have placed a strain upon the resources of the Veterinary Department which has been met by wise anticipation and considerable efficiency."

By Lieut.-General Sir STANLEY MAUDE, K.C.B., C.M.G., D,S.O., late Commander-in-Chief, Mesopotamian Expeditionary Force, dated 15th October, 1917.

"Similarly the valuable services rendered to this Army by the Directors and the Administrative Services and Departments were previously dealt with by me in detail. In their case there has been no partial respite from their labours such as has been enjoyed by fighting troops, for their work at the front, on the Lines of Communication, and at the Base has continued at the highest pressure. Reorganisation, development of our resources, and preparation for the future have needed careful thought and unrelaxed efforts on the part of all, and the progress made in these directions has been very gratifying. More than a passing word of recognition is therefore due to these individuals, who, in spite of the intense heat during the summer months, have continued to work so assiduously in the interests of the Army,"

By Lieut.-General Sir W. R. MARSHALL, K.C.B., K.C.S.I. Commander-in-Chief, Mesopotamian Expeditionary Force, dated 15th April, 1918.

"Owing to the increased area over which this Force operates, to the amount of animal diseases existing in the territories conquered, and to the constant danger of the animals of the Force being infected, it has been found necessary to increase the Veterinary Administrative Staff, and to form extra Veterinary Hospitals. The results are most gratifying, and reflect great credit on this Department."

By Lieut.-General Sir W. R. MARSHALL, K.C.B., K.C.S.I., Commander-in-Chief, Mesopotamian Expeditionary Force, dated 1st October, 1918.

"I have been throughout most ably and loyally served by my subordinate Commanders, Staff and Technical Advisers, and take this opportunity of recording my most sincere thanks for all their good work."

III.—BRITISH SALONIKA FORCE.

By Lieut.-General G. F. MILNE, C.B., D.S.O., Commander-in-Chief, British Salonika Force, dated 1st October, 1917.

"It is satisfactory to record that the wastage amongst the animals of the Force, in spite of the heavy strain during the winter, has been exceptionally low. The supply of all material to the troops necessitates the use of both wheeled and pack transport, while the tracks branching outward from the main routes, although in dry weather providing a good running surface, are, in the majority of cases, deep in mud after prolonged snow or rain. The calls on horse flesh have hence been severe, and it speaks well for the Army Veterinary Services that the mortality and loss through wastage has been kept to such a low figure."

By General Sir GEORGE F. MILNE, K.C.B., D.S.O., Commander-in-Chief, British Salonika Force, dated 1st December, 1918

"No very great strain has been placed on either the Royal Army Veterinary Corps, or the Remount Department, which have both proved equal to all demands made on them. The present uniformly good condition of the animals in the Force is largely due to the efforts of these two Services to improve and simplify animal management."

IV.—EGYPTIAN EXPEDITIONARY FORCE.

By General Sir ARCHIBALD MURRAY, G.C.M.G., K.C.B., late General Officer Commanding, Egyptian Expeditionary Force, dated 28th June, 1917.

"The same local conditions above referred to have rendered the Force more than usually dependent on animal transport, while operations have involved the use of important mounted forces. The Remount and Veterinary Services have consequently held a vital place in the organisation, and they have carried out their respective tasks to my complete satisfaction."

By General Sir E. E. H. ALLENBY, G.C.M.G., K.C.B., Commander-in-Chief, Egyptian Expeditionary Force. Third Despatch, dated 18th September, 1918.

"The fighting troops have been loyally assisted by the Administrative Services and Departments who have carried a heavy burden on their shoulders, both in front and behind railhead."

V.—EXPEDITIONARY FORCES IN INDIA.

By His Excellency General Sir CHARLES CARMICHAEL MONRO, G.C.B., G.C.S.I., G.C.M.G., Commander-in-Chief in India. On Operations during the *Third Afghan War* from May to August, 1919, dated 1st November, 1919.

"13. The requirements of Veterinary Service necessitated the formation of three Camel Veterinary Hospitals for 500 camels each, a Camel Convalescent Depot, and a Horse Convalescent Depot for 1000 animals each as well as additional Field and Mobile Veterinary Sections and Base Depots of Veterinary Stores. The creation of these units imposed a severe tax on available sources of recruitment and some difficulty was experienced in obtaining personnel of the right stamp. But on the whole the existing organisation stood the test well. The mortality among animals was never excessive, amounting to a weekly average of ·2 per cent. in the case of horses and ponies, ·04 per cent. in the case of mules, 3 per cent. in the case of bullocks, and ·3 per cent. in the case of camels, as compared with ·2, ·06, 1·6 and ·1 per cent. respectively during the period May to September 1918, in Mesopotamia. The evacuation of sick animals was on the whole well carried out, but there was a tendency to maintain too many ineffective animals with units; this fault was corrected in course of time. Considerable inefficiency was caused by the incidence of foot-and-mouth disease and rinderpest in bullocks.

"88. As already stated I have had every reason to be satisfied with the work of the Veterinary, Remounts, Ordnance, Supply and Transport Services."

Waziristan Operations, 1919-20.

By His Excellency General Sir CHARLES CARMICHAEL MONRO, G.C.B., G.C.S.I., G.C.M.G., Commander-in-Chief in India, dated 1st August, 1920.

"The work of the Veterinary Service was ably carried out. By foresight and close attention to detail, Directors and Officers of the Corps eliminated all possibility of a breakdown of the Transport Service from disease. Many of the Animal Transport Corps were without experienced Officers, and the Veterinary Service made up the deficiency by advice and constant inspection."