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The Indian Veterinary Journal.

(The Journal of The All-India Veterinary Association)



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NOTICE

The Indian Veterinary Journal

A quarterly record of Veterinary Medicine and Surgery
devoted to the cause of the Veterinary Profession.

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EDITOR:

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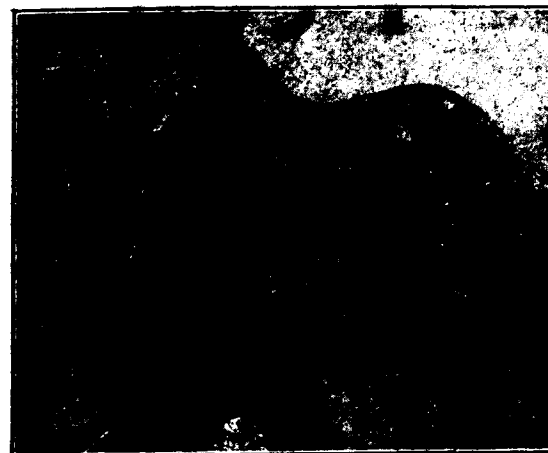
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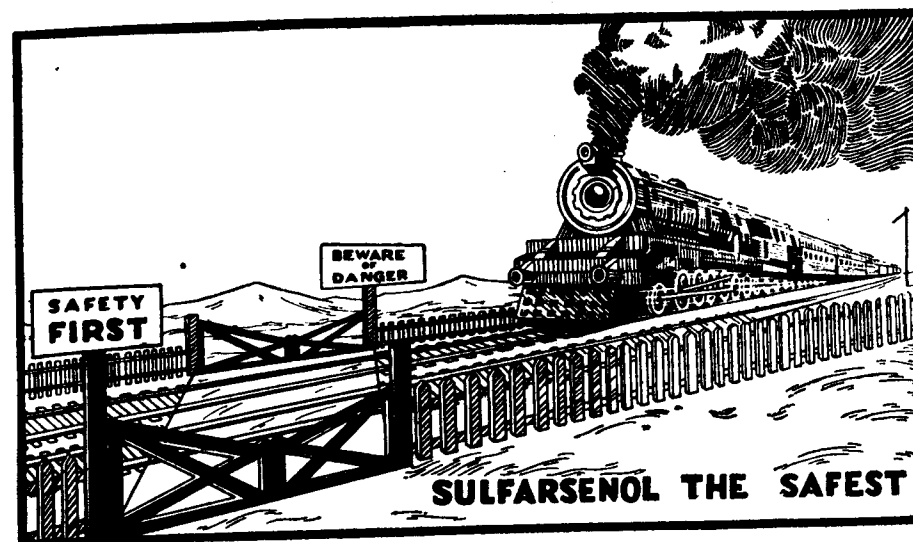
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THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)

Vol. VIII.]

OCTOBER, 1931.

[No. 2.]

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Captain S.G.M. Hickey, I.V.S., Director, Civil Veterinary Department, United Provinces, Patron of the U.P. Veterinary Association, who opened the 11th Veterinary Conference, on the 4th April 1931, at Lucknow.

THE Indian Veterinary Journal

Vol. VIII]

OCTOBER, 1931

[No. 2

Editorials

THE AGRICULTURAL RESEARCH COUNCIL.

The report of the above Council, as published in the Press, for the period from June 1929 to March 1930, makes an interesting reading. After dealing with what has been done on the agricultural side with regard to Sugarcane development, Locust Pest, Rice Research, etc., the report deplores the lack of similar expansion or development on the Animal Husbandry side of the Council's activities. Two reasons are set forth as contributing causes. They are of the usual quality and quantity type. "The Veterinary Departments in India are greatly undermanned" says the report. "Unless these departments are adequately staffed, both in regard to numbers and in the quality of their personnel, it is to be expected that suggestions for conducting research from the Provinces will be few and far between." We agree. Rightly has the Council placed the quantity before quality. As things are at present, the staff are unable to cope with the demand they have created for veterinary aid in India and their hands are more than full with the routine work. Where is the time for Research even in well equipped laboratories? Whereas every grain or millet that grows can claim the exclusive attention of particular specialists in the sister profession of Agriculture, it is distressing to find such facilities denied in our own department. The fault is not so much with the Government as with the heads of veterinary departments in several Presidencies and Provinces. Men of vision, of grit and determination, of push and go, of selfless love for the profession, of high devotion to science and of craving for rapid expansion as in the case of agricultural department, are needed in larger numbers.

It is a misfortune which has beset the path of veterinary progress in this country from its very inception. We have said this

before, times without number and we repeat it now that unless men at the helm of affairs shake off their nervousness, refuse to be goaded into inaction by an unimaginative Government, and strike out a bold line of action for an all-round expansion, the country will continue to groan under the present deplorable state of affairs. They should feel that their department is one of the most essential for the economic welfare of this vast country, and as such, one deserving the first attention of the Government. There is no good of viewing the department only as a humanitarian concern deserving of the crumbs from Government table whenever it suits them. More science, more life, more vital things are involved than that. More than the animals, science, man, country and the Government stand to gain. Government needs to be told straight and strong. If there is a paddy specialist, a millet specialist, a cotton specialist, a sugarcane expert, an oil seeds expert, etc., etc., why not an investigating and research officer for each one of the major epizootics of cattle? Was ever the proposal put forward with the force, nay, the solemnity it deserves? Can the Government be accused under such circumstances? Oh! The pity of it.

As for quality of available men, we beg to differ partially from the view point of the A.R.C. In some Provinces, at any rate, there are many workers with research bend of mind, who will compare very favourably with workers in other countries. With opportunities denied, with facilities unprovided and with too much of routine work on hand, they carry on their existence unrecognised, unhonoured and unsung. But we agree that an increased standard of general qualification and an improved curriculum in the veterinary colleges are essential and we have ourselves been fighting for it all these years.

Now that such serious defects have been pointed out by a recognised responsible body, let us hope that the several local Governments will pay some heed to these valuable suggestions. And we beg of the A. R. C., to insist on the immediate expansion of the veterinary departments in several Presidencies and Provinces and to start the very valuable proposal of creating "disease investigation staffs in the Provinces."

We feel the profession in India is pilloried for no fault of its own. It has been crying itself hoarse for its rights with no response whatever. But yet, let us not cease our efforts until success is ours. We hope that this article will be viewed in the spirit in which it has been written and not misunderstood.

SERUM-SIMULTANEOUS ANTI-RINDERPEST INOCULATION OF CATTLE.

We reproduce elsewhere from the Indian Journal of Veterinary Science and Animal Husbandry, the article entitled "Directions for the Serum-Simultaneous Anti-Rinderpest inoculation of Cattle" by Mr. Hugh Cooper, M.R.C.V.S., I.V.S., of the Muktesar Institute. Rinderpest and its control in this country form a very important part of the activities of the Civil Veterinary Department in the various provinces. But in the majority of the provinces, the Serum-Simultaneous method of inoculation against this disease, which is admittedly the most suitable of the measures for keeping this dreaded disease under check, has not made much headway. It is unnecessary for us to enter into the causes responsible for this state of affairs for the subject has received considerable attention in recent years. It is gratifying to see, however, that increased attention is being paid to tackle this question of Rinderpest control, in the Madras Presidency and in the Mysore State. Although Rinderpest has been with us from pre-historic times, our knowledge concerning the disease and its control is far from complete, and a good deal of sustained research work still remains to be done before we can hope to eradicate the disease from our midst. We propose to review briefly the subject matter of the article by Mr. Cooper with a view to elicit further information on some of the points. It is true that the technique employed in the Serum-Simultaneous method of inoculation has been modified from time to time in the light of further experience; but certain fundamental changes that have been introduced appear to us to be in need of further explanation as to their rationale. We refer to the use of goat-virus and serum of varying potency advocated for the immunisation of cattle. Under paragraph 13 of the article under reference, it is stated that "goat-virus has a somewhat 'fixed' or steady virulence usually considerably lower than that of virus direct from cattle and is therefore generally safer to use."

In the case of ox-virus, it is stated that hill bulls of high susceptibility are used for virus production. These two statements appear to us to be not wholly consistent. If a highly potent virus is necessary for the production of a lasting immunity following Serum-Simultaneous inoculation, then the use of a "fixed goat-virus" which, in other words, means a virus of a somewhat attenuated potency, would appear to be not consistent with the fundamental principles of immunology, unless the attenuation of the virus is such as to make it serve as a Vaccine, not requiring the simultaneous use of the anti-serum. The goat is less susceptible to rinderpest than even the indigenous cattle of the "plains", for in very many severe outbreaks of

the disease we have come across in South India the goats freely mixing with the diseased cattle, have usually escaped infection. It would be interesting to know if cattle, immunised by the Simultaneous method with goat-virus have withstood subsequent exposure to the disease in natural outbreaks. As regards the "cleansing" properties claimed for the goat-virus in respect of protozoon parasites, it is common knowledge that it is the latent piros and trypanosomes that complicate the reactions following S.S. inoculation in the vast majority of cases. The indigenous cattle have such a high tolerance that the accidental introduction of these protozoon parasites along with the ox-virus is not of any serious consequence.

Another item of considerable interest in this connection is the anti-rinderpest serum of varying potency issued for use from the Muktesar laboratory.

The class I serum is recommended for cattle of high susceptibility, the class II serum for indigenous cattle of the "plains" and class III serum for serum alone method of inoculation. We confess our ignorance in respect of the theory or principle on which the use of Serum of varying potency for a disease like Rinderpest is based. It is fairly well established that there is no difference in the severity of the attack, under identical conditions, whether the disease is naturally contracted or artificially induced. That being so, we do not see how it is possible to justify the use of serum of varying potency for the serum alone method and the S.S. method of inoculation. The class-III serum of lower potency recommended for the serum alone method is supposed to protect the animals exposed to natural infection, and yet this serum is said to be not potent enough for S.S. inoculation. Similarly, the class-III serum is not to be used for S.S. inoculation for animals of higher susceptibility than the cattle of the "plains". Surely, those engaged or interested in the work of Rinderpest prevention and control are entitled to know how this practice of issuing serum of varying potency is justified. And we look forward to be enlightened on these matters.

KHAN BAHADUR SHEIKH NIAZ MOHAMMAD SAHIB

The "Veterinary Magazine" our Anglo-Vernacular contemporary from United Provinces for July 1931, contains a short biographical note on Khan Bahadur Sheikh Niaz Mohammad Sahib. The name is so familiar to the Veterinary World in India that we do not feel the need for an elaborate introduction of that good and genial gentleman. Our contemporary has rightly observed that "to write the life sketch of Khan Bahadur Sahib would be to narrate the history of the Civil Veterinary Department, United Provinces."



Khan Bahadur Sheikh Niaz Mohammad, G.P.V.C., Superintendent Civil Veterinary Department, United Provinces, Allahabad, President of the 11th U.P. Veterinary Conference, held at Lucknow on the 4th & 5th April, 1931.

A gentleman of action, who spares neither himself nor others before the stern call of Duty, he has been a devoted servant of the Crown and the Profession for over quarter of a century now. From humble beginnings, he has arisen to the high office of the Superintendent, Civil Veterinary Department, United Provinces, by sheer force of his character and merit. Unlike many men of ambition, whose orbit of vision seems to begin and end with 'self' his noble heart never forgot the cause of his profession and he was instrumental in bringing into existence the oldest Veterinary Association in India. Even that provincial spirit was too narrow for his noble heart and he in collaboration with another great soul Mr. S. M. Raza Hussain Sahib, conceived of the idea of an All-India Veterinary Association and made it an accomplished fact. When the birth of this very organ was announced in the Bennet Hall of the Canning College at Lucknow, he came forward with the gracious offer of a typewriting machine for the journal, which was gratefully accepted: His help to his Provincial Association has been immense. Pulsating as he does with a burning desire for service to his profession and his country, he has been responsible a good deal for popularising the veterinary department in United Provinces. The Government have rightly raised him from a "Khan Sahib" to "Khan Bahadur" and we most solemnly join with our contemporary and we daresay with the entire profession in India in wishing him a long and prosperous life.

Original Articles.

A SCHEME FOR THE SYSTEMATIC EXAMINATION OF SECTIONS OF TISSUE.

BY

D. C. MATHESON F.R.C.V.S., D.V.S.M. (VICT.),
*Professor of Pathology and Bacteriology, Royal (Dick.)
Veterinary College, Edinburgh.*

The following questions were devised by the present writer to assist the student of Morbid Histology in the examination of sections of tissue :—

- (1) What is the tissue?
- (2) Is the tissue normal?
- (3) If the tissue be not normal of what does the abnormality consist?
 - (a) of an addition due to overgrowth of some or of all of the original constituents?

- (b) of a subtraction from any or from all of the original constituents?
- (c) of the addition of some foreign body, or substance, *e.g.*
- (1) Animal *e.g.* parasite.
 - (2) Vegetable *e.g.* bacterium.
 - (3) Organic substance, *e.g.* amyloid material.
 - (4) Inorganic substance *e.g.* certain salts.
- (d) of a disorderly arrangement of cells and/or of tissues which while recalling some of those of the body at some stage of its development; differ in their degrees of differentiation, in their incompleteness, and in their disorderly arrangement *e.g.*

- (1) Blastomata. (2) Teratomata.

The questions may be briefly reviewed.

- (1) *What is the tissue?*

Cells. Types. Size. Shape. Number. Arrangement. Contents?

Nuclei. ditto. Sign of division?

Intercellular substance?

Basement membrane?

Blood Vessels. Characters. Well formed or otherwise etc.?

Lymphatic vessels: spaces ditto?

Nerves; Nerve endings?

Ducts: lining cells. Contents etc.?

- (2) *Is the tissue normal?*

The section under examination should be compared with a preparation showing the normal histological characters of the tissue under examination.

The question serves also to remind the student of histology that his sections will be required in subsequent classes *e.g.*

- (1) Practical Pathology, Bacteriology, Meat Inspection and Protozoology.

- (2) Post-graduate classes as above.

The histological preparations should be carefully preserved for these purposes.

- (3) The third question explains itself.

DIRECTIONS FOR THE SERUM-SIMULTANEOUS ANTI-RINDERPEST INOCULATION OF CATTLE *

BY

HUGH COOPER, M.R.C.V.S., I.V.S.,

Veterinary Research Officer, Imperial Institute of Veterinary Research, Muktesar-Kumaun.

In order that the principles of the serum-simultaneous method of active immunisation of cattle against rinderpest should be readily available to veterinary workers and stock-owners in India, the circular instructions upon the method in use at that time were published in 1925 from the Imperial Institute of Veterinary Research, Muktesar, in the *Agricultural Journal of India* as one of a series of articles contributed to the Journal under the title "Some Recent Advances in the Protection of Cattle and Other Animals against Disease". [Edwards, 1925.]

Since that date the instructions have been considerably modified, and the greatest change occurred upon the introduction by Dr. J. T. Edwards, D. Sc., M. R. C. V. S., the late Director of the Institute, of virulent blood obtained from goats after "fixation" of the ox rinderpest virus by intra-uterine injection into pregnant goats [Edwards, 1927]. An addendum to the instructions dealing with the use of this new form of virus was also published in the *Agricultural Journal of India*, in 1928 [Edwards], but the issue of this first number of a journal devoted to the interests of veterinarians engaged upon work in connection with animal husbandry in India appears to be a suitable occasion for the publication again of the most recent edition of the same directions since they now incorporate a description of the use of both forms of virus.

The opportunity has been taken to publish with the directions a number of charts illustrating the several kinds of reactions that may occur in the course of virus production and immunisation by this method of inoculation, whilst a plate has been added illustrating the microscopical appearances of the three common species of parasitic organisms that may be responsible for complicating diseases described.

The directions have been drawn up with especial reference to the practical needs of the veterinary worker in the field, and no attempt has been made to discuss their theoretical implications or their bearing on the general principles of immunology.

* Reprinted from "The Indian Journal of Veterinary Science and Animal Husbandry" Vol. I. No. 1,

DIRECTIONS.*

1. THE SERUM-SIMULTANEOUS METHOD.

The operation is very simply carried out in practice. Cattle that are susceptible to rinderpest are inoculated subcutaneously with a certain dose of anti-rinderpest serum, estimated to be more than adequate to protect them against the development of an attack of the clinical disease, and, simultaneously, they are also injected with a small dose of virus, that is, virulent blood withdrawn from an animal at the height of an attack of rinderpest.

2. SELECTION OF ANIMALS FOR INOCULATION.

Animals that are very weak or debilitated from any cause, and cows in a very advanced state of pregnancy should not be inoculated.

Cattle of any age may be inoculated including calves as young as a few weeks old, provided they are in strong condition.

It is recommended that the operation should be carried out upon cattle as early as practicable after purchase, and in calves, as soon as they are six months old.

Cattle of two teeth and over usually require no further inoculation during their life-time, but animals immunised at less than this age should be submitted to a second immunisation after reaching it.

3. SEASON FOR INOCULATION.

Serum-simultaneous inoculation can safely be carried out at any season of the year. Ordinarily, however, it is preferable to select a cool dry season when animals are likely to be in the best possible condition.

During a natural outbreak of rinderpest in unprotected animals at any season of the year, it is sound practice and strongly to be recommended that this form of inoculation be used in preference to the serum-alone method. All in-contacts, not exhibiting fever or other visible signs of the disease, should then be inoculated.

It has been the practice hitherto in many places to brand each animal given serum-simultaneous inoculation. A large letter "O" has been branded with a hot iron upon one quarter. This practice is to be recommended as it provides a distinguishing mark between immunised and unprotected animals in a herd.

* NOTE 1.—The instructions embodied in the following pages also apply to buffaloes.

* NOTE 2.—When a number of days after injection is mentioned, these days are to be counted *excluding* the "zero day", that is, the day on which the injection is given.

4. SEGREGATION AND DISINFECTION MEASURES.

In natural circumstances rinderpest spreads to susceptible animals by direct contact with affected cattle in the early stages of the disease. Since animals undergoing serum-simultaneous inoculation must be considered infective for about a fortnight, the main precaution to adopt is to restrict movement of the inoculated animals.

If a segregation camp is well fenced, or if the inoculated animals remain constantly tied up and the camp is situated at least half a mile from sheds containing unprotected animals or a public highway, then precautions, other than the ordinary rules of disinfection, are unnecessary.

Inoculated animals should be under the care of special attendants who must not be allowed to come into contact with uninoculated animals. It is a good practice to keep a sufficient number of smocks at the entrance of all sheds or enclosures where the inoculated animals have been accommodated. These smocks are used by the attendants while they are at work with the animals, and are taken off and left at the entrance when they leave their work.

Shallow pails of disinfectant fluid should be placed at all entrances and in them all persons should dip their boots (or feet) both while entering or leaving. Arrangements should be made before immunisation is started for a sufficient supply of grain and fodder to be within the camp.

Excreta and soiled bedding must be considered infective, and measures should be taken for their disposal within the segregation camp.

5. SERUM FOR THE ACTIVE IMMUNISATION OF CATTLE AGAINST RINDERPEST.

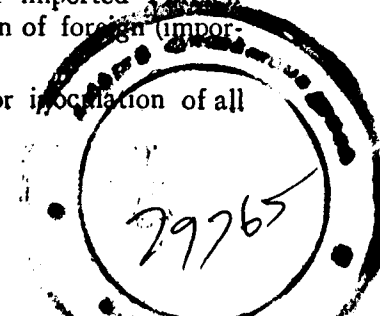
Serum required for inoculation by this method must be specially indented for from the laboratory a short time before the anticipated date of the inoculation and the request for the serum must be made *in the above precise terms*. Old stocks of serum that have remained over from a previous season must not be used. The serum for serum-simultaneous inoculation is issued in bottles with special white labels in two grades:—

Class 1 serum.—This serum is to be used for imported Foreign cattle and also animals containing any proportion of foreign (imported) blood.

Class II serum.—This serum is issued for inoculation of all Indian breeds of cattle and buffaloes.

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6. RECOMMENDED DOSE RATES OF SERUM.

The following table indicates approximately the quantities of serum in cubic centimetres for each hundred pounds body weight recommended for different breeds of animals :—

Breed.	Dose per 100 lbs. body weight.	Class of serum.
Imported Foreign cattle ...	45 to 50 c. c.	Class 1.
7/8th European breed ...	35 to 40 c. c.	
3/4th " " ...	30 to 35 c. c.	
1/2 " " ...	20 to 25 c. c.	
1/4th " " ...	15 to 20 c. c.	
1/8th " " ...	12 1/2 to 15 c. c.	
Indian breed cattle ...	5 to 10 c. c.	Class 11.
Buffaloes ...	10 to 15 c. c.	

The dose rate of serum indicated above for Indian breed cattle refers to "plains" animals in areas where rinderpest is indigenous. Cattle bred in hill districts require from 15 to 25 c.c. per 100 pounds. No animal, however small and of whatever breed, should be given less than 30 c.c. of serum.

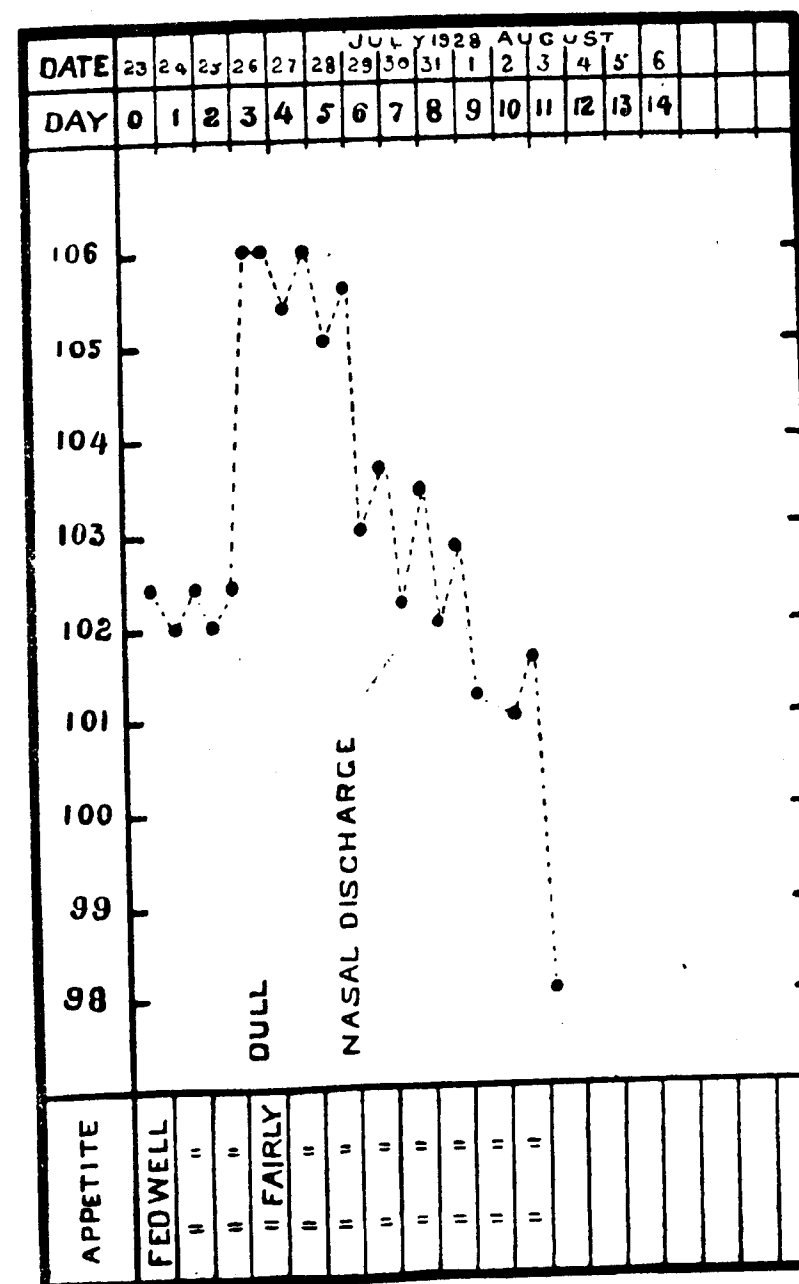
In the event of any uncertainty concerning the dosage of serum to be employed, this Institute will always be prepared to submit advice on the subject.

In order to avoid any risk of an animal receiving only a dose of virus it is a good practice not to inject virus until the individual animal has been injected with serum.

