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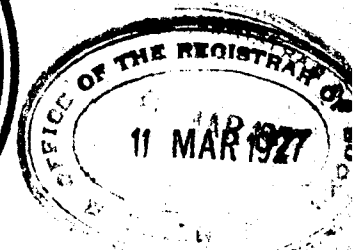
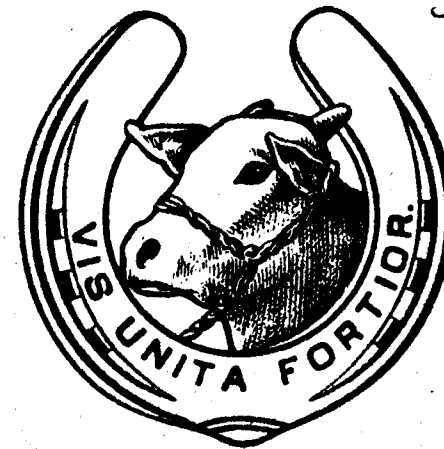


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THE
INDIAN
VETERINARY
JOURNAL

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Vol. III.	EDITOR: P. SRINIVASA RAO, G.M.V.C., Veterinary Surgeon, MADRAS.	No. 3.
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Vol. III.

January 1927

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(The Journal of The All-India Veterinary Association).



Editor :

P. SRINIVASA RAO, G.M.V.C.,

Veterinary Surgeon, Madras.

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1927

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:

P. SRINIVASA RAO, G.M.V.C.,

Veterinary Surgeon and Proprietor, Dr. Pangal's Veterinary Institute,
6, Wallajah Road, Mount Road, Madras, S. India.

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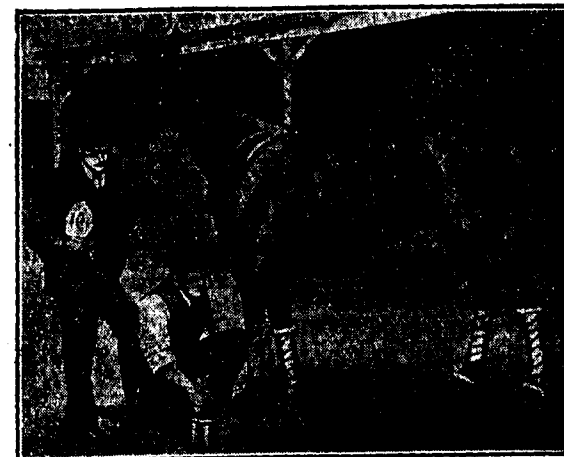
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JANUARY, 1927

No. 3

CONTENTS

- I. BIOGRAPHY.—
M. R. Ry. V. Krishnamurthy Ayyar Avl.,
G. M. V. C., I.V.S. ... 157
- II. EDITORIALS.—
The New Ministers and Veterinary Problems ... 159
The Madras Veterinary College and the Royal
Commission ... 161
- III. NOTES.— ... 162
- IV. GENERAL ARTICLES.—
1. Some experiences on Serum Simultaneous method of
of Inoculation for Rinderpest in the Field
By C. Dandayutha Pani, G. M. V. C. ... 164
2. Bubonic Plague in Monkeys By Shukla ... 172
3. Pancreo: Intestinal Trematodes in cattle
By H. C. Sen, G. B. V. C. ... 175
4. Contagious Nasal Granuloma and its Treatment
By Dewan Faizuddin Ahmad, G. B. V. C. ... 183
5. A Brief Note on mixed Infections and Simultaneous
Attacks of two Infective Diseases in one animal.
By Aziz Uddin Sircar ... 188
6. Urine and its Examination By J. M. Bhatt, G. B. V. C. ... 191
7. Microscopical Examination of Blood Specimens
By V. R. Gopalakrishnan, G. M. V. C. ... 214
- V. CLINICAL ARTICLES.—
A case of chronic cystitis in a Pony.
By M. V. Pillai, G. B. V. C. ... 201
Trypanosomiasis in Bullock By M. V. Pillai, G. B. V. C. ... 203
A Few cases of Debility in dogs, Diagnosed as
Filaria Immitis after P. M. Examination
By M. V. Pillai, G. B. V. C. ... 204
Ephemeral Fever or Three Days sickness in cattle
By Udey Singh, G. P. V. C. ... 205
Stringhalt in cattle or Mandagudi
By Babu K. S. Sankaram, ... 208