7. VIRUS OR VIRULENT BLOOD.

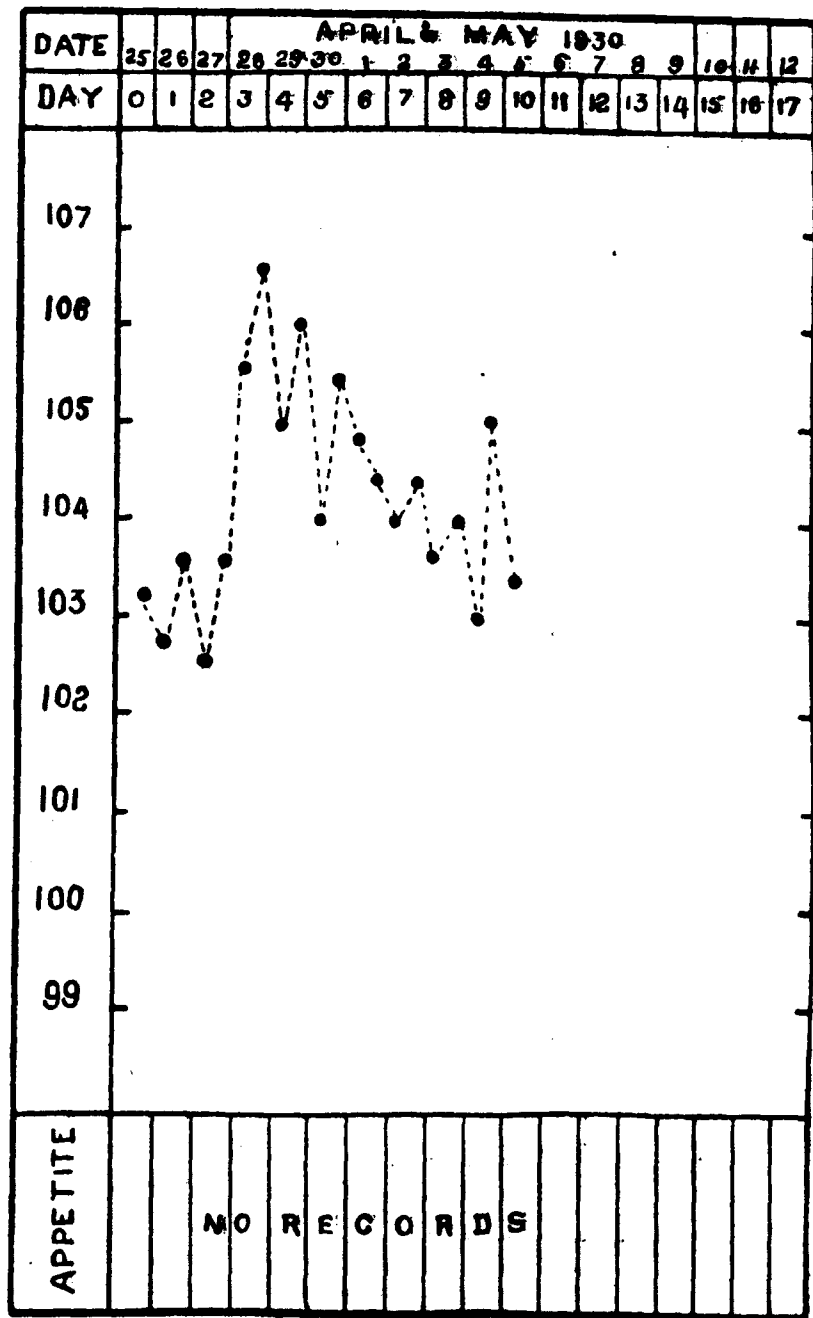
Two forms of virus for use in the serum-simultaneous inoculation of cattle are prepared and issued from the laboratory :—

(a) *Ox virus*.—This product consists of virulent blood drawn from highly susceptible hill bulls at the laboratory and is issued in bulk for the direct inoculation of cattle in the field. When ox virus is employed it is very desirable that at least one and preferably two susceptible cattle of small value should be given virus alone and no protective serum in order to serve as controls. Very young calves should not be used for this purpose. Such controls serve a two-fold purpose : (1) the extent of reaction exhibited in these animals provides an indication concerning the virulence of the virus used for the immunisation : (2) if the controls react well within five days after



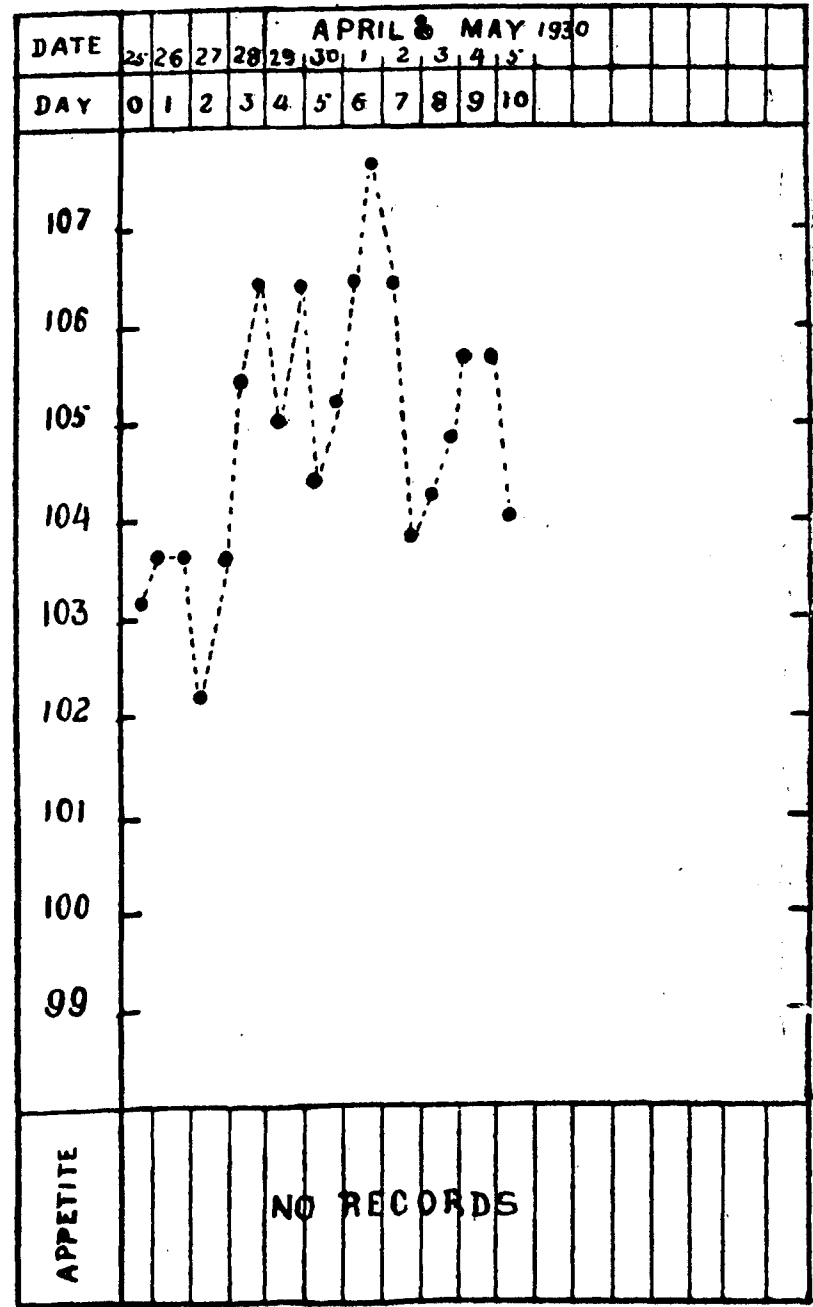
Illustrating severe uncomplicated rinderpest in a goat, ending in death; Goat No. 351 (Muktesar) injected with goat virus on 23rd July 1930.

CHART No. 2.



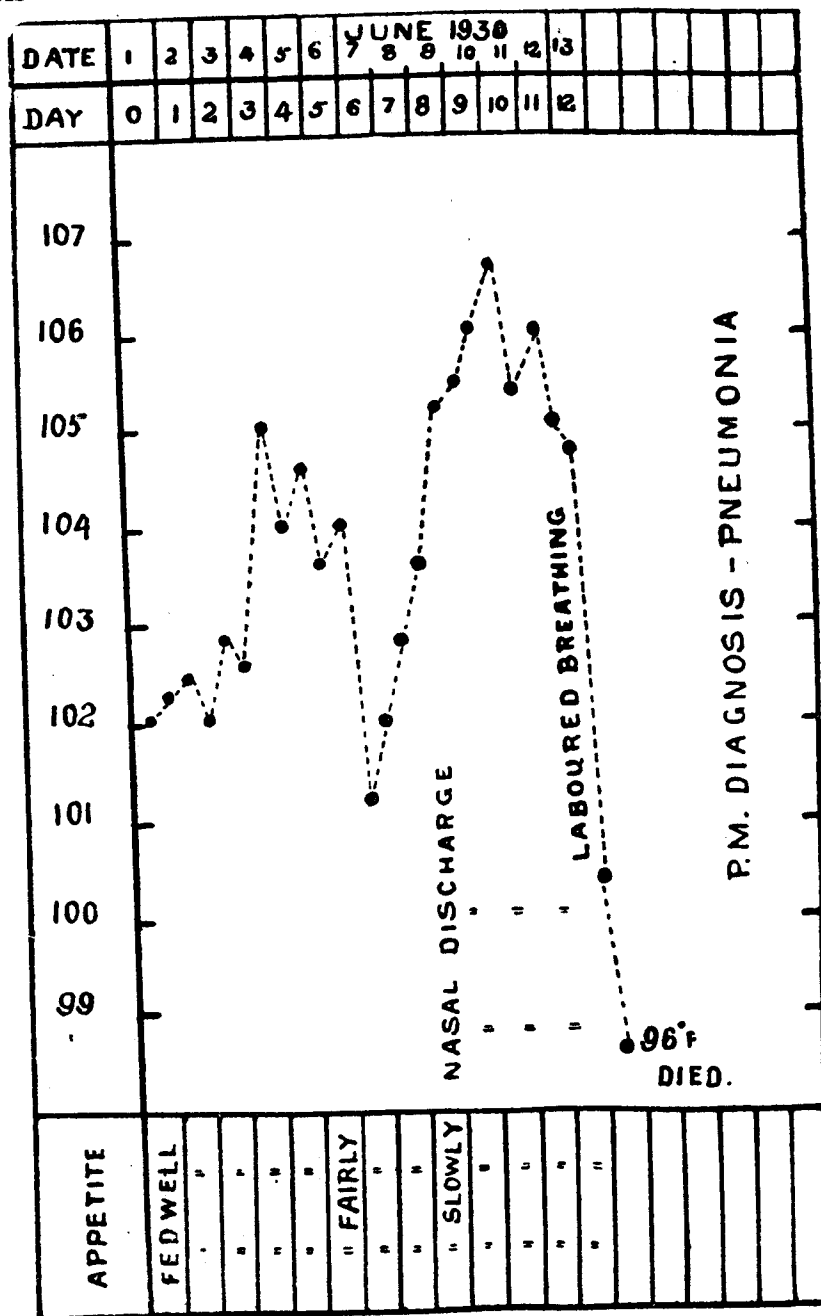
Illustrating a suitable rinderpest reaction in a goat virus producer in the field; Goat No. 4 (Jubbulpore) injected with goat virus on 25th April 1930.

CHART No. 3.



Illustrating fever of complicating pneumonia superimposed on a good rinderpest reaction in a goat; Goat No. 111 (Jubbulpore) injected with goat virus on 25th April 1930.

CHART No. 4.



Illustrating a rinderpest reaction and delayed pneumonia in goat No. 107 (Muktesar) injected with goat virus on 1st June 1930.

injection they may be bled and the virulent blood thus obtained may be used for a second inoculation into the animals undergoing immunisation.

(b) *Goat virus*.—This product is despatched from the laboratory in three sealed ampoules to be used for the manufacture of virulent blood by the operator himself. The goats intended to act as virus producers should be arranged for several days before they are required for injection, in order that temperature records can be taken and noted twice a day for at least 3 days before injection, and those animals showing a considerable fluctuation in body temperature or with a persistent "normal" temperature over 103°F. should not be used as virus producers. In very hot weather it may happen that all goats show a markedly higher temperature in the afternoon and evening than in the morning. In this event, it is sometimes necessary to take only the early morning temperature, and such goats as may show a "normal" temperature above 103°F. at this hour should be rejected as being unsuitable for virus production. At least two goats showing a fairly constant pre-injection temperature should be selected as virus producers and these should be injected with the goat virus immediately on its receipt from Muktesar. Mix the contents of all the three ampoules and inject the mixed sample subcutaneously into the two selected goats.

8. THE RINDERPEST REACTION IN GOATS.

A distinct rise in temperature occurs on the third, fourth or fifth day after injection of the virus. The temperature reaction lasts for about five or six days and a good virus is produced even if the goat shows no other signs of ill-health at all and eventually lives its normal life. (Chart 2). Often, however, the goats will show signs of malaise and inappetence and some may die. (Chart 1). In a large proportion of animals, a *secondary rise of temperature* occurs with marked symptoms of pneumonia and in such cases death usually supervenes. (Chart 4). The rise in temperature due to rinderpest may be only from 2 to 3 degrees above the normal, whereas in the later stages, that is, after the fifth day the temperature may reach 106 or 107°F. due to the complicating pneumonia, and at this late stage the goats must *not* be bled for virus. (Chart 3). The optimum day of bleeding is the fourth day after the injection of virus, but if a suitable reaction occurs, goats may be bled on the fifth day.

9. PREPARATION OF GOAT VIRUS FOR INJECTION.

The blood is run out of the jugular vein by means of a suitable bleeding needle or canula into a clean glass vessel that has been sterilised by boiling beforehand. To prevent clotting of the blood, some strands of metallic wire or glass beads are placed in the vessel

to defibrinate the blood by vigorous shaking for some minutes after it has been let into the flask. Clotting can also be prevented by running the blood into about one-tenth its volume of a 4 per cent. solution of potassium or sodium citrate. Inoculation of the cattle with serum should not be commenced until the virus has been prepared ready for injection.

A dose of goat virus used for immunising cattle should be injected also into two more goats which will serve both as controls and virus producers for a second inoculation into the cattle in the same way as in the case of ox virus.

10. VIRUS INOCULATION.

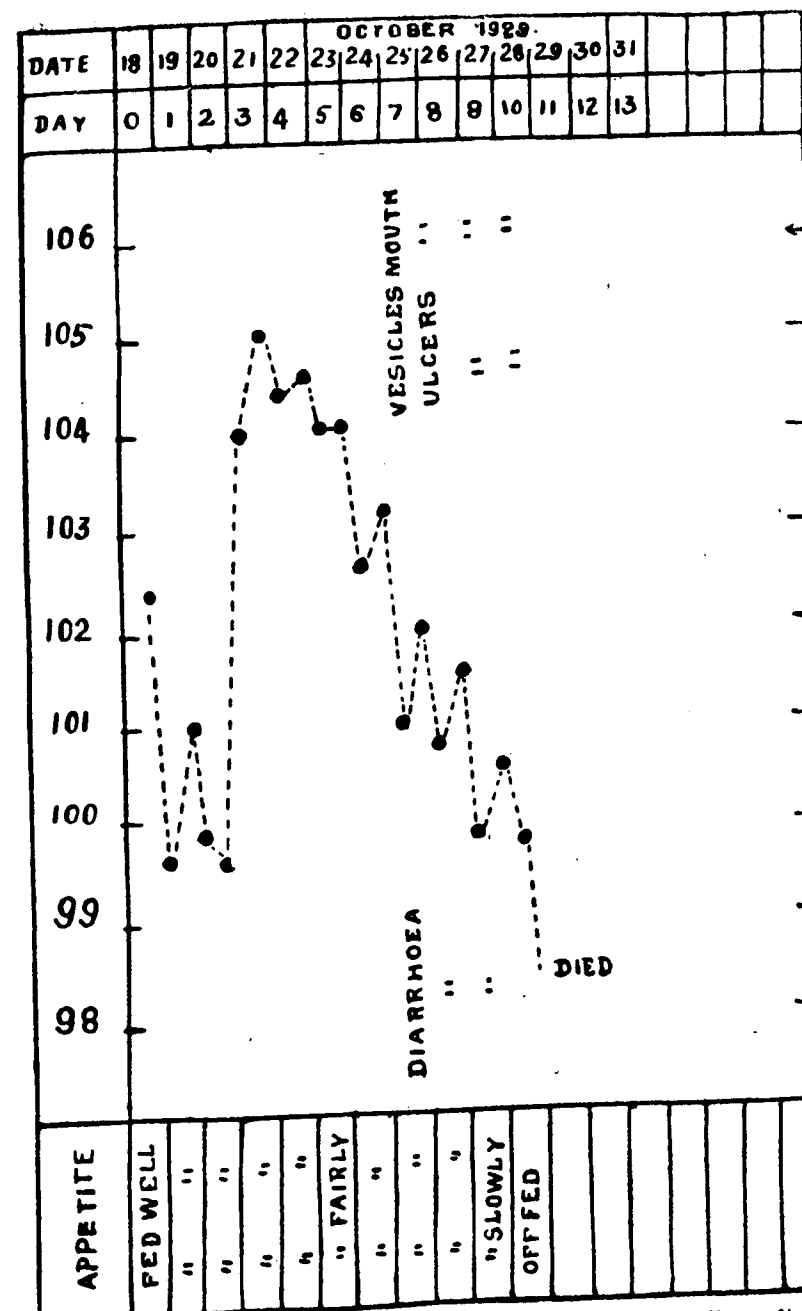
Whichever form of virus is used, it is important to remember that it is extremely fragile and is liable to deteriorate in potency rapidly. A high temperature affects it adversely, and on exposure to the air it will become completely inert probably within two days. Neither form of virus can be considered fit for use after *eight days* from the date given upon the label or packing slip. Arrangements should be completed beforehand so that inoculation of the virus is carried out *immediately on receipt* from the laboratory. If this is not possible, the virus may be stored for one or two days upon ice, provided only that the containers remain unopened. It should be taken as an invariable rule that once the sealed container has been opened, its contents *must* be used that very day or else it must be discarded and a new consignment sent for.

The dose of virus to be injected into cattle undergoing immunisation need not be gauged with any pretence at accuracy since a minute quantity only of virulent blood is necessary to infect. The usual dose is from $\frac{1}{2}$ c. c. to 1 c. c. of blood. Larger doses up to 5 c. c. or more are usually employed for controls, but the degree of reaction is not influenced by the dose of virus administered.

11. SECOND INJECTION OF VIRUS.

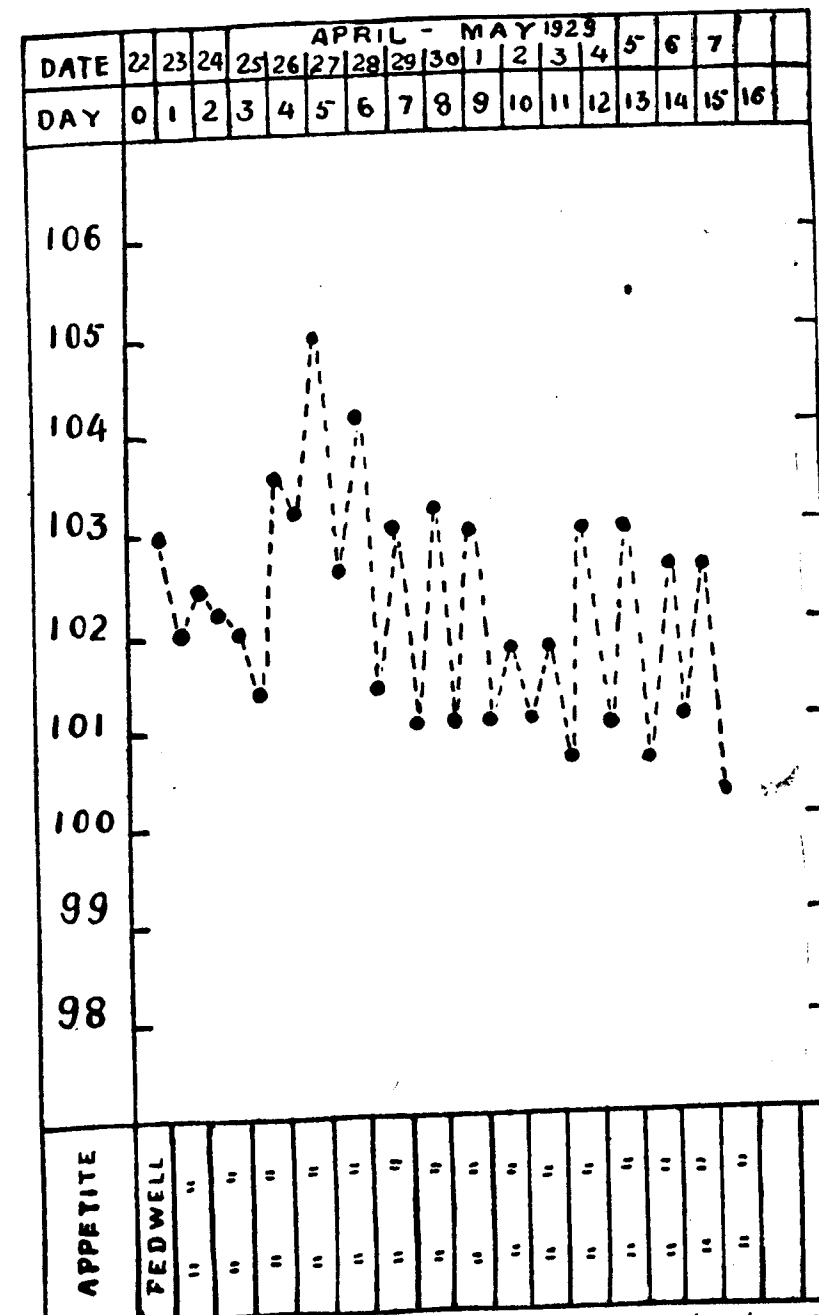
Provided that an animal receives a dose of certainly virulent virus at the first injection, no further injection is theoretically necessary. In practice, however, it is strongly recommended that a second injection of virus be given to all animals except those in which a definite temperature reaction has occurred between the third and fifth days after the first injection. The dose of virus usually employed for the second injection is 5 c.c. and can conveniently be obtained from cattle or goats used as controls during the first injection. If it is desired to make certain that virulent blood will be available for the second injection then arrangements should be made beforehand for a second consignment of virus to arrive from the laboratory *within eight days* after the first injection. Since the

CHART No. 5.



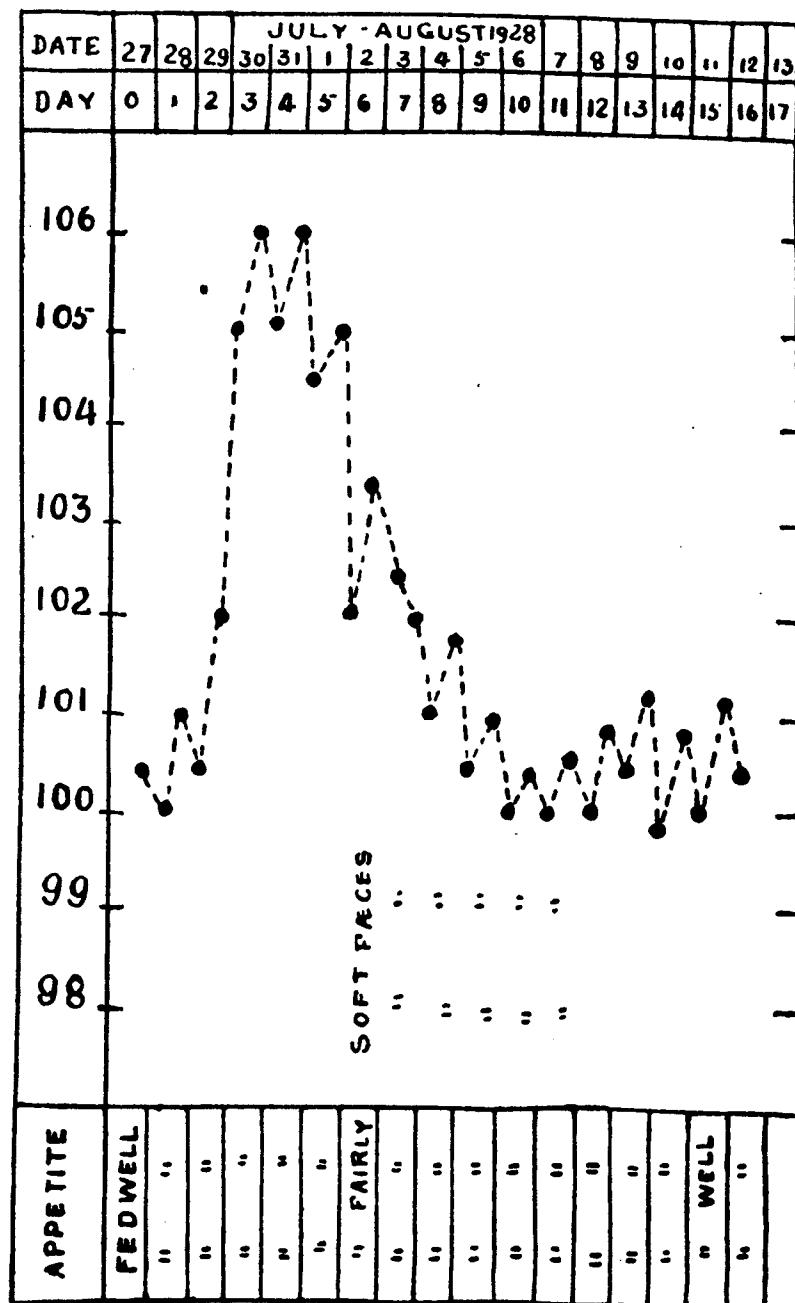
Illustrating severe and typical uncomplicated rinderpest in a bull; ending in death; Hillbull No. 939 (Muktesar) injected with ox virus on 18th October 1929.

CHART No. 6.



Illustrating a mild uncomplicated rinderpest reaction to goat virus in a cow in serum simultaneous inoculation; Thar-parkar cow No. 125 (Karnal) injected with serum and goat virus on 22nd April 1929.

CHART No. 7.



Illustrating a marked uncomplicated rinderpest reaction in a control bull given goat virus and ending in recovery; Hill-bull No. 421 (Muktesar) injected with goat virus from goat No. 351 (see chart No. 1) on 27th July 1928.

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protective effect of anti-rinderpest serum lasts only for nine days it is imperative that the second injection be given well within this period. It has already been pointed out that the locally produced virulent blood from the controls to the first injection will be available either on the fourth or fifth day, and this arrangement is therefore a very convenient one. Since second injections of virus are intended to "catch" the animal that has escaped receiving a dose of virulent blood at the first injection the second injection must be given while the serum is still conveying a passive immunity to the animal, that is, within the nine day period after serum inoculation.

12. CONTAMINATED VIRUS.

A sample of every consignment of virus is submitted to bacteriological examination before despatch from the laboratory, but the results of the examination are not known until two days later. If the sample is found contaminated with extraneous organisms a telegram is sent immediately to the customer advising withholding use of the virus. When bacteria are detected they are nearly always in themselves harmless in their effects when injected into an animal, but their presence causes the blood to decompose and may render the virus inert within a short period of time. Any sample of virus having a disagreeable odour or having become obviously contaminated or putrid must be discarded. The last remark applies also to serum that has a disagreeable odour or is markedly altered in appearance or consistency.

13. COMPARATIVE VALUE OF OX AND GOAT VIRUS.

(a) *Virulence*.—Virus produced from susceptible cattle is highly virulent and there is therefore always a risk of producing severe rinderpest reactions in the inoculated cattle if the serum has been used in too small a dosage. On the other hand, if a proportion of the inoculated cattle show evidence of a rinderpest reaction then great confidence can be placed in the value of the protection set up.

Goat virus has a somewhat "fixed" or steady virulence usually considerably lower than that of virus taken direct from cattle, and is therefore generally safer to use (Chart 7.)

(b) *Intercurrent infection*.—Ox virus may contain piroplasms which are potentially infective organisms for cattle. Indian bred cattle are, however, usually already "premunised" against these parasites, that is, they have already been naturally infected as calves and are "carriers" of them during the rest of their lives, and therefore have a degree of immunity. Imported European and sometimes even Indian bred cattle have no immunity to these piroplasms and therefore may show severe reactions, as described below. The reaction to the "redwater" parasites (*B. bigemina*) can, however, be controlled

by trypanblue, and if cattle pass safely through an inoculation with ox virus containing piroplasms they can be considered to have been "premunised" against the diseases produced by the parasites as well as protected against rinderpest.

Goat virus, on the other hand, is "cleansed" of the cattle piroplasms since these parasites cannot infect goats. There is no risk, therefore, of injecting pathogenic piroplasms into cattle.

(c) *Local virus production*.—It cannot be ascertained if the ox virus used for inoculation is certainly virulent until rinderpest reactions have been exhibited in the controls and/or some of the inoculated animals. If no reactions at all are exhibited in any of the animals injected with the virus, then the value of the protection conferred upon the cattle remains unknown. It will be too late at this stage to obtain a further supply of virus, unless arrangements for it have already been made beforehand, and the serum and virus injections must then both be repeated if it is desired to make certain that the cattle have been protected.

By observing the reactions in the goats used for virus production, however, the operator can make himself reasonably assured that he is actually inoculating living virus into the cattle to be immunised, and an almost unlimited supply of fresh and reliable virus for immediate use from cheap and easily procurable animals is also available when the goat virus method is adopted.

14. HYPODERMIC SYRINGES.

At least two syringes are necessary, namely, a small syringe for the inoculation of virulent blood and a large syringe for the inoculation of serum. The "Record" type of syringe is recommended since it has a glass barrel and the contents can thus easily be seen at the time of injection. When a syringe having a metal barrel is used, care must be taken to make sure that it is working properly, and contains the full quantity of fluid before an injection is made. Syringes of 1 c.c. capacity for virus, and 50 or 60 c.c. capacity for serum are convenient sizes to use. Another type of large syringe is the so-called "Stockman" syringe in which the barrel can be refilled without withdrawing the needle from the seat of inoculation or detaching its nozzle. All syringes must be cleansed and sterilised by boiling for at least 10 minutes before use. It is necessary to detach the component parts of glass barrel syringes and place them separately in water for boiling, otherwise the glass barrel is likely to crack.

15. THE RINDERPEST REACTION IN CATTLE.

A typical rinderpest reaction following the injection of virus into a highly susceptible animal starts by a sharp rise in temperature at the earliest on the 3rd day and usually

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not later than the fifth day after inoculation. Fever may last for from 3 to 6 days and towards the end of this period in severe reactions other specific symptoms may occur, namely, the appearance of vesicles and ulcers in the mouth, and diarrhoea. With the onset of diarrhoea the temperature usually drops rapidly. In the most severe reactions, the temperature becomes sub-normal and death may follow between about the 10th to 15th day after injection of virus. (Chart 5). In experimental infection with rinderpest therefore the reaction is characteristic and extends over a very limited period of time.

In "plains" cattle used as controls very severe reactions do not always occur, but graded reactions of the same type are to be expected in them, which may consist of fever only. A similar reaction consisting of fever alone, may also be exhibited in some of the cattle under immunisation. (Chart 6).

Any other type of reaction that may be seen is due to a complicating infection, usually from protozoon parasites, as described below.

16. PIROPLASMOSIS.

The "piroplasmoses" are diseases caused by invasion of red blood cells with numerous minute animal parasites (piroplasms). In natural circumstances they are transmitted to animals by the bites of ticks, but they can also be transmitted artificially from an infected animal or a "carrier" of the piroplasms, to a susceptible healthy animal. In this manner they may be injected inadvertently into the inoculated cattle with the virulent blood. In many localities all the cattle become infected naturally while they are young, by the bites of ticks. Young cattle possess a high degree of resistance and recover readily, but they always harbour small numbers of the parasites in a dormant state in their systems afterwards throughout life. During even a mild attack of rinderpest the parasites may be roused again from their dormant state owing to the depressed condition of the animal's body and invade the system once more in large numbers. This awakening of the parasites may take place at any time after inoculation of rinderpest virus and the disease then seen is not due to any piroplasms that may have been present in the virulent blood. This so-called "resuscitation" may therefore occur when the goat virus method is used although that virus has been cleansed of piroplasms. (Chart 11). There are two main diseases of cattle due to "piroplasms".

(a) *Redwater*.—The parasites which produce this disease are known as *Babesia bigemina*, which are relatively large bodies found within the red cells, often resembling two-pears meeting towards

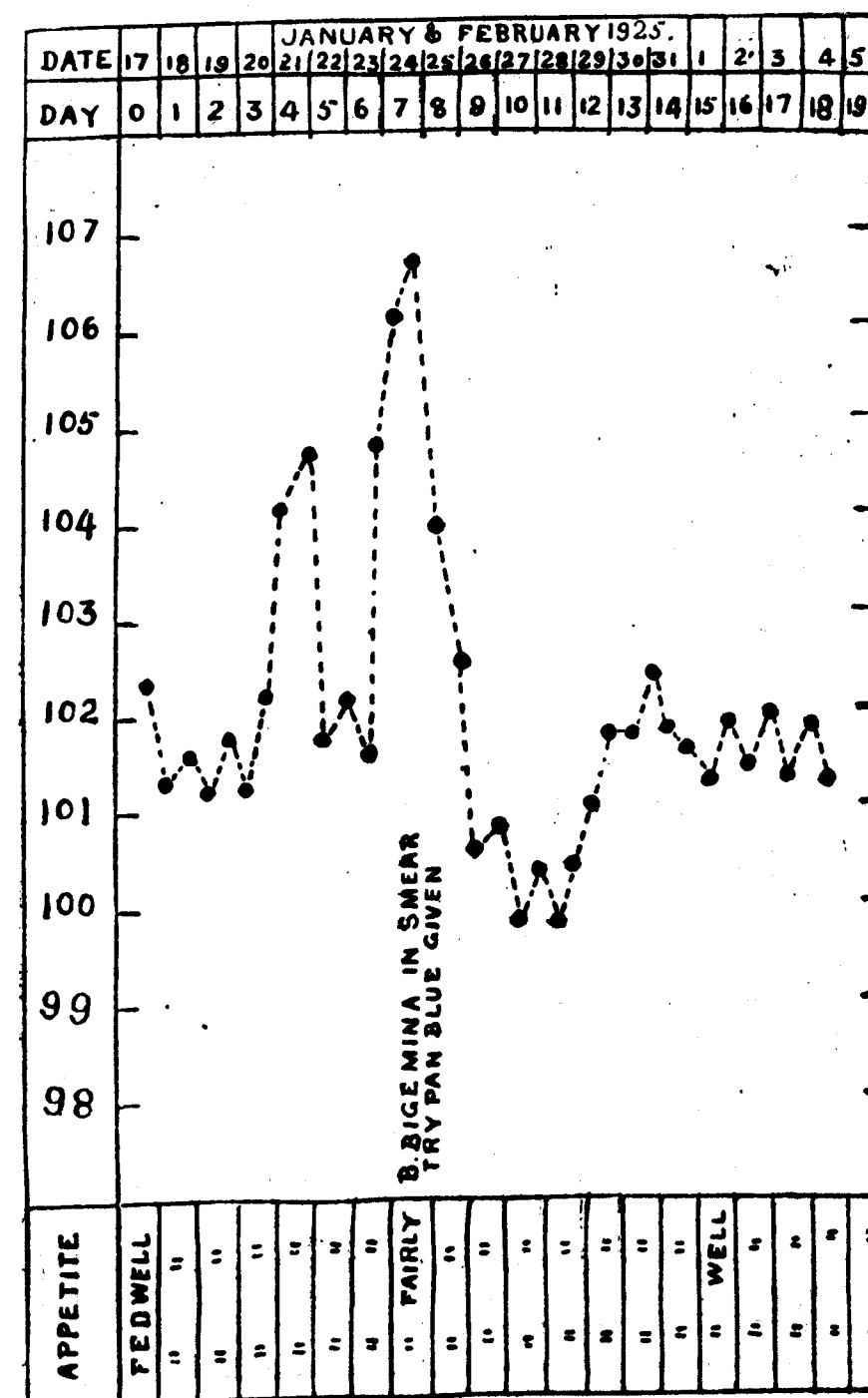
their narrow ends, or else appearing in large round forms resembling a signet ring. (Plate 1, fig. 1). The reaction due to redwater organisms often occurs on the sixth evening (charts 8 & 9). It may, however, occur until about the tenth day, or sometimes a day, or two later. The reaction consists of a sharp rise in temperature usually much higher than that observed in rinderpest. The two reactions may be superimposed, thus fever due to rinderpest may be exhibited from the 3rd, 4th or 5th days and a further rise perhaps to 106 or 107°F., due to red water may be seen on the 6th evening or later (Charts 8 and 9). The complicating disease is frequently associated with the characteristic clinical symptoms of redwater, namely, the passing of urine coloured red or dark-brown from the presence of destroyed blood excreted by the kidneys; sometimes, however, the animal may die suddenly without exhibiting any such symptom (Chart 10). The resuscitated disease is similar except that it may occur either earlier or later than when due to inoculation.

A form of specific treatment is available for this disease, namely, the use of the drug Trypanblue (Chart 8). Dissolve the powdered drug to form a one per cent solution in boiled water, and preferably filter the solution before use. It is highly advantageous to inject the drug *intravenously* since its action is then more rapid and occasionally severe swellings may be caused if it is injected subcutaneously. It is advisable to use not less than 50 c. c. of the solution for calves and up to 150 c. c. or more for large animals.

In carrying out serum-simultaneous inoculations it is strongly recommended that an ample supply of Trypanblue should be available. It is not necessary to wait for confirmation of the diagnosis of piroplasmiasis by blood smear examination, but it is advisable to inject the drug without delay when a fever reaction occurs on the evening of the 6th day or later, or when hyperpyrexia is exhibited. If the complication is due to *B. bigemina*, then a rapid drop in the temperature occurs. If high fever continues, it is probably not due to these parasites, but the injection of Trypanblue will have done no harm.

(b) *Theileriasis*—This infection is probably more widespread than that with *B. bigemina*. The parasites most commonly responsible for this disease in India are known as *Theileria mutans* which are much smaller than *B. bigemina*; usually seen inside the red blood corpuscles as minute red-shaped organisms or as very small "rings". (Plate 1, fig. 2). The most usual form of the disease is a very chronic or "carrier" infection in which ill-effects are not recognisable. It is possible that although the parasites may increase slightly in number during a rinderpest reaction they seldom cause serious disease due to resuscitation in the same way as occurs with the Redwater parasite. When, however, inoculated with rinderpest

CHART No. 8.



Illustrating a redwater temperature reaction following upon a mild rinderpest reaction in a bull and ending in recovery under treatment with trypanblue; Hill-bull No. 3124 (Muktesar) serum and ox virus injected on 17th January 1925.

[illegible]

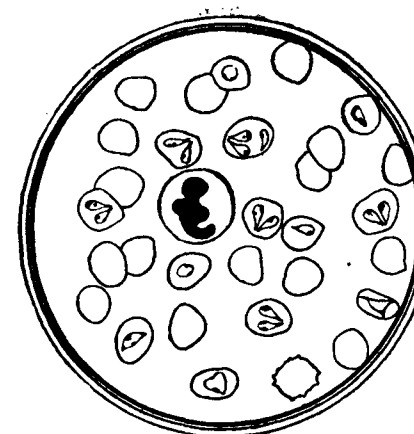
Illustrating a "redwater" temperature reaction superimposed upon a severe rinderpest reaction in a bull and ending in death; HIN-bull No. 1348 (Muktasar) injected serum and ox virus on 16th January 1925.

[illegible]

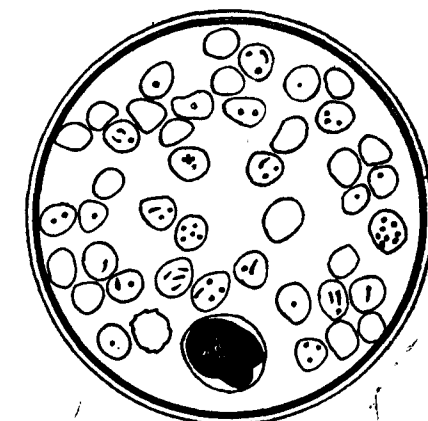
Illustrating sudden death from redwater in a calf without symptoms other than fever, following upon a mild rinderpest reaction: Control to serum-simultaneous anti-rinderpest inoculations $\frac{7}{8}$ bred calf No. 524 (Bangalore) ox virus injected on 10th February 1924.

	DATE	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27				
	DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
BIGEMINA IN SMEARS TRYPAN BLUE INJECTED		102.8	101.8	102.1	101.8	102.1	101.5	100.9	100.7	100.7	100.7	100.5	100.3	100.7	101.1	100.6	101.3	101.5	101.5	101.8	100.7	101.6	101.3
APPETITE	FED WELL	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	" FAIRLY	" WELL	" "	" "	" "	" "	" "	" "			

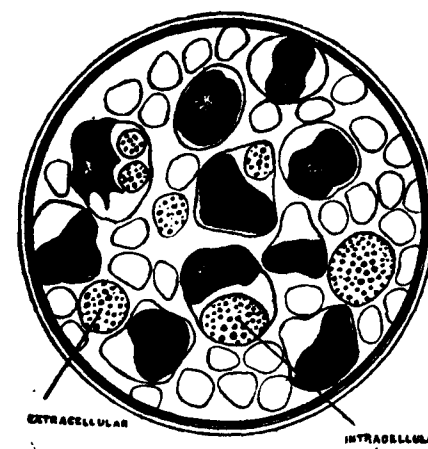
PLATE I.



50 MICRONS
FIG 1. B.BIGEMINA FROM
BLOOD SMEARS.

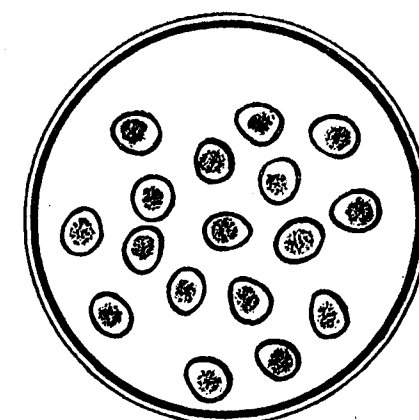


50 MICRONS
FIG. 2. T. MUTANS FROM
BLOOD SMEARS.



50 MICRONS

FIG. 3. KOCH'S "BLUE BODIES" FROM GLAND SMEARS.

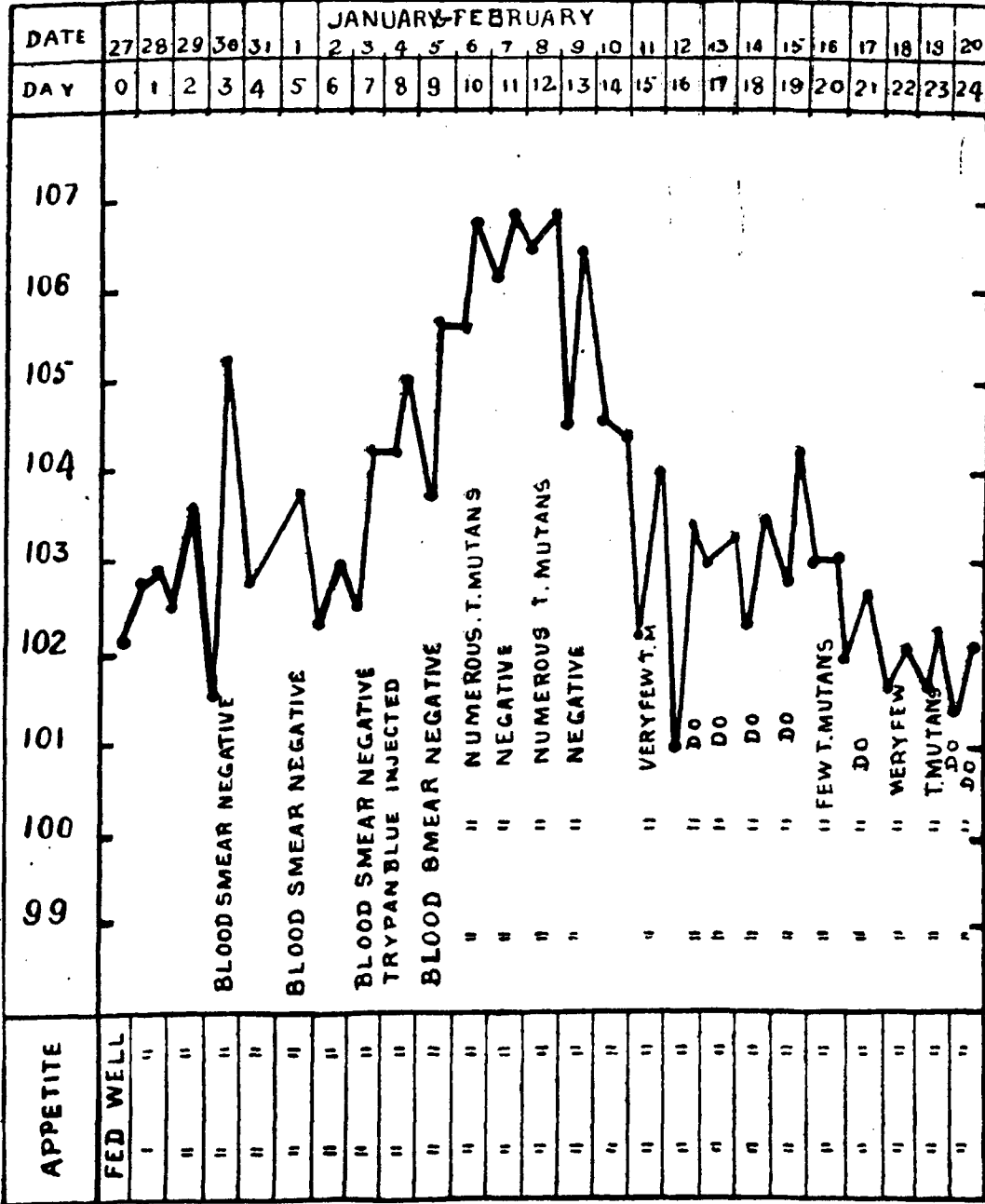


100 MICRONS

FIG. 4. OOCYSTS OF BOVINE COCCIDIA FROM FACES SMEAR.

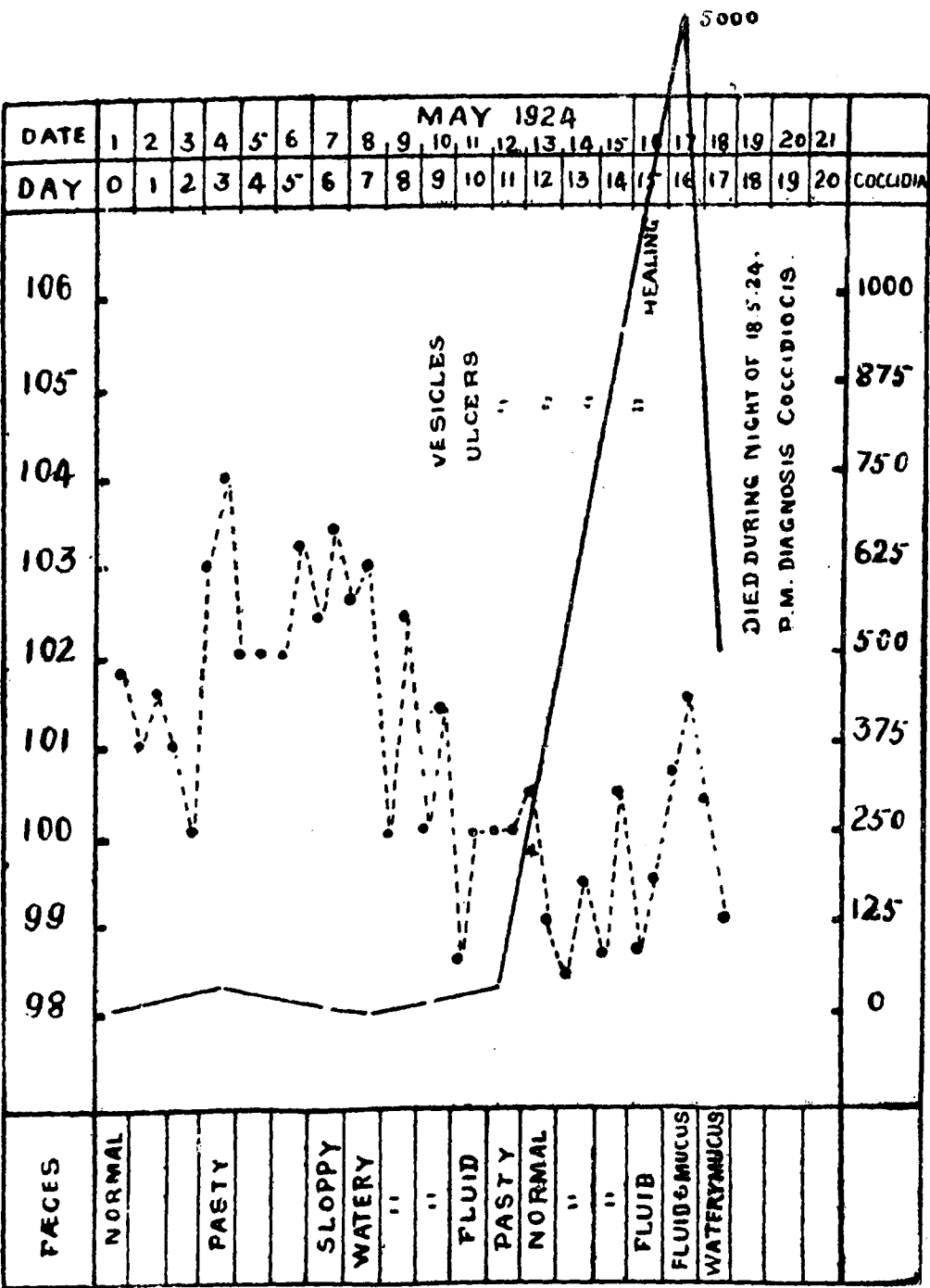
The plate consists of four composite pictures each made from camera lucida drawings taken from several representative smears. The figures illustrating the "piroplasms" represent the parasites as they are seen under a high power (1/12th inch oil immersion lens) of the microscope, whereas the coccidia are magnified only about one-third the size of the "piroplasms", and represent them as seen under a low power (1/6th inch dry lens).

CHART NO. 12.



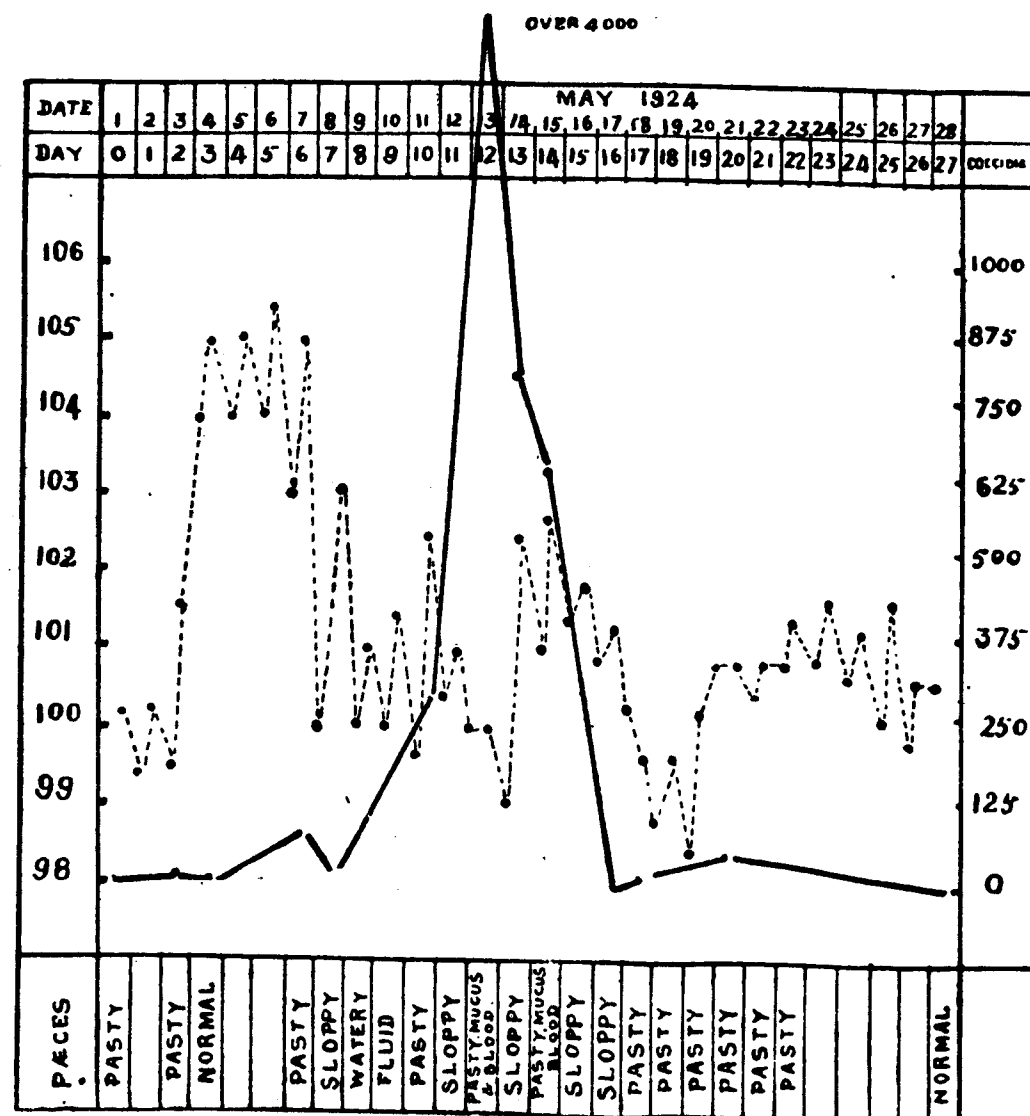
Illustrating acute theileriasis in a bull following upon a mild rinderpest reaction, and ending in recovery; Imported Holstein bull (Allahabad) serum-simultaneous anti-rinderpest Inoculation given on 27th January 1927.

CHART No. 13.



Illustrating clinical coccidiosis in a bull following upon a severe rinderpest reaction and ending in death; Bull No. 156 (Mubtaseh) serum and ox virus injected on 1st May 1924

CHART No. 14.



Illustrating clinical coccidiosis in a bull following upon a severe rinderpest reaction and ending in recovery; Hill bull No. 123 (Muktesar) ox virus injected on 1st May 1924.

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blood, the organisms may set up an acute and severe disease in susceptible animals, particularly in imported stock and sometimes in cross-breds (Chart 12). The reaction consists in very high fever (106°F or more) occurring not as suddenly as in Redwater, but it is continued steadily for a number of days. During this stage of high fever parasites may not be very frequent in the blood stream. Subsequently the temperature fluctuates and parasites then become very numerous in the red blood corpuscles. A common symptom is lachrymation and watery discharge from the nostrils. Treatment with Trypanblue usually has no appreciable effect. (Chart 12). In animals that succumb, the structures known as "Blue bodies" identical with those seen in East Coast Fever of Africa may be detected in the spleen and other lymphoid tissue, and these bodies may also be seen in lymphatic gland puncture smears made during life at the height of the disease (Plate 1, fig. 3). These bodies may also occasionally be found in blood smears.

Unfortunately at the present time no specific treatment is known for the acute severe form of Theileriasis in cattle. The drug "Plasmoquine" is under trial at the present time, and in some cases it appears to have a beneficial effect in reducing the fever. It is given by *intramuscular* injection in doses up to 30 c. c. of a one per cent. solution for the largest type of imported animal, such as a full grown Holstein Bull. The injection is repeated daily up to four or five days. Very careful attention should be paid to general nursing and hygiene of all affected animals.

17. COCCIDIOSIS.

This is a disease condition caused by minute egg-shaped protozoan parasites (known as coccidia) which inhabit, as dormant parasites, the intestine of a considerable proportion of all breeds of Indian cattle. It is not possible, of course, for these organisms to be transmitted with virulent blood used in serum-simultaneous inoculation, but the parasites already present in the intestine may quite frequently be resuscitated from their state of dormancy, if the animal harbouring them develops a rinderpest reaction sufficient to cause diarrhoea. (Charts 13 and 14). Ordinarily the diarrhoea due to rinderpest lasts only for a few days and in normal mild attacks it quickly clears up. If the attack is complicated by a resuscitation of coccidia, on the other hand, the diarrhoea is much prolonged; the faeces become very fluid in consistence and foetid in odour. Then follow the clinical symptoms of a true dysentery. A large amount of mucus is passed with at first streaks of blood; the proportion of blood becomes greater until blood clots can be recognised mixed with the faeces.

Diagnosis at this stage is readily made by examination of shreds of the mucus placed between a glass slide and cover slip and examined

as a "wet" unstained preparation with a low power of the microscope. In such preparations the parasites (the so-called "oocysts") are seen as round to ovoid nearly transparent bodies containing a central collected mass of refractile material. (Plate 1, fig. 4.) The stage during which the "oocyst" form of the parasite is present in large numbers in the faeces lasts, however, only for a very few days but the clinical symptoms of severe dysentery persist for several days after the parasites have apparently disappeared. The presence of much mucus and streaks of blood or actual blood clots in the faeces can be taken to be diagnostic of clinical coccidiosis.

No specific treatment has yet been found to have any direct effect upon coccidia. The disease, however, usually yields to ordinary medicinal and hygienic measures. It is essential to keep affected animals well protected from cold and damp. They should be kept warm by the use of rugs and careful attention must be paid to diet which should be nutritious and given in small quantities frequently. The administration of intestinal astringents and antiseptics as well as general stimulants should supplement the ordinary measures of nursing.

The complications of serum-simultaneous inoculation as described above should be borne in mind and understood by officers undertaking this form of inoculation, but it is to be remembered that they occur comparatively infrequently and the loss due to them is extremely small when it is calculated among the very large number of cattle inoculated properly by this method. Complicating infections due to inoculation with the virus cannot be avoided, but by the application of prompt treatment the possibility of serious consequences can be reduced to a minimum. Complications due to resuscitation of dormant parasites usually indicates an insufficient quantity of serum used against a potent virus.

SUMMARY.

1. All cattle and buffaloes may be inoculated except :—
(a) debilitated animals;
(b) cows in very advanced pregnancy.
2. Repeat inoculation of calves after two years.
3. Restrict movement of inoculated animals.
4. Use only *special white label serum*.
5. Do not inject less than 30 c. c. of serum.
6. Use virus *immediately* on receipt.
7. Do *not* use virus or serum that has become grossly contaminated.
8. Use goat virus only if reactions in virus producers are fully satisfactory.
9. Use *controls* whenever possible. They provide virus for second injections.
10. Give *second injections* of virus in all cattle that have not reacted to the first injection.

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11. Give *second injections* of virus *within 8 days* after the first injection.
12. Make certain that syringes contain the full amount of virus or serum before injecting a dose.
13. See that each animal receives the dose of serum *before* virus is injected.
14. If fever occurs on or after the *sixth day*, inject Trypanblue at once.

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 [We are thankful to the Secretary, Agricultural Research Council, for lending us the blocks used in this article, Ed. I. V. J.]

General Articles

SOME OBSERVATIONS ON TRYPANOSOMIASIS IN MADRAS PRESIDENCY.*

BY

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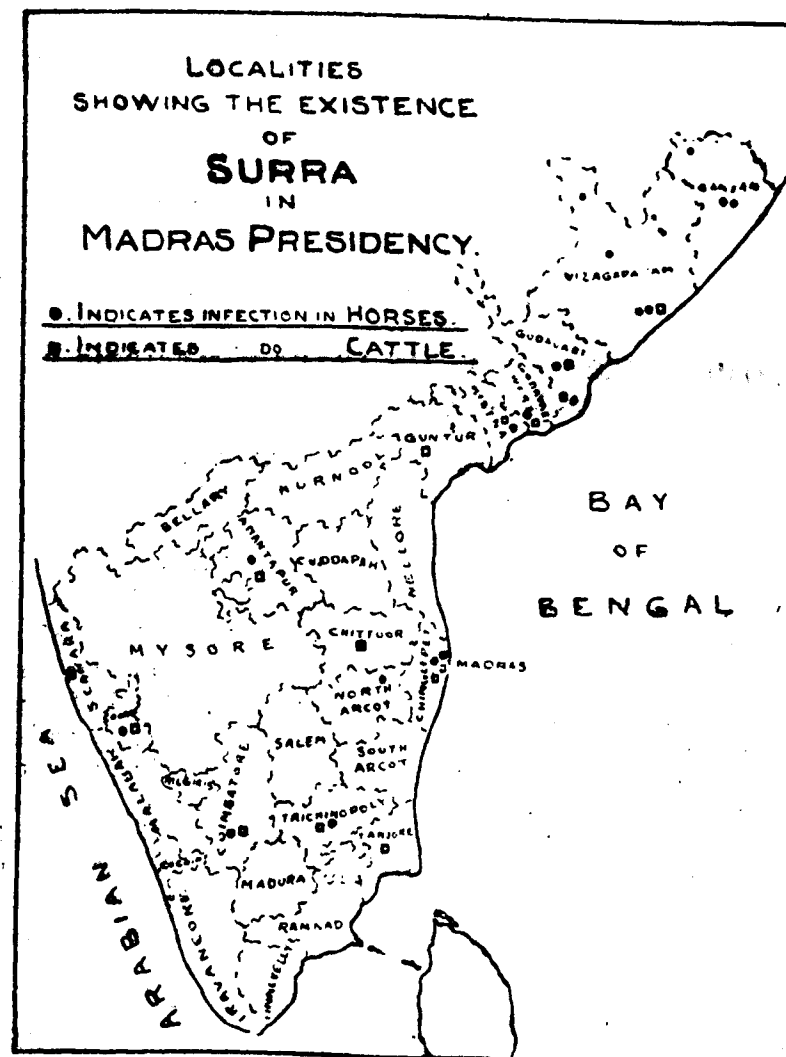
AND

L. S. PARAMESWARA AYYAR, G.M.V.C.,
 (Assistant Lecturer, Madras Veterinary College, Madras.)

It is fairly common to find trypanosomes in the blood of our domestic animals. The horse, donkey and the mule are most susceptible to 'Surra'. The dog also dies of 'Surra'. The buffalo and the bullock harbour trypanosomes in them in a latent form without manifesting any symptoms. This belief is perhaps only partly correct, because outbreaks of trypanosomiasis in cattle have been observed in this presidency and the mortality rate has been found to be about 20 to 30% during the outbreaks. Cross (1922) describes an acute and chronic form of surra in camels and says that in the acute form the onset of death is sudden, the animal falling down in convulsions before death. Similar acute symptoms have been seen in cattle here. The bullocks, apparently in good condition, suddenly drop down and die in a fit of convulsions, so much so, that such deaths were suspected to be due to anthrax, but the examination of blood smears revealed trypanosomes. Chronic cases showing progressing anaemia before death have also been noticed. Edwards (1928) says that virulent outbreaks of surra occur among cattle and

* Read at the Seventh All-India Veterinary Conference, Bangalore, December 1930.

notably among buffaloes in which a mortality rate amounting to 25 to 30% and in some outbreaks 75 to 80% has also been reported. Perhaps this refers to those outbreaks in Northern India. In the light of the data now available, one understands that bovidæ are not immune to surra, even if they do not succumb to it, yet they often get emaciated, more or less, during the course of the disease. This



means their working capacity falls low, therefore this disease is of economic importance and more attention has to be paid to its prevention and cure.

Regional distribution in the Madras Presidency.—A spot map has been appended to show the places where trypanosomes have been found in the blood of domesticated animals. The data for

this map were obtained from the registers of specimens examined in the Madras Veterinary College Laboratory covering over a period of six years. Blood smears are received from various parts of the Presidency for examination and report and the results are entered in these registers.

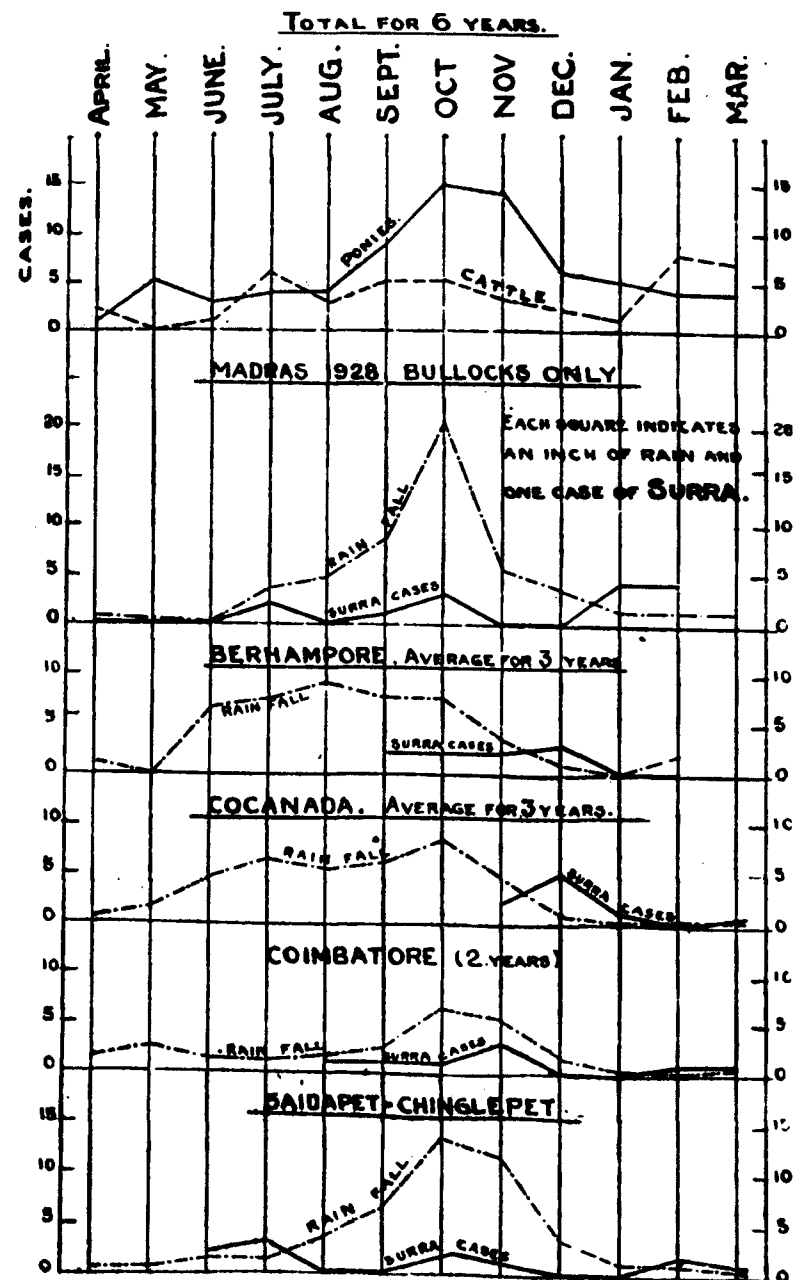
About 23 years ago it was thought that the Deccan was immune to surra (Laveran and Mesnil 1907). The spot map shows that surra is fairly widely prevalent in this Presidency and it seems to be more in the Northern Circars than in the rest of the Presidency. Though it may seem that the surra areas are isolated, the discontinuity of distribution is probably more apparent than real owing to absence of reports rather than absence of disease.

Seasonal Incidence.—To study seasonal incidence, graphs have to be plotted for each surra zone and also graphs of rainfall in the same locality. A few of the graphs are appended and it is apparent from them that trypanosomiasis is found more during the cold weather than in other seasons. There seem to be three peaks in the curves, one just before the monsoon, one during and one after it. The latter is the higher one and it happens to be the cold season then. Take for example the curve for Madras for the year 1928 and it is typical in showing the three peaks.

A few remarks on transmission by large biting flies.—It is often said that during the monsoon biting flies abound and the disease spreads. Various workers have incriminated various kinds of biting flies as possible vectors, and a few of them have even gone so far as to describe a cyclical development in some of them which has not been proved yet. Some said that a haematopinus is also responsible. In fact there is hardly a statement made by one worker that is not directly contradicted by another. We will try to discuss these flies and the disease in Madras. One of us (M.A.R.) has observed in and round Madras, three broods of *Tabanus* during each year. The first one appears in February, the second and the largest about the end of June and the third which is the smallest appears about October. If we look at the graph of surra we see that the number of surra cases is most in July, October and January. These coincide with the fly incidence excepting the peak in January in Madras and the peak in Berhampore and Cocanada in December. Why it should be so is an interesting point. The rise is during a period when flies are extremely few or absent. In a private communication from the Government Entomologist in Coimbatore the *Tabanus* flies seem to appear there in July and begin breeding in the paddy fields. The second Entomologist (Dipterist) of the Imperial Institute of Agricultural Research, Pusa, has very kindly informed me that the period of the greatest abundance of *Tabanidæ* in Madras Presidency is from the

beginning of July to the end of September. But the graphs show that the height of disease is in October, a time when the flies are

CURVES OF SURRA CASES.



a few in number or have disappeared altogether. The consensus of opinion about transmission of this disease seems to be that it is only

Observations on Trypanosomiasis in Madras Presidency 115

possible mechanically; that is, a *Tabanus* bites an infected one and when disturbed goes to another healthy animal and completes its meal, when the trypanosomes existing in the remains of the first, feed on the proboscis, get into the second animal and infect it. There are many other small biting flies such as *Simulium*, *Phlebotomus*, *Mosquitoes* etc., in addition to the large ones. When it is possible for larger flies to do so, should it not be possible for the smaller flies to carry the disease mechanically? In this connection it is very interesting to note that an outbreak was observed in Mona Remount Depot in December when large biting flies were almost entirely absent. In the middle of August 1922, there was an outbreak of surra in one of the stables in Madras and one of us (L. S. P.) made a special search for large biting flies and ticks and failed to find any. One generally sees that the surra zone is limited to localities and there are certain small biting flies which are also similarly limited to localities during certain seasons. Is it not likely then that these flies limited to such areas may be the real vectors? Work on these lines will perhaps reveal the cyclical development of this parasite which is the cause of outbreaks of surra in the so-called "fly season" or out of it.

Cross and Patel (1921) said that the tick *Ornithodoros crossii* is concerned in the cyclical development of *Trypanosoma evansi* but Yorke and Macfie (1924) of Liverpool who experimented with infected *Ornithodoros crossii* supplied by Cross failed to produce infection in the Laboratory animals. With a view to study if *Ornithodoros* could act as a vector in this Presidency, *Ornithodoros savignyi*, the common tick of the genus *Ornithodoros* of this Presidency was selected for the purpose. These ticks were fed on infected dogs and kept for three weeks when they were fed on rat, dog and calf. These animals did not get infected. Even when a rat injected with blood from the gut of *Ornithodoros savignyi* which was infected five days previously, infection could not be produced in it though the blood from the gut of the tick contained a few well preserved motionless trypanosomes.

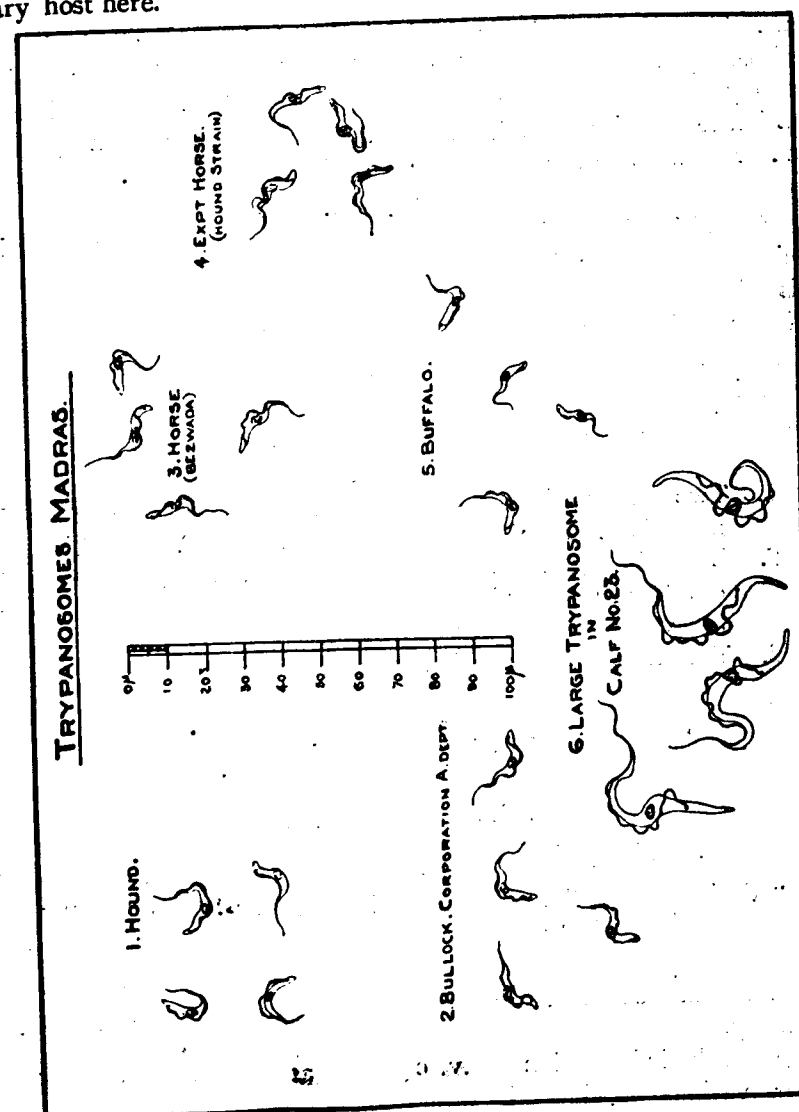
Reservoirs:—Domestic cattle such as buffaloes and bullocks have been blamed to be the animals that harbour these parasites with impunity and that from these the ponies get mechanically infected by biting flies. In the graph of incidence of this disease in bullocks and ponies, one notices that the curves cross each other in July and February. The number of cases in ponies falls whereas the number of cases in bullocks rises. These are the months when flies abound, particularly in February. Two conditions are necessary for the spread of surra:—(1) the transmitting agent and (2) the reservoir. Both these are present in July and February. Why then should there be a fall in the number of cases in ponies is

a matter for speculation. In the month of May, the number of cases in bovidæ touches the zero point. But the curve of cases in ponies rises upto 5. The number of *Tabanus* flies in May is very few or absent. Taking that *Tabanus* is the mechanical vector, this condition in the spread of the disease being absent, what then causes the rise? Some blame the pig and some the dog as the reservoir. In short, we are still simply speculating over these points and more work has to be done.

Kinds of Trypanosomes found:—A small and a large kind of trypanosoma are seen and the small trypanosomes are found in different animals and they seem to vary in size; for example, the tryps seen in the buffalo look smaller than those seen in a horse (vide Camera Lucida Drawing to scale). Similar variations in size are seen in the same animal. The average length of the parasites ranges from 18 to 34 μ and breadth 1.5. to 2 μ . The measurements however tally with those given for *T. evansi*. The study of the morphology of these parasites shows that they are monomorphic. In the monomorphic group of trypanosomes three species with free flagella are mentioned viz. *T. evansi*, *T. equiperdum* and *T. equinum* and no cyclical development has been known in all of these. The two latter species have not been described till now in this Presidency. *T. equinum* is not recorded in India. So, by elimination one can infer that only *T. evansi* is present in this part of India. Strains from horse, dog, bullock, and buffalo were obtained and they are kept going in the Madras Veterinary College Laboratory, in small animals for study. All the strains showed similar characters in their virulence to white rats. In these, each strain showed up in two days after inoculation and by the seventh day the rats died. In guinea-pigs it took about a week to show up and death took place in about 6 to 8 weeks. With a certain amount of reservation, one can say that the "adhesion phenomenon" seems to show that all the strains belong to the same group. Hence one is forced to conclude that all these trypanosomes belong to the same species *T. evansi*. More work still remains to be done.

The second kind of trypanosomes is a very large one and is found in cattle only. This was observed by Messrs. M. R. V. Panikhar and L. S. Parameswara Ayyar in 1928-29 in about half a dozen animals. The first case was a calf in the cattle ward of the Madras Veterinary College. Later, some calves showed the large trypanosomes during rinderpest virus production. The next was a calf at Madanapalle and the last was a cow obtained from a Dairy in Coonoor. It may be that this species was the same as *Trypanosoma theileri*, widely distributed in the Madras Presidency. Usually, these trypanosomes are extremely few in smears and this may

be the reason why they escape notice and not many reports are forthcoming on their existence. It was found that they were not inoculable to the laboratory animals and to dogs but were inoculable to calves. At present it is believed that they are non-pathogenic, but further investigation is necessary and nothing is known about the intermediary host here.



Immunity:—It is difficult to say if an attack of surra confers immunity. In a few cases recovered animals have resisted inoculation with the same species of trypanosomes, while in others it was not so. Frogs may be infected with its natural trypanosomes over and over again. Hoare (1923) has shown that as

long as the sheep were infected with keds, trypanosomes were present in their blood. If keds are removed the infection disappears in a couple of months only to re-appear when the sheep are exposed to keds. It has been observed here that rats treated with Bayer (205) could not be re-infected in three months, but dogs were successfully re-infected after similar treatment and in a shorter time. Thus if immunity is obtained at all it is a very limited one and perhaps the cross-immunity tests for different species may not be entirely reliable for identification of species. Even compliment fixation test as far as is known, is a group test and not a specific test. Hence to determine the species it is rather difficult.

CONCLUSION.

Our object in putting these problems in trypanosomiasis is to stimulate an interest in it. If all those who come across with cases of this disease will collect ticks or any other biting insect from animals and send them to the Madras Veterinary College it would be helpful. The ticks can be sent alive in a pill box and the flies can be put in 70% or even 90% alcohol and despatched. A couple of smears of blood should also be sent if possible.

SUMMARY.

1. Two kinds of trypanosomes are found in domesticated animals *T. evansi* and a large one, perhaps *T. theileri*.
2. Large biting flies alone may not be vectors, the cyclical development may be in those flies that are limited to zones where trypanosomiasis is found.
3. The reservoir of surra is not definitely known.

POX IN SHEEP.

BY

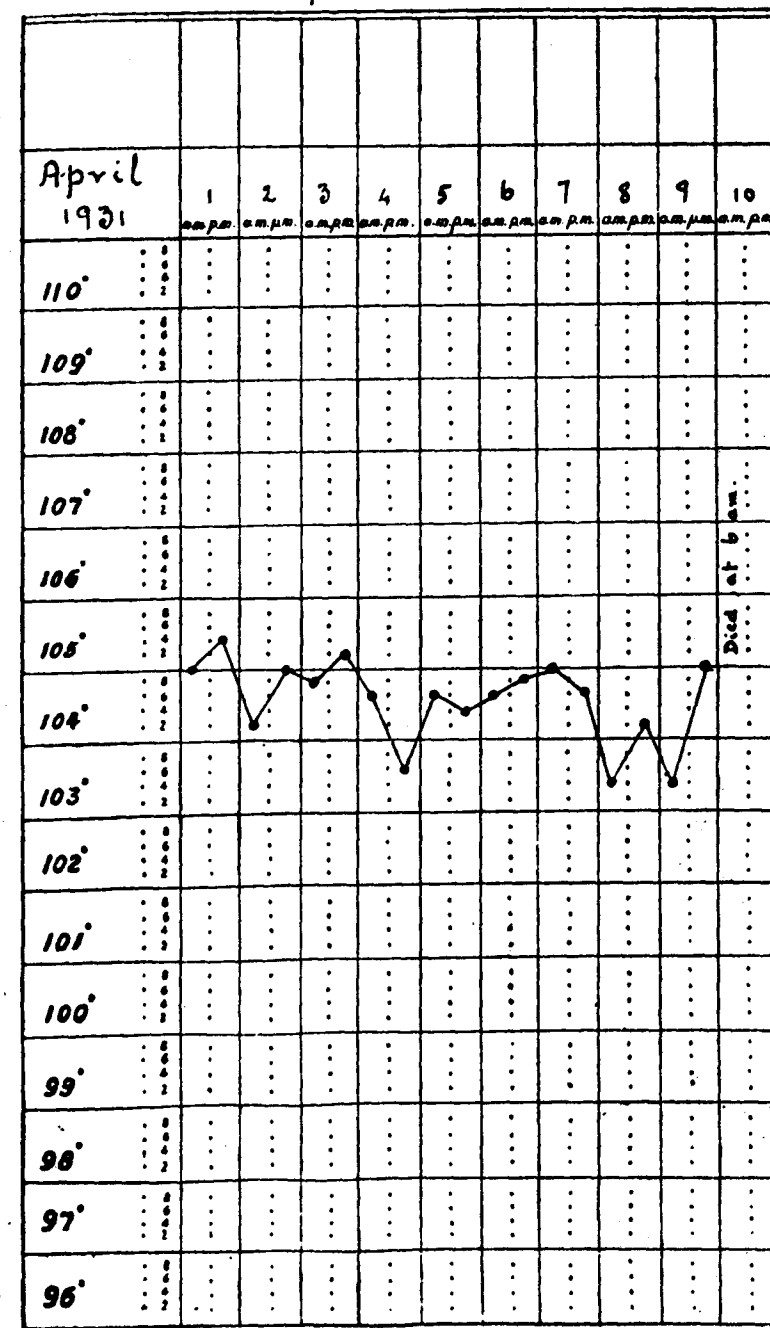
R. G. SATHE, G.B.V.C.,

Veterinary Surgeon, Haffkine Institute, Bombay.

"Variola Ovina" or otherwise known as "Sheep Pox" is a disease of comparatively rare occurrence in India as compared with other parts such as the Southern and Eastern European countries, where it may cause severe outbreaks attended with a very heavy mortality.

From the information I have collected as regards its occurrence in the various provinces it would appear that in India with the exception of Madras, Bombay and United Provinces, no other province has recorded any outbreak of sheep pox so far. In the Madras Presidency though there have been reported outbreaks of sheep pox, yet statistics with regard to the percentage mortality among the affected animals are not available; in the Bombay Presidency there

Sheep No. 14.



has been only one epidemic of sheep pox recorded in the year 1927-1928, when there were only 4 attacks with 3 deaths. In the United Provinces this disease is not commonly met with. However, some outbreaks of the disease have occurred in hilly or submountainous districts with a mortality ranging from 5 to 70 per cent. From this it would appear that with the exception of its occurrence in the hilly or submountainous districts of the United Provinces, sheep pox is not only of rare occurrence but its prevalence is negligible. Its extreme rarity and its non-infectivity are likely to lead one to a wrong diagnosis. I propose therefore, to describe the occurrence of this disease in one of the sheep which was undergoing immunisation for the production of anti-plague serum.

Source of infection:—This animal along with two other sheep has been here for nearly three years under observation and treatment. During the last three years no less than 33 sheep have been under similar environment and in no other sheep has the disease been observed. The only possible source of infection is from sheep which are bought at intervals of a week or more, locally for the preparation of anti-rabic vaccine and it may be that this animal might have contracted the infection from one of them. But this hypothesis is extremely unlikely, as these animals employed for the preparation of anti-plague serum are not allowed to mix with those bought for anti-rabic work.

Although it was one among the three which contracted the disease and lived in close contact throughout the 24 hours of the day the other two have failed to develop the disease even after a period of six weeks. This suggests that the spread of the disease among sheep in India even when they are in close proximity, is extremely limited.

This animal had been undergoing immunisation since 20-4-1928. During this period it underwent in all 112 intravenous injections and 7 bleedings. During its stay the animal gained in weight from 37 pounds to 89 pounds: apparently therefore, the animal was in a healthy condition before it developed the disease. The temperature of this animal had been between 101°F and 102°F under normal conditions.

On 1st April, 1931 this animal had a sudden rise of temperature of 105°F in the morning; it was dull and off feed; usual febrifuge mixture was administered twice a day but the temperature remained between 103.4°F. and 105.4°F. throughout the course of the disease. Blood smears were taken and examined but were found to be negative. As the bowels were constipated an enema of warm water with soap was given followed by a dose of sweet oil. On the 4th day the animal showed eruptions mainly on both the sides of

the chest, abdomen, chiefly round the opening of the sheath, groins and under the tail surrounding the anus. These were seen also in the mouth and buccal membrane and on the tongue, more in the form of ulcers. These lesions varied in size from a gram to a pea and were well raised above the surface and were purplish red in colour. The presence of phymosis was probably due to these lesions surrounding the sheath. These lesions together with a persistent high temperature led me to suspect the animal to be suffering from sheep pox. In order to confirm the diagnosis this animal was taken to Bombay Veterinary College and was admitted to the Bai Sakarbai Hospital for treatment. The case was thoroughly examined by Mr. K. R. S. Aiyar, the Lecturer, Bombay Veterinary College and by Mr. V. R. Phadke, the Assistant Principal of the same College and they both confirmed the diagnosis of sheep pox. I am very thankful to these two officers for their valuable aid in confirming the diagnosis.

This animal died in the hospital on the 10th day from the commencement of the disease.

Post-mortem observations were (1) Eruptions on both sides of chest, abdomen, chiefly surrounding the opening of the sheath and under the tail surrounding the anus. (2) Vesicles over the groins, mouth, tongue and cheeks. (3) Subcutaneous congestion and congestion of muscles. (4) Sub-maxillary glands enlarged. (5) Capsule of the kidney thickened, adherent and presenting many caseating nodules from the size of a gram to a pea in the cortex. (6) Lungs congested, presenting a few patches of red hepatization, and with a few nodules similar to those seen in the kidneys. (7) Trachea, full of froth, mucous membrane congested uniformly right up to bronchioles with many caseating nodules mainly of the size of a gram. The other organs were found to be apparently normal.

CONCLUSIONS.

- (1) Sheep pox is a disease of rare occurrence in India.
- (2) It is not apparently contagious.

I take this opportunity to thank Dr. B. P. B. Naidu, Officer in charge, Plague Research Inquiry at the Haffkine Institute, for facilities afforded and for the permission granted to publish this paper.

OVERGROWN MOLARS IN CATTLE.

BY

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Veterinary Assistant Surgeon, Tiruvannamalai, Madras.

In dealing with the subject of overgrown molars, a reference to the more common condition—sharp molars—will not be out of place. To write in a professional journal that this is a condition frequently met with in horses and cattle, and the simple application of the rasp is all that is necessary to set it right, might appear rather unnecessary; nevertheless, I venture to detail below the conditions met with during a period of over three years in the different stations I worked, and the treatment adopted by me. Sharp molars appear to be co-existent with overgrown molars and in most cases where over-grown molars are operated upon, the rasp invariably comes into play to level down the offending edge of many a faulty tooth.

Overgrown molars appear to be a rare condition in most parts of the Presidency. But, amongst the animals that sought treatment at the institution at Madanapalli from villages within a radius of about 30 miles, during the course of about 18 months when I stayed there, I have observed a good number to be ailing from one or other of the conditions of the molar teeth. That there was anything wrong with their teeth was never suspected, either by their owners or those that treated them in the villages, in many instances. From the observations I have made, it is reasonable to believe that there are more cases of this condition than are really diagnosed and treated. It appears essential to examine an animal's teeth just as carefully as any other part of its anatomy. The term "overgrown" molars is applied when one or more molar teeth stand in a higher level than the rest. A careful look into the mouth of an animal thus affected is all that is required to obtain the necessary diagnosis and the surgeon's skill will do the rest. About 100 cases were treated for this condition during 1928-29 at the Veterinary Hospital, Madanapalli. I have come across a few such cases in Salem, and had about 50 cases here (Tiruvannamalai) during the past one year. The cases met with in the two latter stations were animals well advanced in years, while those met with at the first mentioned station were of all ages, from 4 years upwards.

The last molars of the upper or lower jaw are invariably affected. Any other tooth in any position either on one side or both may be affected too. So long as the teeth are sound and oppose well, the wear is normal and there is no trouble. In some, the teeth are so arranged that the last of the upper or lower jaw is left out of wear, either partially or completely. The portion that does not come into

wear projects and it generally shapes itself into something like a spike and injures any structure that comes in contact with it during the process of mastication. But when any other tooth is seen to project the fault is in the one that is situated directly facing it.

The cases mentioned above are applicable to all animals in all localities. But the reason, for the larger number of animals being affected in (Madanapalli) requires to be explained. The sharp and overgrown molars seen here even in young animals are due to artificial causes. I venture to suggest the following as the probable cause. It is a common practice in this locality to feed growing bulls and working cattle with mature cholam stalks morning and evening for a period of 3 months beginning from October each year. It is what I would call "forced feeding". It is the general belief among the ryots, that to improve an animal's condition, it should be over-fed whether the animal desires to eat or not. Bundles of cholam stalks are brought from the fields freshly cut. One individual sits between two animals and with one stalk in each hand starts forcing it in the mouths, the thickest part of the plant foremost so as to reach the last molar. This process is repeated for a couple of hours daily both early in the morning and at about sunset. This feeding stops only when the man is satisfied; the animals have no choice in the matter.

But why is it at all necessary to adopt this method? Will not animals eat the cholam stalk of their own accord? Yes, they do and will eat. It should be quite natural for them to prefer the fresh cholam stalks to the coarse dry straw on which they have to thrive during the long summer months. But it should be remembered that at the period when they are fed in this way, the animals are completely off work. They have only to masticate and digest the large quantities of this green fodder thrust into their mouths. Naturally their appetite gets dull and are quite disinclined to consume the quantities that the owners desire them to, specially when it is the same stuff day in and day out, without any grain or other variety to relieve the monotony.

The last two molars being compelled to grind the thickest part of the cholam plant both morning and evening for a fixed period every year, any small irregularity in their opposing surfaces is aggravated, unevenness in the wear is increased, resulting in the condition described above. This also accounts for the many cases of sharp molars, weak masseters due to over-straining, apart from the repeated attacks of indigestion, tympany, diarrhoea and more often injuries to the throat.

Symptoms:—An animal with overgrown molars does not show any symptom until the irregularity is so great as to begin giving pain and inconvenience to the animal, while masticating dry fodder,

It is not possible to see anything wrong with such an animal when fed on green grass. It is remarkable that animals with very badly affected teeth get on for considerable periods without any apparent trouble and can be made to attain good condition and be sold in public markets as really good ones. The train of symptoms described below become noticeable only at the time they are fed upon dry fodder.

To begin with, the feeding is slow and the quantity consumed decreases gradually. The sounds of normal vigorous mastication are absent. Mastication is slow and is cautiously carried out and is restricted to particular parts of the mouth. The animal chews and chews, sucks in the juice and spits out the rest at different stages of mastication "quidding". A number of these half masticated "cuds" will be found wherever such animals are tethered and a diagnosis can be easily made even without seeing the animal. This occurs where the last molars are badly affected. When such animals masticate, a peculiar sound is heard which can be readily made out as differing from the normal and pointing to a defective condition of the teeth. There is a flow of saliva from the mouth in some cases. Rumination is slow and is carried out at repeated short intervals. When any teeth other than the last ones are affected the "quidding" is not continuous nor is it a constant symptom. There is accumulation of half masticated food particles between these teeth and the cheek. This increases in size and becomes so hard that it can be very easily mistaken for a tumour. This is a very common sign and may be considered characteristic of overgrown molars at the sides. In one instance this accumulated mass was so situated that it not only obstructed the flow of saliva from the duct into the mouth but made it possible for the food particles to find their way into it. The duct was considerably distended and when opened contained a large quantity of fine particles of straw etc., many of which were forming into calculi with white layers collecting around them.

It is unnecessary to mention that animals with overgrown molars will be losing condition gradually.

Treatment:—Many are the modes of treatment to which these animals are subjected to before they come to a Veterinary Hospital. Some are dosed with drugs of different kinds for varying periods. But those that have the misfortune to be attended to by quacks who combine surgery to their knowledge of medicine suffer most especially when anything wrong with their teeth is suspected. "Salipallu" i.e., chill in the tooth, is the term applied to any kind of tooth trouble. To remove that chill, heat should be applied and this is applied simply and directly. Twigs of Madar plant (*Calatrosis gigantea*) or suitable iron rods are heated, thrust in between the molars and blistering or branding is carried out externally.

A look into the mouth of the animal settles the treatment. To cut the projecting teeth suggests itself and is easily done.

Operation:—The operation is easily and conveniently done, with the animal standing. The mouth is held open by means of a gag and with the tooth cutter the offending tooth is chipped off. The cut portion drops down or it should be removed by hand. The rasp is then applied to level down any sharp or irregular edge and the operation is complete.

Instruments and appliances:—Of the three kinds of mouth gags tried by me, the perfectum mouth gag speculum, with screw arrangement to open its jaws, appears to be the most convenient. It is easily applied, causes no injury or inconvenience to the patient and is perfectly safe for the operation.

I have used two kinds of tooth chisels, one of sharp and stout steel with a blade moving up and down in a small space. This is not of much use in this operation. To cut a good sized tooth it requires prolonged application which is tiresome both to the patient and the operator and the result is uncertain. It is likely to shake the tooth to its very root if applied too forcibly. The second chisel is of two parts that can be screwed on to one another. It is long and provides plenty of room for hammering. But it cannot be used in certain cases where the tooth affected is the last molar or those that cannot be held by this instrument. But with the molar tooth cutter, the operation is complete at once and the relief obtained is immediate in most cases. A second look at the animal is not necessary unless it is for the application of the rasp which might not have been used effectively at the first instance. Sometimes, it needs the strength of two men to bring the jaws of the cutter into good effect when confronted with a big tooth. In cases where a molar is worn to such a fine point that it cannot be held by the cutting surfaces of this instrument the blunt edge of the rasp or a piece of iron resembling a chisel is useful to knock off the projection.

Clinical Articles

OPERATION FOR MUCOUS POLIPI IN A C. B. PONY

BY

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Professor of Surgery and Obstetrics, Bihar and Orissa Veterinary College, Patna.

A. C. B. roan pony belonging to one Lachaman Gowalla was admitted in the hospital with the following history:—

The pony used to pull a trap; suddenly one day he slipped and fell, knees were badly injured and some abrasions occurred over other parts of the body. Sometime afterwards it was found that a mass has protruded out of the anus.

Thinking it to be a prolapsed rectum he took it to somebody who attempted to reduce it but having failed advised it to be taken to the College hospital.

State of the animal on admission:—The animal looked dejected, back was arched and temperature slightly above normal. A careful examination of the protruded mass revealed that about twelve pieces of growth highly vascular in appearance and partly covered by dead tissues have surrounded the rectum and protruded out of the anus and due to rough handling, also the pony having rubbed it against walls, etc. has lacerated them badly and the whole mass looked something awful.

Treatment:—After casting, an examination was made and it was decided to amputate them separately. Accordingly each protruded piece was, one by one, secured, ligatured with silk thread and snipped off and the anus returned to its normal position.

The animal made an uneventful recovery in the course of a week.

Histological examination of the prolapsed mass:—Mucous polipi. They are very rare.

REMOVAL OF A PORTION OF UTERUS

BY

G. N. ROY CHAUDHURI, G.B.V.C.,

Professor of Surgery and Obstetrics, Bihar and Orissa Veterinary College, Patna.

On 31st October, 1931, a C. B. cow was sent to the College hospital.

The history of the case was that the cow calved a week back and on the 2nd day of calving prolapse of the uterus was noticed. Attempts were made to reduce the prolapsed mass but every time it was a failure.

Condition when admitted:—The general condition of the cow was good. The prolapsed mass was about 14 inches long and gangrene had already set in at various spots. The edges of the vulva were lacerated at many places perhaps owing to bad handling. The whole of the protruded mass was looking very unhealthy and dirty. The animal was in great pain and was straining violently.

Treatment:—The protruded mass was thoroughly irrigated with cold water, the gangrenous portions scraped and removed as far as possible, washed with a non-irritating antiseptic lotion and reduced. A thick pad of cotton wool soaked in antiseptic lotion was then pushed in as a plug, rope truss put on and a dose of Chloral administered. But the straining continued and the cow threw out the mass again and again and having found no way to keep it in position, amputation was decided on.

Technique:—After casting, the surface of the protruded mass was thoroughly cleaned and care was taken to discover by palpation that no portion of the bowel or bladder was included in the inverted portion.

A rubber tubing of average size thoroughly disinfected was applied as high up as 12" from the bottom of the protruded mass and fastened tightly.

A 4% cocaine solution was injected at different places and when the anaesthetic had acted the whole mass was removed from an inch below the tourniquet by means of a curved bistuory. The removed mass weighed over 4 lbs.

The part was then thoroughly washed with antiseptics and reduced. Daily dressing and irrigation were carried on.

After a week the ligature fell off and the wound was healthy and was dressed regularly. The animal lived over a month and a half.

Then suddenly she developed a temperature and died in 3 days time.

A. P. M. revealed that a portion of the placenta retained inside the uterus got septic and caused death; an examination (before operation) of the uterus could not be carried out as the os was unusually contracted and did not allow the passage of even two fingers. Also the assurance that the placenta was removed by the attending surgeon stopped us from dilating the os.

It is found that local anaesthesia is better in this kind of cases than a general anaesthesia.

A PECULIAR CASE OF ABNORMAL EGG FORMATION

BY

B. B. JOSHI, G. B. V. C.,

Veterinary Assistant Surgeon, i/c Veterinary Hospital, Poona.

Abnormal eggs are of two kinds—those with more than one yolk and enclosed eggs (ovium in ovo.) Double yolked eggs are obviously due to the simultaneous or almost simultaneous liberation in single set of egg membranes. The two yolks are usually separate in such cases and are derived presumably from separate follicles. But two yolks within a single viteline membrane, have been observed. Such are in all probability products of a single follicle. Cases of three yolks within a single shell are extremely rare. The class of enclosed eggs includes those in which there are two shells, one within the other. There are different cases. (1) Those in which the contents of the enclosed and the enclosing eggs are substantially normal, though of course the enclosing shell is absolutely large. (2) The enclosed eggs may be normal as to size (small yolk) or content (no yolk). In all cases described the enclosing egg possesses a yolk. Abnormal eggs of those three classes are of either ovarian or ovidueal origin; double yolked eggs and eggs with abnormal yolks are due to abnormal ovarian conditions and enclosed eggs are due to abnormal ovidueal abnormalities. Assuming the normal peristalsis of the oviduct to be reversed when a fully formed egg is present, the egg would be carried up the oviduct a greater or less distance and might there meet a second yolk. If the peristalsis became normal again, both would be carried to the uterus and enclosed in a common shell.

The case referred to, in this article was a peculiar one. It was in the month of February last that we had an imported white Leghorn hen sent to us for treatment with the following symptoms:—a hen very heavy in the abdomen unable to walk; on palpating the abdomen symptoms of dropsy were noticed; a dose of calomel was given and the owner was advised to bring the hen the next morning but unfortunately the hen died the very evening. The owner brought the carcass for P. M. examination. On opening the abdomen, to our

great surprise we found a big egg without shell, as big as a cocoanut, in the abdominal cavity instead of any watery accumulation. We removed the egg quite intact and separated the membranes very carefully and counting them, we found 11 separate membranes each one with an embryonic spot on and ultimately the yolk. The whole egg weighed 20 ounces—membranes 14½ ounces and the egg itself 6 ounces. The tape measurements lengthwise and breadthwise showed 10 x 8½". The ovaries did not show any peculiar abnormalities nor the oviduct; other viscera appeared normal.

The fact that the egg was found in the abdominal cavity and nothing particular was noticed in the oviduct, goes to show that this egg formation may be due to ovarian abnormalities and that if laparotomy had been performed in time the hen might have been saved.

CANCER OF THE EYE IN CATTLE.

BY

K. S. PILLAY, G.B.V.C.,

Civil Veterinary Department, Mysore.

A puzzling sort of neoplasm affecting the eyes of cattle seems to be common in this State. As far as I have seen, it seems to affect only the working bullocks and cows that are sometimes yoked. From the clinical point of view, it is called by the vague term of *cancer* in these parts rightly or otherwise.

Etiology:—There appears to be little literature dealing with this particular disease, excepting some clinical cases reported which may not take us up nearer the truth. From a paper read at the All-India Veterinary Conference, recently held at Bangalore (Mr. K. J. Subramaniam, G. M. V. C.), *Filaria lachrymalis* is supposed to be an exciting cause. But I have not got any evidence to corroborate this probability, though many cases have passed through my hands. From the history of cases and from the observations made in the dispensary, I could gather that the affected animals had profuse lachrymation of the affected eye to begin with and about six months later, a sort of granules begin to appear and they continue to grow to the very last. The fact that it occurs only among those bovines that are working under a yoke is of some interest.

Symptoms:—The onset is characterised by a mild conjunctivitis associated with lachrymation of one eye and invariably only one eye gets affected. It is only reasonable to assume that this may be due to the fact that the eye which comes in contact with the yoke is predisposed to the neoplasm. Itching sensation sets in and the

poor bull gets the tendency to rub the eye against any hard object that comes in its reach, thereby aggravating the symptoms. In about 4 to 6 months reddish nodules make their appearance either in the membrana nictitans or any other part of the conjunctiva.

The nodules take up the shape of granules and keep growing over almost the whole of the mucous membrane. Often small cauliflower like growths are found on it, and such generalised forms are not uncommon. Much swelling and complete closure of the eye lids result in about another three months. Then a discharge of pus of a very offensive odour begins which attracts flies and fly maggots may often be seen on it. The eye ball due to the pressure of the growth gets sunk deeper and deeper and at the same time degenerates. If an eye is examined a year or so after the commencement of the symptoms, little or no trace of the existence of the eye ball can be detected. It does not stop there, but goes on attacking all the structures of the orbital fossa, the periosteum, orbital plates, and finally infects the cranial cavities of the affected side. In later stages, progressive emaciation supervenes and the poor loathesome creature succumbs to secondary causes.

Duration:—The average duration is proved to be anywhere between 2 and 5 years.

Infectivity:—Very often than not animals of excellent condition working under a yoke get it. Young animals under workable age are not seen getting it, which again makes me think that the yoke has something to do with it. Though it has got its special characteristics regarding the microscopical appearance, course, etc., the remarkable feature is that it does not seem to possess the contagious properties in the ordinary sense of the term. An affected animal, remaining in the same shed, and moving about with the rest of the animals for months and even for years together has not been traced out to be a source of danger to its companions. The sanitary conditions, the number and varieties of flies, fleas, mosquitoes, ticks and the like in a village cattle shed are too patent to need any description. These insects appear to be quite incapable of transmitting the cancer.

Treatment:—The only routine treatment was to remove the eye ball and try to heal the part. I have tried many kinds of caustics and some sort of quaint nostrum like the application of a paste of leaves of the custard apple etc, without any benefit. Internally various drugs have been tried and were of no avail.

I request the many readers of this journal to kindly publish their experience with such conditions for the benefit of the rest.

AN UNNATURAL PHENOMENON

BY

A. B. AGETE, G.B.V.C.,

Veterinary Assistant Surgeon, Islampur, Bombay.

Subject:—A buffalo-calf, born on 23-4-31, in a village two miles away from the dispensary, was brought for treatment the next morning for imperforate anus. The sons of the owner, barbers by profession, tried to make an opening at the seat of anus by the instrument (Nachkan) by which nails are removed. But the father prevented them from doing so, as he thought, it could be done well at the dispensary.

History.—The following history was related by the owner. The calf had not passed either urine or dung since its birth. It was not sucking the mother and the constant straining attracted his attention to find out what the matter was, and to his astonishment, he found that the poor calf had neither the anus nor the generative organ, either male or female.

Examination:—I examined the calf and found both the generative organs absent as described by the owner. I was also struck particularly to find the tail which was very short like that of a goat. Four teats were present in their natural position, but in a rudimentary form. I therefore came to the conclusion that the calf must be a female one on account of the presence of teats and the absence of male generative organs.

Treatment:—Operation for Atresia was first taken on hand, the necessary instruments having been previously sterilised. The part was washed with soap and water, dried and Tincture Iodine applied. The skin at the seat of operation was dissected with the connective tissue. It was then found that the intestinal tube terminated in a blind end. It was punctured and the contents rushed out. Soap water enema was given and thus the rectum was emptied. The end of the bowel was then sutured with the edges of the skin and a suitable dressing applied to the wound.

Secondly a slit was made to see whether the genitals are hidden under the skin, but nothing was found. The wound was sutured and dressed with Boro Iodoform along with the first one, after puncturing the bladder with Trocar & Cannula for the removal of urine. (Cystocentesis). Rubber tube was not kept as I learnt from the owner that sometimes urine is passed through the rectum after the puncture of the bladder.

Internally oleum recini was given and a little vaseline was also supplied for application to the opening.

2nd day:—Sutures were found to have given way due to rough handling by the owner. Gave an enema as the bowels did not act. Wound was washed clean and dressed with Boro Idoform; internally repeated castor oil.

3rd day:—The same as above.

4th day:—The owner informed that the calf had motions and passed urine through the rectum and sucked the mother. Repeated the dressing.

5th day:—The same dressing and treatment as on the 2nd day.

6th day:—The calf was uneasy and therefore the owner did not turn up. It died at 1 P.M. Post-mortem examination was conducted and the following was the interesting finding:—

All the organs normal. Uterus was absent and there was no trace of either male or female generative organs.

CHOKING IN A BULLOCK

BY

N. RAMANADHAN, G.M.V.C.,

Veterinary Assistant Surgeon, Adoni, Madras.

*Subject:—*Bullock, Mysore breed, aged about 9 years.

*History:—*The animal was seen eating pieces of bone by the owner in the morning. The animal refused food the whole day. Local quacks were consulted about the complaint, but they could do very little to alleviate the suffering of the animal. About a week passed by and the animal grew worse. The animal was brought to this institution for treatment on the 8th October 1930, and according to the statement of the owner, the restlessness of the animal was observed on the 1st October 1930.

Condition of the animal when admitted in the hospital was very weak, listless, parotid region highly inflamed, breathing laboured and stertorous followed by occasional cough.

*Treatment:—*As the patient was very weak, it was made to stand against a wall supported on either side by two attendants. Mouth gag was applied and a well lubricated probang was passed into the mouth to note the seat of obstruction. At the upper third of the oesophagus resistance was felt and the seat of obstruction was located and lubricated through the probang. All attempts at massaging the part externally in order to dislocate the obstruction proving unsuccessful, the probang was passed and by the application of a gentle force, the firmly inbedded bone was dislodged. The animal was then watered and thus the obstructing material was

pushed into the rumen. The throat was gargled with warm alum and pot. permanganate lotion. Liniment was applied externally after fomentation.

Cough electuary was prescribed and salted warm gruel constituted the nourishment of the patient. This treatment was continued for a week and the patient was discharged cured on 15-10-1930.

A FEW INTERESTING POST-MORTEM FINDINGS IN DOGS

BY

M. V. PILLAI,

Assistant Municipal Veterinary Surgeon, Penang.

1. Unilateral Hydro-nephrosis.

*Subject:—*An old brown dog, admitted for treatment at the animal infirmary on May 6, 1931.

*Symptoms:—*The animal had considerable enlargement of the abdomen, difficulty in respiration and extreme emaciation and weakness. Examination of a drop of blood from the auricular vein, revealed nothing unusual. From enquiry made from the owner, I gathered that the animal was in this condition for over a fortnight.

*Prognosis:—*Seemed to be very unfavourable at the first sight. But to relieve the dog of its difficulty in eating, abdomen was punctured by means of a Trocar and Cannula and 3 pints of clear fluid removed; and to keep up the strength, a stimulant mixture was also given. The animal had some milk, white of an egg and a teaspoonful of brandy in the evening, which it took very eagerly. The next morning the animal was found dead as anticipated. The following were observed on *post-mortem* examination:—

(1) Abdominal cavity was filled with a clear fluid.

(2) All the internal organs were pale.

(3) Right kidney was enlarged.

(4) A careful search was made for the left kidney, which appeared like a big bladder containing 3 ounces of brownish fluid. This was diagnosed with the help of the book "The Diseases of the dog by Muller and Glass" as a peculiar condition in which the kidney becomes unusually distended with urine, which is unable to pass freely along the bladder consequent upon the obstruction of that channel. This condition is known as "Unilateral Hydro-nephrosis".

2. SARCOMATOUS GROWTH ON THE PROSTATE GLAND

The subject in this case was an old Fox Terrier dog, sent by the owner—the President of the Municipality, to have it painlessly destroyed. The animal had a soft enlargement at the perineal region extending up to the point of the buttock at the right side. Out of

curiosity, I manipulated the part and the animal did not feel any pain. The gait of the dog was very peculiar and straddling and urination was imperfect. The animal was destroyed after some time, but when an examination was made at the perenial region, a big lump of growth, probably of sarcomatous origin was found on the prostate gland, weighing about 8 ounces.

Cases of the above type are rarely seen in dogs, unless one takes a great interest in making post-mortems of animals that die at the Animal Infirmary.

3. STONE IN THE BLADDER.

This was another interesting case in which the subject was a middle aged bitch admitted for Haematuria, on 19-10-30. Symptoms of dullness, off feed, staggering gait and arched back were noticed in the dog.

On manipulation of the bladder, the animal evinced much pain and passed a few drops of urine tinged with blood. The bladder also was hard to the touch. As prognosis seemed to be very unfavourable and the diagnosis imperfect, nothing could be done by way of treatment, except a warm water enema and hot fomentation on the loins. The animal died the same night. Post-mortem revealed one solid round hard stone of a yellowish white colour in the bladder. The muscles of the bladder were found to be thickened, and the mucous membrane highly inflamed and in certain places gangrenous.

ODYLEN IN DISTEMPER PUSTULES.

BY

J. D. SAMPATH KUMARAN, L.V.P.,

Civil Veterinary Department, Mysore.

A tiger cub was brought to me with distemper of pustular type. Our routine ointment with Creosote, Zinc Oxide and Mercuric ointment was applied for over a week, without any improvement in the condition of the cub. I desired to try Omnadin recommended by Messrs. Bayer-Meister Lucius. Unfortunately, I could not get this from the local market but I had a sample bottle of Odylen kindly supplied to me by their representatives Messrs. Haverro Trading Co. Ltd.

This was applied for three days and the cub recovered within a week. Salicin was also administered orally before.

Later, I had two cases of pups with pustular type of distemper and two applications of Odylen resulted in complete cure. I am now using Odylen in most of my cases when the owner could pay for this product.

NATURE'S PECULIAR CREATION.

BY

K. S. NAIR, G. B. V. C. (BOM.).

Assistant Municipal Veterinary Surgeon, Singapore.

No body in the world has ever succeeded in competing with Nature in all her creations. Nature herself is the greatest doctor and the greatest anatomist. Here is an example of the work of Nature which no anatomist can imitate or make. The animal in question is a 7 year-old Malayan he buffalo belonging to the "Great World."



On 4-6-31, I was requested by the management of the Zoological Section of the "Great World," Singapore, to examine this animal and to say whether it was cruel to exhibit such an animal in a public show.

The above photo shows that the animal possesses an extra fore leg hanging from the anterior part of the sternum with all the anatomical features of normal fore leg, except the scapula bone. The additional leg is free from any function. The head of the humerus and the sternum are connected with a cartilaginous attachment.

As this is a peculiar creation of Nature, rarely seen, I think, it would interest the readers of this valuable journal.

[This must evidently be a case of Teratoma. Ed.]

Notes.

In the proceedings of a Laboratory Meeting held at the Royal Army Medical College, Millbank, London, held on 19th March, 1931, Mr. Wenyon mentioned about successful infection to the dogs with *H. Canis* by inoculating them subcutaneously with an emulsion of infected ticks obtained from Baghdad. Two dogs were inoculated and they showed the parasites on the 35th and 37th days respectively. (Vide Vol. XXV, No. 1. Transactions of The Royal Society of Tropical Medicine and Hygiene.)

We are glad to note that this corroborates the work of Mr. M. A. Rao, Madras Veterinary College, done in 1924 and published in the Indian Veterinary Journal, Vol. 1, Page 238.

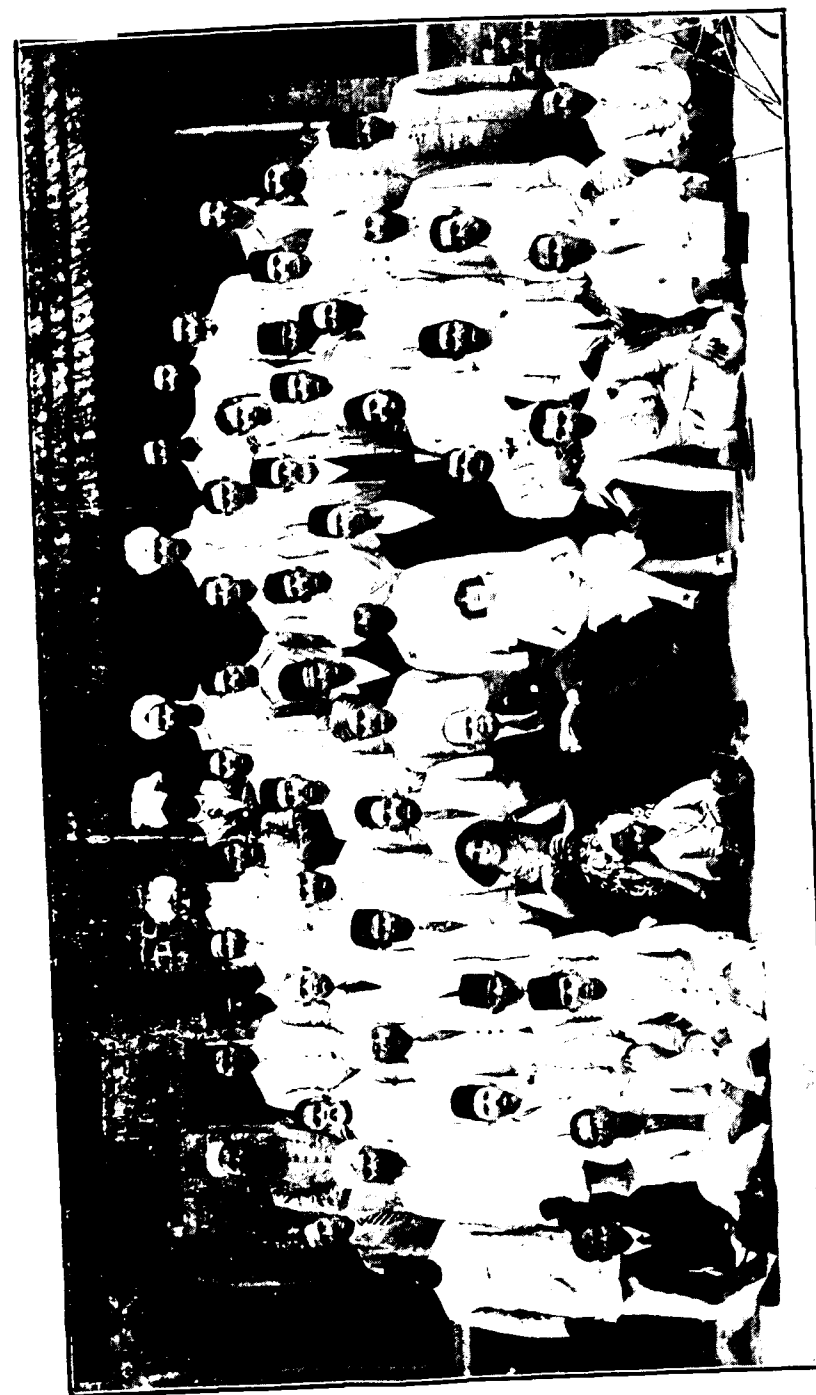
We have been receiving bitter complaints against what some have described as "atrocious proposals" under consideration of the several Local Governments, in the name of retrenchment. We wonder if any retrenchment could be effected in the Veterinary Department without seriously affecting their efficiency!

Efficiency! Who cares for it? It is merely a catchword oft repeated to hoodwink the lay-public and satisfy a few of the inconvenient members of the Legislative Council.

Is it not a notorious fact that the Veterinary Departments all over India are "under-manned" and "under-paid." Even the Agricultural Research Council has said that. What then can an ill-paid and ill-fed man be able to spare without giving up his very necessities of life? Will that be conducive to efficient work? Devitalised and disgusted with life, he will be unfit for any work.

Instead of such proposed harassment of an already ill-paid class of public servants, we would give a tip to the Government if they care to take it. Better close the whole department! What a saving that would be! Will they do it?

No; an emphatic 'No', for reasons which we do not wish to discuss here. We can only say that the demand for veterinary aid in rural areas is daily on the increase and there is a pronounced dissatisfaction on the part of the ryots at the meagre provision made to



The 11th Veterinary Conference of the United Provinces Veterinary Association held at Lucknow, on the 4th & 5th April, 1931.

safeguard their cattle-wealth. Even if that is affected through retrenchment, we venture to say that the result will be disastrous so far as the feelings between the ryots and Government are concerned.

* * * *

When will the Government realise that the ryot is made poorer day by day—a veritable pauper—through loss of his cattle even from preventable causes? The ryot of to-day is able to understand which is which. Retrenchment of any nature in the Veterinary Department will only be penny-wise and pound-foolish.

* * * *

City and teaching allowances are either to go or to be reduced drastically! We can claim to have a hand on the pulse of those to be affected. We dread to describe their state of feelings. We hope that wiser counsel will prevail and that the miserably paid Veterinary Department will be spared from the "Poll-axe"; for it will only prove that if applied.

* * * *

Another queer news comes to us. They are thinking of placing the Veterinary, Agriculture and Cooperative Departments under a single Director! Need we say that it will only hasten the day of complete ruination of the concerned departments! Verily none are so blind as those who do not want to see.

* * * *

The Government of Bombay has published "a Review of the Veterinary Department" in that great Western Presidency (April, 1931), which is published elsewhere in this issue of the journal, for the information of our numerous readers in India and outside. We have no hesitation in saying that a review of this kind was long overdue. The circumstances under which this review was prepared and published, have been clearly set out in the first para of this important document. It is in fulfilment of a promise made in an announcement by His Excellency the Governor in his speech to the Legislative Council on the 17th February 1930. With the laudable intention of the Government to examine the whole administrative machinery in order to ensure that it is working efficiently and economically and that it is designed to meet the present day requirements, a Review of each of the Government Departments was undertaken by the Government of Bombay. It is also stated that this Review of the Veterinary Department has been prepared and published in order to obtain views and suggestions before the overhauling of the Department is undertaken. How we wish that the Veterinary Departments in the other Provinces in this country would follow this worthy example.

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The Review contains four chapters, the first one dealing with the present organisation giving a brief sketch of the functions of the department in the Presidency proper, in Bombay City and Port and in Sind. The functions of the department in each of these three parts, as given in the Review, are very important and it will be seen that, the staff, to discharge these functions is very inadequate. When we commented, in the last issue of *this Journal* on the proceedings of "the Bombay Subordinate Veterinary Service Association", we had not this valuable Review before us. But from what we knew then of the C. V. D., in Bombay, we said then "that the first Veterinary College in India was started in Bombay about half a century ago and Bombay was also the first to organise a Government Veterinary Department in this Country", and we deplored the fact "to-day it is such a Bombay which is backward in the Veterinary matters".

Chapter II deals with the "co-ordination with the other departments". While giving the credit to the Revenue and Agricultural Departments for the help extended by their officers to the working of the Veterinary Department, the Review rightly concludes with an appropriate suggestion under "Co-operative Department" as follows:- "In this connection, the officers of the Co-operative Department can be of great assistance in controlling breeding operations and in improving the stock as it is to them that the agriculturists appeal for help when purchasing bullocks". We heartily agree in this suggestion.

The third chapter deals with the defects of the present system and proposals for improvement. Therefore this is the most important of all the chapters. The Review readily admits "the undesirability of having three distinct departments dealing with the Veterinary work" and the defective organisation of each of these three. Prominence is properly given to the shortage of staff and dispensaries. Though this defect is common to almost every British Indian Province and Indian State, still we have no hesitation in saying that Bombay Presidency is one of the greatest sufferers, if not the greatest sufferer, from this defect. The inadequacy of the present staff to meet the normal needs of the Presidency has been admittedly realised for some time past. But why no serious efforts were made to increase the staff as is in the Co-operative and other nation building departments, is not known. Let the past bury its dead! There has been no appreciable addition at all to the superior staff since the inception of the Department in this Presidency, though other departments in this Presidency and even the Veterinary

Departments in the other Presidencies in India have considerably added to the superior staff to meet the increased needs. Who is responsible for such a state of affairs in this oldest Presidency? We shall not wait for a reply.

Since the Review gives out the main defects with a view to remove them, we shall not weary our readers with their repetition in detail here. In the matter of providing the necessary subordinate staff to meet the growing needs of the country, we have no hesitation in suggesting to the Government of Bombay to adopt the good example of its more advanced sister Presidency of Madras, which has been steadily pursuing the laudable scheme of providing a touring Veterinary Assistant Surgeon and a Veterinary Institution in charge of a Stationary Veterinary Surgeon for each of her taluks, out of the State Funds. From our knowledge of the working of the Veterinary Departments in the several Provinces of this country, we have come to the conclusion that the State should not leave this important economic work of safe-guarding and improving the live-stock of the country to the slender resources of the poverty stricken Local Boards and Municipalities and Madras Government has done well in taking up this responsibility on its shoulders, relieving the Local Boards of their burden in this respect. Therefore, we heartily recommend the Madras scheme for adoption in Bombay.

We do not envy Sind for the favour shown to it in the Review with the suggestion that there should be "legislation for the compulsory treatment of contagious diseases and control of the movements of cattle", as otherwise the work which is being done by the small staff of Veterinary Assistant Surgeons will be of no avail to stem the progress of the disease. We hope this suggestion will be soon followed and Sind will have the fortune of leading other Provinces in this important respect. In the meanwhile will it be too much for us to expect the other Provinces to take up this valuable suggestion and work up? In the present poor economic condition of the Indian ryot, we doubt the wisdom in the suggestion that small charges might be made for services rendered to individuals.

Under the important item of "Recruitment", the Review considers that two of the proposed three Deputy Directors in the Presidency excluding of Sind and the proposed Deputy Director in Sind should be Class 1 Officers and suggests that the service of experienced officers will have to be obtained temporarily until suitable recruits can be obtained for posts in Class I and Class II of the

Provincial Veterinary Service. We condemn this proposal that the Army Department might be requested to second to this Presidency two or three Veterinary Officers with administrative experience on the imaginary difficulties in the early stages of the reorganisation of the Department in getting experienced hands from amongst the present staff. In this connection, we should tell the authorities that the Indian Veterinary Profession has in its midst many members who have proved their capacity both for administrative and professional work. It is only the imaginary fear of the heads of the Veterinary Departments which has been responsible for the present small number of Indian Superior Officers in this unfortunate Department.

* * * *

Wherever and whenever the Indian Veterinary Graduate was given equal opportunities, he has proved in the past that he is capable of administering and doctering efficiently and we have no doubt he will prove to be so even in greater degrees in the future than in the past. In the sister Presidency of Madras and elsewhere, where Indian Subordinate Officers were given opportunities and promoted to the superior grades, they have proved their efficiency as testified in the Administrative Reports (Departmental). We refuse to believe that the experienced Subordinate Staff of the Bombay C.V.D., cannot supply sufficient number of men to fill up the posts in Class II. In the majority of the other Provinces in India, to-day most of the Provincial Posts of Class II are held by the Bombay Veterinary Graduates, because they are the Pioneers who carried the Veterinary aid into those Provinces. The younger Veterinary Colleges have also produced many Graduates who have been very creditably holding the appointments in Class II either as Professors or Lecturers in Colleges or as Provincial Service Officers. Similarly if to-day a sympathetic and just view is extended to the Bombay Graduates in service there, we are sure there will not be a necessity to regret this step. The claims of the Indian Graduates for superior posts are long overlooked. In the Bombay Presidency practically there have been no opportunities for its Subordinate Civil Veterinary Officers to rise to the Provincial Cadre.

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We strongly suggest to give up the idea of appointing costly Deputy Directors to the charge of large areas correspondent to the Revenue Divisions. Instead, District Veterinary Officers for smaller areas, as in Madras, may be appointed, promoting the suitable men from among the Subordinate Staff. This step has many advantages, besides doing justice to the deserving subordinates. At present the Inspectors in Bombay C. V. D., are doing the work of Deputy

Directors except sanctioning casual leave and signing pay bills. They along with their Veterinary Assistant Surgeons are the pioneers of the Veterinary Service in that vast Presidency. They have organised this Service as it exists to-day creating a demand for Veterinary aid and obtained donations for buildings of Veterinary Institutions. If an officer of the Army Department is seconded to this C.V.D., he cannot freely mix with people. He will not know their language and needs. The Department unnecessarily becomes top-heavy with the costly officers of Class I on a salary ranging from Rs. 350 to Rs. 1000 with the addition of over-seas and other allowances in these days of retrenchment. This can be avoided by appointing District Veterinary Officers with suitable powers, in the place of present Inspectors.

* * * *

It is curious to know that only in the Veterinary Department the cry is heard, that suitable candidates are not available among the Indian Veterinary Graduates, to hold superior posts whenever a necessity arises to appoint men for such posts. The Indian University or College Graduates have successfully held Provincial and Imperial posts in Agriculture, Revenue, Co-operative, Medical and all other Departments. They have been Collectors, Ministers, Executive Councillors, and High Court Judges. But the Indian Veterinary Graduate is not considered by the Heads of the Departments, fit to hold posts in Class I or II in the Civil Veterinary Department, even in the few chances that may become available! Why this disparity in treatment given to the Graduates of the Indian Veterinary Colleges is a puzzle to many. It cannot be said that the Heads of the Civil Veterinary Departments and Colleges have not been able to give the necessary training in the Indian Veterinary Colleges to fit the Indians for high posts in the Veterinary Service. Medical, Engineering, and posts of other professional and Arts Colleges have been able to train the Indians for higher posts. How the Veterinary Colleges alone have failed in this respect needs sufficient explanation. With all the existing disadvantages and cramped up courses, the Indian Veterinary Colleges have produced sufficient number of men of whom any best educational institution can feel proud. Only encouragement and opportunities are required to prove their capacity.

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The paragraph under "Research" recognises the necessity for investigation and research into animal diseases and attaches much value to these improvements to the College. Financial stringency again should not stand in the way of effecting this improvement.

If necessary, the construction of a tank or a bridge should be given up to find funds for providing the necessary investigating and research staff and buildings, because a bridge or a tank will benefit the people of the locality, whereas investigation and research into diseases of animals will benefit the whole country.

The remarks in the paragraph under "Animal Husbandry" have our hearty support.

Under the heading "Control" it is suggested that the three different Veterinary Departments in the Presidency should be kept under the sole control of a Director of Veterinary Services as in Madras. This is a good suggestion.

The fourth chapter summarises the suggestions. In the foregoing paras of this notes we have given our views on many of these items. We emphasize the necessity of affiliating the Veterinary College to the Bombay University, as suggested in the Review. This important step is long overdue, and it has been pressed on the attention of the authorities from time to time. Madras is already moving in this direction. Let Bombay follow suit is the cherished hope of all the people who have the good of the Indian Veterinary Profession in their hearts.

The Review closes with an appendix giving the diagram of the present and the proposed organizations. Credit should really go to the authors of the valuable Review for the pains they have taken in bringing this useful publication for the benefit of the Government and of the Public.

We hope the Re-organisation scheme will not be delayed in Bombay Presidency in spite of the fact that there is great financial stringency, because it is at such a time the cattle owner suffers the greatest loss from disease and death among his cattle. When re-organising, it is hoped the above remarks will be borne in mind. Nothing should be done to discourage the Indian Veterinary Graduate from taking his right place in the community and create discontentment.

An interesting and exhaustive article on "Victoria Gardens and the Zoo" Bombay, has appeared in the "Evening News of India" dated 21st Aug. 1931. We regret we are unable to publish the article in its entirety due to pressure of space. But a few relevant facts of

professional interest are extracted in this issue. It is just to point out how superior are the claims of a Veterinarian to be in charge of Zoos and the immense good likely to accrue to the animals under his charge, to the Management and to the Public. We wish this lesson from Bombay will not be lost sight of by other Presidencies and Provinces and Indian States.

Correspondence

To THE EDITOR, *The Indian Veterinary Journal*, Madras.
Sir,

Herewith I am sending you a new creature which is a cross between the poet and the veterinarian. But, I feel sure you will read between the lines, that there is an under-current of seriousness in those seemingly funny rhymes. It is a true picture of the disease with its signs, symptoms and treatment.

It was meant originally for my own use being a sort of tips for expanding in the theory paper; but it later struck me that it might be of similar aid to memory to others as well. Knowing that there are many veterinary students who read your journal, I have sent it on to you.

Yours faithfully,

LAHORE,
6th Sept. '31.

(Sd.) D. RAMIAH SETTI, L.V.P.

SPLINTY RHYMES.

Good surgeons all of every sort,
Give ear unto my song,
If they find it wondrous short,
It cannot hold them long.
Horse falls an easy prey,
Between ages five and six,
High action, faulty shoe,
Concusson's a simple cause,
Pegged knee, and simple chain,
In before and out behind.
Lame when fresh not when cold,
Walking sound and trotting lame.
Nodding head and stilty gait,
Cold, blister one in five,
Why should lameness still persist,
When point firing results best.
Matters worse mallet and gouge,
Try reaction with strict precaution.

D. R. SETTI.

Extracts.

AGRICULTURAL RESEARCH

Council's Report.

To what extent the Imperial Council of Agricultural Research has been able, during the two years that have elapsed since its inception, to advance agricultural research in the interest of the vast agricultural population, without encroaching upon the function of the Provincial Governments, is made known by the report of the Council for the period from June 1929 to March 1930. This is the first report on the working of the Council which is located at Simla and Delhi and sets out in brief the various activities of the Council.

Animal Husbandry

As regards Animal Husbandry the report observes: The Animal Husbandry side of the Council's activities will, however, always lag behind the agricultural until two disadvantages from which it suffers are remedied. One is that the Veterinary Departments in India are greatly *undermanned*. Unless these departments are adequately staffed, both in regard to numbers and in the *quality* of their personnel, it is to be expected that suggestions for conducting research from the provinces will be few and far between. The Council is however, doing what it can to remedy this state of affairs, and it is likely that, as has been stated above, schemes for research in Animal Husbandry which have been under preparation during the period under review and which entail the giving of grants for the creation of disease investigation staffs in the provinces, will come into effect in 1931-32.

The Council's resources are, however, not so extensive nor indeed is it its function to bring the Veterinary Departments in India up to strength, and it is to be hoped that the provinces, will, on their part, do what they can within the limit of their means to make up this deficiency. The second disadvantage is that the existing veterinary colleges have been compelled by circumstances to accept comparatively low standards of educational and scientific training for their graduates, while facilities for Animal Husbandry research, which should be an important part of veterinary education, have been very inadequate at most of these colleges in the past. Requests for grants for schemes of research with an agricultural basis are coming to the Council in an ever increasing stream from the Universities, but that is not so on the Animal Husbandry side; and in view of the heavy capital expenditure involved in establishing the comparatively large farms that are required to carry on such research on an adequate scale, it is difficult to see how Universities could take up schemes which could be expected to produce results of any practical significance within the terms usually set by the council in making grants. From its very nature, there are only certain lines of Animal Husbandry research which can be successfully conducted in the Universities.

The Council has, during the period under review, developed its activities in the matter of dissemination of information, which is one of its functions in three directions.

(1) By providing facilities to scientific workers in India to attend the Imperial and International Conferences bearing on Agriculture and Animal Husbandry.

(2) By subscribing to Imperial and International Institutions which purvey information of value to workers in India, and

(3) by means of its publications.

To summarise, the aim of the Council's work of publications is to provide in India suitable media for the publication of work done in India relating to any of the sciences with which the council's activities are concerned. As mentioned above, the work is done on a co-operative basis, and it is to be hoped that the same willing assistance which scientific workers in India have during the period under review given to the council in this respect will be continued in future years and that the standards of these journals and publications will be maintained to their present high level.—*The Hindu, 19th August, 1931.*

VICTORIA GARDENS, BYCULLA AND THE ZOO

One of the interesting places for sight-seers in Bombay is the Victoria Gardens at Byculla, and the Zoo. Compared with the zoos in other parts of India, the Bombay zoo stands unfavourably in its area; all the same great attention and care are being bestowed on it by the Municipality of Bombay in general, and the Superintendent of the zoo in particular.

To trace the history of the Victoria Gardens, one must go back exactly a century ago, for it was in 1830, that Sir Sydney Backwith, the Commander-in-Chief and Acting Governor of Bombay, first laid out a garden on the then known Mount Estate, Mazagon, under the auspices of the now extinct Agri-Horticultural Society of Western India, the object being encouragement of agriculture and horticulture in this part of India.

The Society established its garden at Sewri in 1835 on a piece of land obtained partly by purchase and partly by grant from the Government. The area was further extended subsequently on receipt of grants from Government in 1837 and 1840. In 1842, the garden was further enlarged by Colonel Wilkinson. Twenty years later, in 1862, the garden was established on its present site by Sir George Birdwood, assisted by Dr. Birst, Editor of "The Bombay Times," (now "The Times of India.") The public of Bombay subscribed in 1858 liberally for the establishment of a Museum and garden in commemoration of Queen Victoria's direct assumption of the Government of India. The Government contributed an equal share for the purpose.

The Animals

The zoo contains certain rare animals which, under ordinary conditions, will find the climatic conditions of Bombay very uncongenial. All the same, owing to the special care taken by the Superintendent

(Mr. D. S. Laud, Superintendent of the Municipal Gardens), the animals are treated well in their captive life. Rinderpest, plague, and tuberculosis—particularly among monkeys—are some of the diseases which the Superintendent had to contend against, in recent years for the preservation of the animals. The problem of food for animals is no less baffling. Animals in captive life do not get their natural food *i.e.*, the variety of food, that they get while in jungles or out wandering. On Sundays, the animals get extra food which is necessary for their well-being. Though the animals in their captivity lose the strength of their jaws or some times feel dull, their general condition is on the whole happy.

The Infirmary.

Attached to the zoo is the Infirmary which is also under the direct charge of the Superintendent. The Infirmary is the place where wild animals are kept apart till they get acclimatized to the conditions in the zoo. Whenever any animal is noticed to be sickly or have an injury, it is taken to the Infirmary and treated. Wild animals like lions and tigers are taken in travelling cages to the Infirmary for treatment and when an operation is necessary, they are carefully transferred to the operation cage which would be attached to the travelling cage and the animal for operation is jammed and attended to. Once jammed, the animal becomes a toy in the hands of the Superintendent. Some years ago when there was an outbreak of plague among the monkeys and antelopes of the zoo, the Superintendent had a very trying time; on account of the care taken by him, he was able not only to save many animals but also prevent the disease from spreading.

Amongst other functions of the Superintendent are those of observation of the conduct and progress of the animals and birds of the zoo. Owing to the monotonous life they lead the animals sometimes behave in queer ways, but an intelligent and sympathetic keeper is a great asset, for he plays with them and relieves them of their monotony to a great extent.

Extracted from the "Evening News of India" 21-8-1931.

HEDYOTIS AURICULARIA IN AMŒBIASIS, CHOLERA, AND COLITIS

Editorial comment from the 'Canadian Medical Association Journal' of May 1931.

Some time ago,¹ we noticed editorially the use of *Hedyotis auricularia* in the treatment of various forms of diarrhoea, a remedy which was brought to our attention by Capt. P. R. Bhandarkar, L. M. & S., of Madras. Since that time Capt. Bhandarkar has continued his observations and now sends us a pamphlet entitled "Hedyotis Auricularia in Colitis, with special reference to Human Amœbiasis and Cholera."²

Hedyotis auricularia is a plant belonging to the natural order of Rubiaceæ, which is indigenous to the "wet-lands" of India, and to the

1. *Canad. M. Ass. J.*, 1929, 21, 591, 721.

2. Pharmacological Research Institute, Madras, 1930.

Malaya Peninsula and Archipelago, Malacca, South China, the Philippines, and Australia. The inhabitants of Sikkim eat its leaves, finely cut and boiled with rice, and in South Kanara it is used as a household remedy for diarrhoea and dysentery, in the form of a bolus of the fresh green leaves or as a decoction of the whole plant. It is also used prophylactically as a soup during the monsoon months. The plant is not officinal and is not referred to in medical literature. B.B. Dey, M.A., D.Sc., F.I.C., Professor of Chemistry at the Presidency College, Madras, has succeeded in isolating from it an alkaloid and its hydrochloride in pure state, together with a possible glucoside.

Capt. Bhandarkar gives details in his pamphlet of twelve cases of dysentery or colitis treated with the remedy, either in the form of a fresh bolus or as a standardized liquid extract. All the patients recovered except one who died suddenly from cardiac failure during convalescence, probably owing to scurvy as a complication. As Capt. Bhandarkar admits, not all the cases will stand scientific scrutiny, but three out of the twelve were definitely diagnosed as amœbiasis by finding active *Entamoeba histolytica* in the stools, and after treatment the amœbæ had disappeared or were dead and disintegrating. Two of these cases were acute and one was chronic. Under the drug relief was afforded often in twenty-hours and cure was effected in from five to fourteen days. Many of the patients had been treated previously by emetin, opium, or astringents in the ordinary way without a cure being obtained, or even amelioration, yet the disease yielded to *Hedyotis*. It was probably not a case of *Post hoc propter hoc*. The cases recorded were from the practices of a number of physicians acting independently.

The striking results obtained by Capt. Bhandarkar with *Hedyotis* in cases of acute and chronic colitis induced him to try it in infective diarrhoea, and later in true cholera asiatica. Of 114 cases diagnosed clinically as cholera, 79 treated by the ordinary accepted methods had a mortality of 44.3 per cent: 30 treated with "Hedaurin" (extract of *Hedyotis auricularia*) had a mortality of 13.3 percent. Numerous other cases, in which the cholera vibrio was isolated, were treated with success, there being a mortality of only 12.9 per cent. In Madras, from July 28, 1929, to January 4, 1930, there were 19,127 cases of cholera, treated by the old methods, with a mortality of 50.54 per cent. Capt. Bhandarkar thinks that, while the number of cases of cholera treated with the new remedy is not large, the excellent results obtained are "strongly indicative of its probable specificity in cholera." He appeals to the medical profession to investigate further the therapeutics of *Hedyotis auricularia*. He seems, at least, to have made out a *prima facie* case for his contention.

[We have had several occasions to give a trial to this drug-*Hedyotis auricularia* in our practice especially in cases of amœbic dysentery in dogs and diarrhoea in calves and cattle and we are glad to state, that we have met with marked success with this drug. *Ed. I. V. J.*]

A REVIEW OF THE VETERINARY DEPARTMENT IN THE BOMBAY PRESIDENCY (April, 1931.)

1. As announced by His Excellency the Governor in his speech to the Legislative Council on the 17th February 1930, it is the intention of Government to examine the whole administrative machinery in order to ensure that it is working efficiently and economically and that it is designed to meet present-day requirements. In order to achieve this and to get a clear view of the needs of the future it is necessary to overhaul each Department and it is with this object and in order to obtain views and suggestions that this Review of the Veterinary Department has been prepared. While it is realized that any additional burden on the Presidency finances is at present impossible, it is nevertheless desirable to have a clear view of the requirements, so that progress may be made in the meanwhile in those directions which do not involve expenditure and the others may be pursued when money becomes available.

1. Present Organisation

2. The subject "Veterinary" is transferred. It is in the portfolio of the Honourable Minister for Agriculture and is administered by the Revenue Department.

The functions of the Department may be divided under the following heads:—

- (a) Prevention and cure of cattle diseases, with special reference to epidemics;
- (b) Control of the importation of cattle at ports, so as to prevent the importation of diseases;
- (c) Educational work at the Veterinary College, Bombay;
- (d) Veterinary dispensaries;
- (e) Inspection of animals for slaughter and meat after slaughter, where Municipalities so desire; and
- (f) In Sind particularly, control of horse-breeding operations.

In addition to these principal duties, there are minor duties such as inspection of cattle markets, attendance at shows and fairs, visits to pinjrapoles, certification of animal casings for export to America, etc.

3. Veterinary service is at present supplied to the public by means of three entirely independent "departments" operating in:—

- (a) the Presidency, excluding Sind and Bombay City and Port;
- (b) Bombay City and Port; and
- (c) Sind.

There is no officer responsible for veterinary services as a whole in the way that the Chief Conservator of Forests is responsible for all forest conservation and development, the Inspector General of Police for the Police and the Director of Public Health for Public Health, and it is a matter for consideration whether such unified control would not be advisable. The Heads of the three Veterinary Departments report separately to Government and the only official link between them is the Revenue Department which administers all three. The diagram at page 9

shows the composition of the various Departments, which may be summarised as follows.

4. In the Presidency, excluding Bombay City and Port and Sind, the Civil Veterinary Department is controlled by a Superintendent who has under him a staff of one Deputy Superintendent, five Veterinary Inspectors and 123 Veterinary Assistant Surgeons. The Department is responsible for the prevention and control of disease, and provides the professional staff required for State-aided veterinary hospitals and dispensaries maintained by District Local Boards and Municipalities.

5. The Superintendent is a touring officer with headquarters at Poona. In addition to his administrative duties he initiates and controls the work in connection with epidemics and is responsible for the proper conduct of the professional work in hospitals and dispensaries and visits these institutions as frequently as possible in connection with this and their general management. The Deputy Superintendent acts as his personal assistant. The five Veterinary Inspectors have been allotted divisions of three to four districts each. Within their divisions, they supervise work in connection with prevention and control of contagious diseases and undertake periodical inspections of veterinary hospitals and dispensaries. 104 Veterinary Assistant Surgeons are placed in charge of the veterinary institutions maintained by Municipalities and District Local Boards and their services are also utilized for disease control work within their jurisdiction (see paragraph 26, Review of Local Self-Government, March, 1931). One is seconded for service with the Society for the Prevention of Cruelty to Animals, Nasik, where he is in charge of the Society's Veterinary Hospital. The remaining 18 are intended to supplement the local district staff when epidemics are widespread and to form a reserve for leave purposes, and of these one is sent annually for a period of seven months, at departmental cost, to the Dangs as a touring officer. This staff is under the control of the Superintendent. By arrangement with the Society for the Prevention of Cruelty to Animals, Nasik, the Veterinary Assistant Surgeon seconded to that Society is available for epidemic work.

The most important part of the work of the department is that in connection with the prevention and control of epidemics. The chief diseases dealt with are Anthrax, Rinderpest, Surra, Glanders, Foot and Mouth disease, Hæmorrhagic Septicæmia and Black Quarter disease. This work is increasing very considerably and the resources of the department are heavily taxed at times in dealing with it.

6. Veterinary hospitals and dispensaries are maintained by District Local Boards and Municipalities (see paragraph 26, Review of Local Self-Government, March, 1931). There are 105 such institutions including that maintained by the Society for the Prevention of Cruelty to Animals at Nasik. With the exception of the Ramnarayan Amarchand Veterinary Hospital, Poona City, these institutions receive a grant-in-aid from Government, which ordinarily does not exceed one-half the cost of maintenance, and the service of Government Veterinary Assistant Surgeons are lent to Boards and Municipalities, free of all charge, to

conduct the work of the dispensaries, except in the case of the Nasik Society which receives a lump sum. The remaining income is derived from the general funds of the District Local Board or Municipality assisted in some cases by grants-in-aid from Municipalities to District Local Boards or from District Local Boards to Municipalities, contributions and donations from private bodies and individuals, or by fees charged for treatment.

7. In *Bombay City and Port* there are two separate charges both of which are held by the Principal of the Bombay Veterinary College. The departments involved are :—

(i) The Bombay Veterinary College; and

(ii) The Bombay City and Harbour Veterinary Department.

The Bombay Veterinary College.—The duties of the Principal are mainly concerned with the College. This is a teaching institution and is maintained by Government. It is affiliated to the Bai Sakarbai Dinshaw Petit Hospital for Animals, a non-Government institution managed by the Bombay Society for the Prevention of Cruelty to Animals. The Society's Officers manage the hospital and the College Officers treat the animals in the hospital, thereby obtaining facilities for imparting clinical instruction to the students of the College. The arrangement has been made by Government and the Society and is, under the circumstances, for the time being advantageous. The Principal teaches the subject of medicine to the final year students, supervises the teaching throughout the College and the veterinary treatment in the hospital as well as administering the institution. He is assisted by four Professors and Assistant Professors and the Assistant Principal who does teaching and laboratory work as well as administration in the absence of the Principal. In addition, there is a Lecturer who also acts as Laboratory Assistant, a Hospital Surgeon and a Compounder.

8. *The Bombay City and Harbour Veterinary Department* deals with equine diseases scheduled under the Glanders and Farcy Act and with the work of the Live-Stock Importation Act. These two duties are carried out for the Local Government and the Government of India respectively. The Government of India has not yet provided a quarantine station and although the Live-Stock Importation Act is a central responsibility, the staff employed at present on the inspection and detention, etc., of imported animals is a Provincial charge. The Bombay City and Harbour Veterinary Department consists of a Deputy Superintendent, a Chief Inspector and eight Inspectors. The Principal of the College controls the department in addition to his educational duties as a matter of administrative convenience. His functions in this connection consist in supervising the work of the Inspectors throughout the City as well as personally supervising the mallein tests of all animals imported and, when necessary, directing destruction of those that react and checking all certificates of health of animals landed in the Port. The work of the Deputy Superintendent and the Inspectors is concerned with the examination of imported horses and other animals and the inspection of all horses and stables in Bombay City and Bandra for Glanders, Farcy and other diseases.

9. *Sind.*—The third department dealing with veterinary matters is the Civil Veterinary Department, in Sind. It is controlled by the Commissioner in Sind through a Superintendent, who is a member of the Indian Veterinary Service, 2 Inspectors and 21 Assistant Surgeons, of whom 18 are in charge of dispensaries and 3 are on general duty. The department takes in Rajputana and its duties are similar to those in the rest of the Presidency, although it is quite independent of the "Presidency" and Bombay City Veterinary organisations. The staff is inadequate for the needs of the sub-province and there are no fewer than 43 Talukas without veterinary dispensaries. The Bovine population in Sind per veterinary surgeon amounts to 110,700 as compared with the Royal Commission on Agriculture's recommendation of 25,000.

II. Co-ordination with other Departments.

10. *Revenue Department.*—Revenue officers and their subordinates, who are constantly visiting villages, can be and are of great assistance to the Veterinary Department in reporting the occurrence of epidemics and in using their influence in inducing stock owners to follow the instructions given by departmental officers. In the Presidency the village patels and in Sind the tapedars are responsible for reporting outbreaks to the Mamlatdar or Mukhtiarkar who arranges to inform the nearest Veterinary Assistant Surgeon. While a great improvement is generally noticed in this respect it not infrequently happens that the report is sent in late or not at all with the result that, when the Veterinary Assistant Surgeon visits the village, the disease has either died out after causing enormous mortality or the epidemic has spread to such an extent as to make the task of suppressing it extremely difficult.

11. *Agricultural Department.*—The officers of the Agricultural Department are generally in close touch with those of the Veterinary Department and it is their duty to report outbreaks of disease which they may discover during the course of their visits to villages. The most important subject on which the Agricultural and Veterinary Departments are jointly concerned is that of animal husbandry. The Royal Commission on Agriculture dealt with this subject at considerable length owing to the immense loss to agriculture caused by contagious disease. The agriculturist is still dependent on cattle for transport and cultivation purposes and the occurrence of a severe epidemic, such as Rinderpest, causes considerable loss to them not only on account of mortality but also by interference with agricultural operations. The improvement in live-stock also is dependent to a very large extent on the freedom of the herds from epidemics. The two branches of work are therefore closely related. As already stated Animal husbandry is in charge of the Live-Stock Expert who is under the Department of Agriculture, but owing to his limited budget this officer is not given sufficient scope for this important work. Though it is not in agreement with the recommendations of the Royal Commission on Agriculture, it deserves consideration whether as breeding is more allied to veterinary than to agriculture, he should not work directly under the Director of Veterinary Services, that he should have a separate budget provision for animal breeding and that intensive breeding should be com-

menced. As it takes a considerable time to effect improvement in live-stock it is essential that the work should continue unhampered by sudden budget fluctuations and it will therefore be necessary to fix a certain minimum in the budget for the purpose.

12. *Co-operative Department.*—In this connection, the officers of the Co-operative Department can be of great assistance in controlling breeding operations and in improving the stock as it is to them that the agriculturists appeal for help when purchasing bullocks.

III. Defects of the Present System and Proposals for Improvement.

13. *Administration*—Apart from the undesirability of having three distinct departments dealing with veterinary work the organisation of each of the departments has defects which need to be remedied. The principal ones are a shortage of staff and dispensaries and the need for investigation and research into animal diseases. It has been realised for some time that the present staff is inadequate to meet the normal veterinary needs of the Presidency. The superior staff has had no appreciable addition to it since the department was first inaugurated although the work of the department has much expanded and the subordinate staff has increased proportionately, and it is becoming increasingly difficult for the Superintendent to control the subordinate staff, widely distributed over the Presidency, and direct the work along proper lines. Nor is the present subordinate staff sufficient to carry out the double duty of disease control and hospital work, since it is not practicable to remove them from the stationary institutions of which they are in charge for long periods in order to send them to a distance for disease control work. The number of men employed is limited by the number of hospitals and dispensaries and as their financial condition does not permit of all Local Boards maintaining sufficient veterinary institutions for the needs of their districts, the number of dispensaries and the subordinate veterinary staff are to a certain extent unevenly distributed (see paragraph 26, Review of Local Self-Government, March, 1931). This could be remedied by inducing the poorer Boards to open more dispensaries by offering them larger grants-in-aid, but the financial position at present does not permit of further commitments in this connection. To make up for the shortage of subordinate staff it has been suggested that the reserve staff should be increased from 20 per cent. to 40 per cent., thus allowing a sufficient number over and above those required as leave reserves available for disease control.

14. The inadequacy of the veterinary staff in Sind has already been referred to and the suggestion has been made that there should be legislation for the compulsory treatment of contagious diseases and control of the movements of cattle, otherwise the work which is being done by the small staff of Assistant Surgeons will be of no avail to stem the progress of the disease. It is also suggested that small charges might be made for services rendered to individuals.

15. *Recruitment.*—With the provincialisation of the Veterinary Service in 1930 recruitment to the Indian Veterinary Service was stopped and the Service was divided into two branches, Class I and Class II.

There are three officers of the Indian Veterinary Service still serving in the Presidency who retain their rights as members of an All-India Service, but whose appointments will automatically be filled, when they retire, by Provincial Officers of Class I.

Vacancies in Class I are to be filled by—

- (a) Nomination from among candidates in possession of an M.R.C.V.S. degree except in special circumstances when a graduate of an Indian Veterinary College is possessed of exceptional attainments; or
- (b) The promotion of members of Class II who are of proved merit and efficiency,

Vacancies in Class II are to be filled by promotion of officers of proved merit and efficiency from the ranks of the Subordinate Veterinary Service, but direct appointments may be made at the discretion of Government by nomination from amongst candidates possessing the qualifications of an M.R.C.V.S. or from graduates of recognised Veterinary Colleges in India who possess special qualifications.

16. There are at present only one officer in Class I and seven officers in Class II. Of the latter, only one possesses the qualifications of an M.R.C.V.S. One of the officers in the Indian Veterinary Service will retire on 31st March 1932, while two officers in Class II are due to retire this year (1931).

The question of recruitment is of importance, especially in view of the contemplated reorganization. In addition to the appointments of Director, Veterinary Services, and the Principal, Bombay Veterinary College, who will be either members of the Indian Veterinary Service or Bombay Veterinary Service, Class I, it is considered that two of the Deputy Directors in the Presidency, excluding Sind, and the Deputy Director in Sind should be Class I officers. As the only Class I officer and five of the seven officers at present in Class II are employed as Assistant Principal and Professors in the Bombay Veterinary College, respectively, it is evident that the services of experienced officers will have to be obtained temporarily until suitable recruits can be obtained.

17. It has been suggested that as all Provinces are short of Veterinary Officers, the Army Department might be requested to second to this Presidency two or three Veterinary Officers, who have had administrative experience as it is realised that the chief difficulties will be experienced in the early stages of the reorganisation of the department. The next step would be to obtain suitable recruits for Class I and Class II, and in this connection it will no doubt be necessary to nominate direct to Class I officers who have had administrative experience in India or other countries.

18. *Research.*—It is recognised that investigation and research into animal diseases is of the greatest importance. It is considered advisable

that research should be carried on at the Bombay Veterinary College as the presence of a research officer there and the laboratory would prove valuable additions to the training resources of that institution.

As regards the Bombay City and Port organisation, there are difficulties in the fact that the College is affiliated to a non-Government hospital, while an up-to-date laboratory at the College is urgently required. An estimate for a laboratory has been prepared amounting to Rs. 67,000 but funds cannot be made available. The College has been organised solely as a teaching institution and not as a research centre and should research have to be undertaken a thorough reorganisation of the staff will be essential as the present staff is insufficient for that purpose.

19. *Animal Husbandry*.—The following have been given by the Royal Commission on Agriculture as the main reasons for the lack of success in the improvement of live-stock in India:—

- (i) Inadequate provision of forage to maintain condition throughout the year ;
- (ii) Abortive attempts to introduce European breeds unsuited to Indian conditions ; and
- (iii) Want of continuity in breeding policy.

In addition to the above, the lack of a properly organised and scientifically directed Animal Husbandry Division of Agriculture with adequate funds and facilities for studying live-stock problems from all points of view and for carrying out measures for the improvement of stock on an adequate scale has also been considered as an important reason. Experience has shown that animal husbandry undertaken in India in the past has not been organised on a sufficiently broad scale to produce any marked effect on live-stock improvement and has suffered from want of funds and lack of sustained interest, and the work which has been done in this Presidency in breeding improved bulls on small Government farms, where the numbers which can be produced are small, has not had any broad effect on the improvement of live-stock.

20. The Live-Stock Expert in the Presidency is at present under the Director of Agriculture. He has no separate budget provision and for this reason his work has been limited to a great extent and he has not been able to follow a definite programme which is essential in the breeding of large animals. The breeding of large animals cannot be compared with plant breeding as in the latter failures can be destroyed without much loss, whereas a mistake once made in the breeding of animals cannot be rectified without grave loss. Breeders of live-stock have to be far more conservative and averse from changes of policy because no breeder of the larger domesticated animals is able to breed enough of any improved type to produce an appreciable effect on the stock of the country within a generation.

21. The bulk of the existing females must be bred from, and to obtain true-breeding strains of the type desired is the work of a lifetime, necessitating a carefully planned and long continued policy and an intimate knowledge of the class of stock concerned. This knowledge can only be

gained by practical experience and by that sympathy and close study of individual animals and strains which is characteristic of all successful breeders, but cannot be expected to exist in plant geneticists.

It is clear that there must be close collaboration between the Live-Stock Expert and the Agricultural Department, which deals with the production of forage and its utilization. Equally, however, the care in the breeding of animals, to be successful, must be controlled by Specialists who can devote the whole of their energies to the care of animals and who by their experience and training are best placed for giving sound scientific direction in such matters and for developing the organisation of animal husbandry work. Judged from experience of other countries better results appear to have been obtained when such services are broadly controlled by Veterinary Directors, though it does not follow that animal husbandry work such as breeding and nutritional research should be carried out by veterinary authorities. It would appear, therefore, that this question should be re-investigated.

22. *Control*.—It will be obvious that the lack of unified control in the veterinary services is a defect which should be remedied and in the following pages is given an outline of the proposals which have been made to secure unification (see also diagram at page 9). The Civil Veterinary Department in the Presidency, the Bombay Veterinary College and the Bombay City and Harbour Veterinary Department would be amalgamated and brought under the control of a Director of Veterinary Services.

In the Presidency, excluding Sind.—The Director would be assisted by three Deputy Directors who would be placed in charge of areas corresponding to the Revenue divisions, the Veterinary Inspectors' posts being abolished. To provide for the increase in the reserve of Veterinary Assistant Surgeons urgently required for disease control work, it is proposed that the reserve strength should be considerably increased. These extra officers would be at the disposal of the Director for disease investigations and control wherever and whenever required. When not actually engaged on this work they would be usefully employed as touring officers in talukas, visiting fairs and markets, and generally enquiring into the prevalence of contagious diseases and the conditions of live-stock.

23. Since there is in India no central veterinary control and as the Bombay College trains men required for the subordinate staff employed in the Presidency, it is considered that the College should be placed under the direction of the Provincial Director, the Principal standing in the same relation to the Director as does the Principal of the College of Agriculture to the Director of Agriculture. The charge of the Bombay City and Harbour Veterinary Department should remain as before with the Principal of the Veterinary College, as the work of this department has decreased considerably during the last few years. In view of this and for purposes of economy, it is proposed that the post of Deputy Superintendent should be abolished.

There has been a considerable decrease in the number of animals imported during the last few years, on account of the increase in motor transport. It is reported that during 1930 only about 400 animals were imported into the Port of Bombay as against 4,000 ten years ago.

24. *The Bombay Veterinary College.*—The Principal of a Veterinary College should be essentially a teacher and an education officer and should not be burdened with unnecessary office work and administration and for this reason and for the sake of co-ordination it is desirable that the College should be under the direction of the Provincial Director. Research work should be carried out in the College, both for the sake of the benefit it confers on an educational institution and to assist the Director in the control of disease. In order to do this an up-to-date laboratory should be provided and a small isolation veterinary hospital should be built for which a suitable site exists at the back of the College. This hospital would provide valuable material for instructional purposes, besides enabling animals to be kept under observation in connection with disease investigation. Biological products useful in the control of disease, e. g. Rinderpest virus, could be prepared there. In order to carry on the research work as indicated above the staff of the College would have to be thoroughly re-organised on a similar scale to that at the Madras Veterinary College where research work of the same kind is undertaken. The present facilities for practical instruction provided by the hospital of the Bombay Society for the Prevention of Cruelty to Animals is a valuable asset and under present circumstances the College is not able to dispense with the facilities it offers. It is suggested that an improvement in the standard of qualifications and an incentive to recruitment might follow if the college were affiliated to the University.

25. *Sind.*—It is proposed that the administration of the Civil Veterinary Department in Sind should remain under the Commissioner in Sind assisted by a Deputy Director. The latter will, however, be under the Director of Veterinary Service on questions of technical policy so long as Sind forms part of the Bombay Presidency. At present the Civil Veterinary Department in Sind includes Rajputana, but owing to the distance from Karachi inspection and supervision is difficult for the Superintendent and it is suggested that the Government of India should take steps to separate Rajputana from Sind for veterinary purposes. It is on this assumption that it has been proposed to abolish the posts of the two inspectors and to increase the sanctioned reserve of Assistant Surgeons to 40 per cent. of the number actually in charge of dispensaries. These additional Assistant Surgeons will be utilized in the same way as the extra staff is proposed to be used in the remainder of the Presidency.

The question of horse-breeding should be kept in view, but in order to organise this work satisfactorily very heavy special expenditure would be involved and until the financial position improves it is not possible to make any great headway in this matter. The proposals referred to above are in accordance with the recommendation of the Royal Commission on Agriculture.

IV. Summary of Conclusions.

26. The following is a summary of the suggestions noticed above:—

(1) The abolition of the posts of Superintendents, Civil Veterinary Department, in the Presidency and Sind, excluding Bombay City and Port and the creation of a Director, who will administer Veterinary Services in the Presidency, including Bombay City and Port, and exercise broad control over technical policy in Sind and over the Bombay Veterinary College.

(2) The abolition of the five posts of Inspectors in the Presidency, excluding Sind, and of the two posts of Inspectors in Sind and the substitution of four posts of Deputy Directors.

(3) The abolition of the post of Deputy Superintendent in the Bombay City and Harbour Department.

(4) An increase in the cadre temporarily during the period of reorganisation.

(5) The separation of Rajputana from Sind.

(6) The charges of the Deputy Directors to be similar to the Revenue Divisions.

(7) A systematic increase in the number of dispensaries.

(8) A gradual increase in the reserve strength of the number of Assistant Surgeons in charge of dispensaries and hospitals.

(9) The establishment of an up-to-date laboratory for research work at the Bombay Veterinary College.

(10) The introduction of small charges for treatment at Hospitals and Dispensaries.

(11) Legislation to enable the department to deal with contagious diseases.

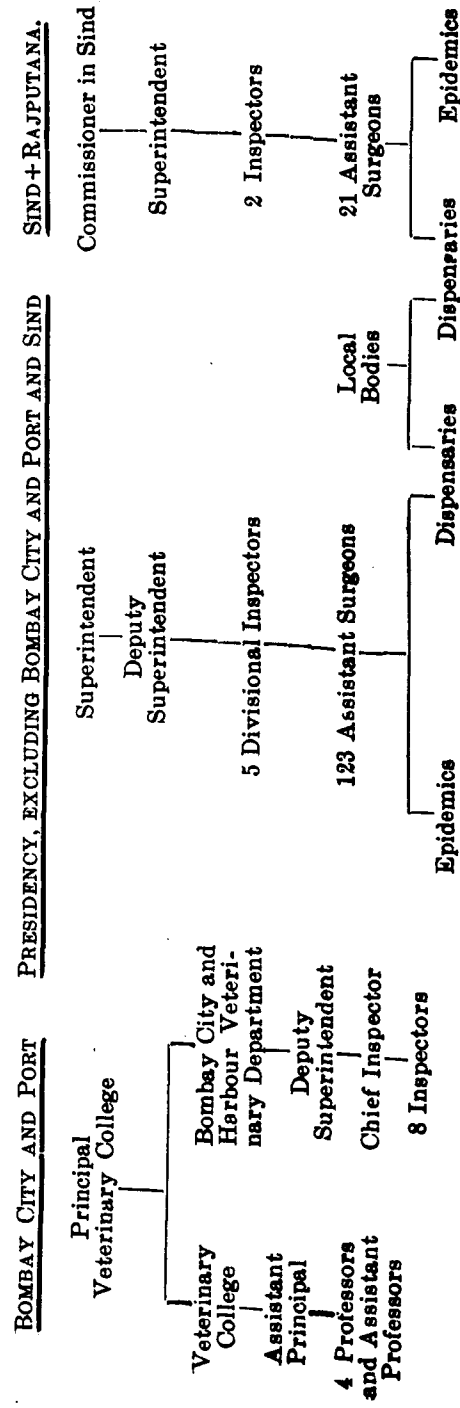
(12) Payment by the Government of India for the work done for them under the Live-Stock Importation Act.

(13) Further investigation of the question of the transfer of the Live-Stock Expert to the Veterinary Department.

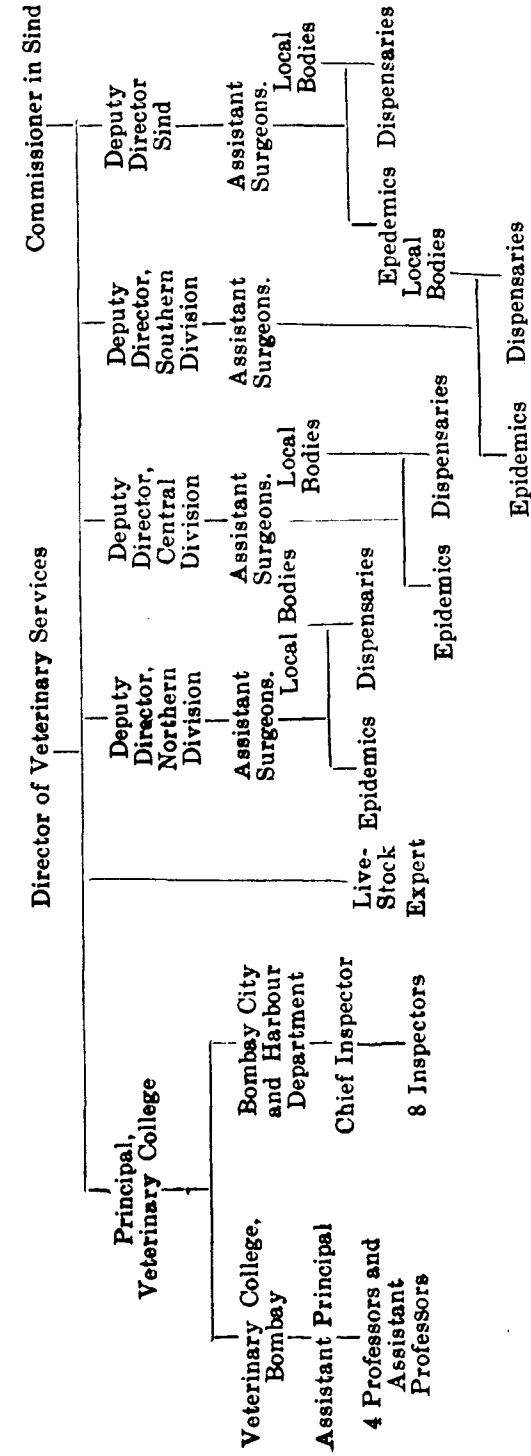
(14) Affiliation of the Veterinary College to Bombay University.

APPENDIX

PRESENT ORGANISATION.



PROPOSED ORGANISATION.



Review.

Feeding and Milking of Cows :—By A. C. Aggarwala, B. Sc., Hons. M.R.C.V.S. (Lond) A.I.R.O., Professor of Hygiene and Dietetics, Animal Husbandry, Milk and Meat Inspection, Punjab Veterinary College, Lahore.

Demy 8 vo. Pp. xii 204, Cloth Bound. Price Rs. 5/- net.
Publishers :—Messrs. Gulab Chand Kapur & Sons, Lahore.

It is not often that one comes across a book of real merit as the one under review. It is a beautiful compendium of all useful information on Cow-Keeping, narrated in a manner that is straight and simple. Divested of all technical verbiage and yet not losing even a single salient point the work is of high value and is bound to be popular both with the lay-public and the student of Science, Veterinary or Agriculture. After going through the book, our anxiety that it should be in the hands of all who have anything to do with Cows, is great indeed. Mr. Waitor Taylor in his foreword has rightly said "To improve the knowledge in dairying is almost a national question in India". Chapters on "Vitamins and their functions", "Balancing of rations" and the several appendices besides being a "ready reckoner" to the professional man, will do immense good to the country if only correctly understood and practised by holders of Cattle in India. It is a national service that Mr. Aggarwala has done and the profession cannot be blamed for not placing a book of such utility in the market within the easy reach of all. The price is only Rs. 5. We would suggest a translation of the book in various languages in India, so that it may reach even down to the ryot.

ERRATA

- Vol. VII, page 348 :—'A bucket full of phenyle lotion', should appear under the heading of 'Equipments' just below Head collar.
- " In the 2nd para under 'Technique,' in the last sentence between 'bandage'—and 'was placed' insert 'was tied over the ligatured part. A simple cradle.' Then it will read as :—A simple cradle was placed over the neck, etc.
- " page 349 :—In line 5, instead of 5th day read 15th day.
- " In the 1st line of the 3rd para instead of the 22nd day read 32nd day.

THE ALL-INDIA VETERINARY CONFERENCE.

An Appeal.

In response to the numerous enquiries from the enthusiastic workers for the cause of the Indian Veterinary Profession, regarding the venue of the next All-India Veterinary Conference, it is with feelings of disappointment, sorrow and regret that I have to issue this communication through the medium of this *journal*, to the effect that so far no Provincial Association has found it possible to arrange for and invite the next Session of the Conference to its midst. I have no doubt that all the members of the profession in this country will receive this information with feelings similar to mine. The great necessity for holding the next Conference at an early date under the present grave situation is well recognised by all those who have got the good of the Indian Veterinary Profession in their heart. But the conditions under which this important profession has got to live—a precarious life, do not seem to encourage the meeting of its scattered members on a common platform with a view to devise means for the advance of the profession and improve the conditions of Service, in which most of its members are at present employed in this country. It is a common knowledge that such meetings did not receive the encouragement from some high quarters in the past. It cannot be said that there was no positive discouragement or disapproval from some equally high quarters. Under the existing adverse circumstances, it is a wonder to some people that the *All-India Veterinary Association* was able to hold successfully Seven of its Annual Sessions till now and was fortunate to enlist the sympathy of at least a few of the high placed and noble minded Veterinary Officers, holding important positions in State Service.

During the last reorganisation of Subordinate Services in this country, the Veterinary Subordinate Service failed to get recognition and patronage which was properly due to it at the hands of the State. Subsequently, when the retrenchment proposals were given effect to in several Provinces, it is the Veterinary Subordinate Service which suffered most. Now there are retrenchment proposals throughout the country in all the Departments. Cuts in salaries and other allowances are suggested in different Provinces. So far the few Subordinate Service Associations which were brought into existence under the pressure and patronage of persons in high offices, do not seem to have been taken into confidence by the *Heads of Departments* in these vital matters. At any rate in one of the big Provinces, the Subordinate Service Association has not been fortunate enough all these years to succeed in its attempts to get the permission of the Head of the Department to wait in

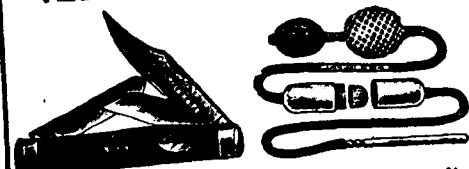
deputation on him! It cannot be denied that some of the Veterinary Directors and Advisers wield a good deal of influence with Local Governments and get things done very easily on matters concerning their personal selves and pockets. Well, probably that is only human. Charity, no doubt, should begin at home, but it should not end there. Is it not heart-rending to find the poor ill-paid half-starving subordinates struggling hard, crying themselves hoarse for help and redemption without any response whatever from these very Veterinary Advisers and Directors? Truly, Self-help is the best help: Let the profession remember it. On failures, we shall build up our success and triumph!

Besides the question of salaries of the members, the profession may suffer much with the severe application of the "Axe" in many other ways. The starting of new Institutions, opening of Serum Institutes, improving courses of studies in the Indian Veterinary Colleges, proposals to affiliate these to the Universities, investigation and research into several diseases of animals awaiting solution for a long time and many other important problems may receive a set back, if no effective representation on behalf of the entire profession is forthcoming to strengthen the hands of the official advisers in all these matters.

The very adverse circumstances briefly referred to above should prompt us to put forth greater efforts to overcome them instead of solemnly keeping quiet brooding over them, and it is for these reasons that it is necessary that some Province or the other should soon come forward and invite the next Conference to hold its Session in X' mas week. In 1929, Madras was able to successfully arrange for a splendid Conference at a short notice of hardly six weeks. By the time this communication catches the eyes of the members, there will be enough of interval between then and the X' mas week to arrange for a modest Session. Therefore, it is still hoped that some Province will come forward in the matter soon.

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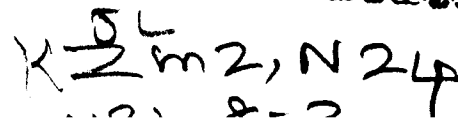
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