Mal-Presentaion and use of Pituitrin in Feline Practice By P. S. Sundaram, G. B. V. C.,	...	209
Foreign Body in the throat of a cat By P. S. Sundaram, G. B. V. C.	...	210
Treatment of Capped Elbow in a Horse. By P. S. Sundaram, G. B. V. C.	...	211
Excision of Eye-Ball in Dog By P. S. Sundaram, G. B. V. C...	...	212
Removal of Urethral Calculi in a Bull Terrior Dog By P. S. Sundaram, G. B. V. C.	...	212
VI. TRANSLATION.—		
Asvavaidyakam.—Equine Medicine. By Sri Mahasamanta Jayadatta. Translated into English from the original Sanskrit, with notes and commentaries by Nripendra Nath Majumdar, (Bengal Veterinary Service).	...	221
VII. ASSOCIATION NEWS.—		
Proceedings of the Annual Meeting of the All India Veterinary Association Madras Branch for 1926	...	227
Report of the managing committee of the Madras Branch of the All India Veterinary Association for the year ending, 31st. October, 26.	...	234
VIII. EXTRACTS.—		
Experimental Infection of the Jackal (Canis Aureus) with Piroplasma Canis, Prana and Galli-Valerio 1895— A Preliminary Note by M. Anant Narayan Rau	...	238
Nasal Granuloma in Cattle By V. Krishnamurti Ayyer, I. V. S.,	...	241
Foot and Mouth Disease and its Treatment with Sterilised Milk By E. Meissner, D. V. M., Kutterschitz	...	251
Treatment of Nagana with Tartar Emetic in Zululand in 1821-1923 By Curson, H. H., M. R. C. V. S.	...	252
IX. REIEW.—		
The Annual Administration Report of C. V. D, Madras for 1925-1926	...	253
X. COMMUNICATIONS.—		
	...	257



M.R.Ry. V. Krishnamurthi Ayyar Avergal,
G.M.V.C., I.V.S.

THE Indian Veterinary Journal

Vol, 3]

JANUARY 1927

[No. 3

BIOGRAPHY

M.R.Ry. V. KRISHNAMURTHI AYYAR AVERGAL,
G. M. V. C., I. V. S.

WE wish to record in this number of our Journal, the life-sketch of an esteemed professional colleague, who by his unique official career deserves the attention of our profession. We do so with the hope that his career will serve as an object lesson to others of what perseverance, hard-work and a powerful will-power can achieve. We refer to M.R.Ry. V. Krishnamurthi Ayyar Avergal of the Indian Veterinary Service.

Mr. Ayyar is a native of the district of Tanjore and was born in the year 1885. He had his early education in the Kumbakonam College, that reputed centre of South Indian intellect. He joined the Madras Veterinary College in 1906 and graduated from it in 1908. During the course of his studies, he was the recipient of many a prize and in the final year class was the winner of the much coveted gold medal.

He worked in the Civil Veterinary Department for some time and in 1909 he was attached to the Madras Veterinary College as House-Surgeon. It was evident from those very early days that Mr. Ayyar was determined to make his mark in the profession whatever might be the obstacles in his way. The motto "Where there is will, there is a way" seems to have been uppermost in his mind.

mind and in 1910 he was taken on the staff of the Madras Veterinary College as third lecturer. It did not take long for him to make his worth felt on the authorities concerned and soon he was raised as the senior lecturer of the college. His handling of the subjects of Anatomy and Physiology was all that could be desired. Preservation of carcasses and preparation of anatomical models began in his time and some of them are still to be found in good condition.

In recognition of his capabilities he was given a provincial gazetted rank on the college staff itself as a personal appointment in 1917. Many thought he had reached the climax normally open to a Veterinary Surgeon with Indian qualifications. But the ceaseless endeavour of Mr. Ayyar to rise higher and higher equipping himself for the task he aspired, was more pronounced than ever. All these years of preparation and perseverance did not go in vain. It was indeed a day of triumph to Mr. Ayyar when he was promoted to the Indian Veterinary Service on the 30th June, 1922, and subsequently confirmed from that date in that exalted rank.

He has worked in almost all the laboratories in India. He is now the Professor of Pathology and Bacteriology at the Madras Veterinary College and has done much research work on Nasal Granuloma of cattle and Bovine Lymphangitis. He runs an excellently provided and very useful laboratory attached to the college.

Mr. Ayyar is now only forty one years of age and has before him many more years of public service, which we are sure he will make the best use of, to the cause of his profession and country. We appeal to him to champion the cause of the ill-paid subordinates and make their lot much happier than it is at present. That act of his will only be in fitting to the life of devotion to his profession, which Mr. Ayyar has been leading all these years.

We are anxious that the lesson of this life should not be lost on our readers. Mr. Ayyar started life with a good

deal of self-confidence and a set purpose of carving out a niche for himself in the Temple of Fame. Laborious days and ceaseless perseverance marked his life-time. The crowning of his efforts was not long in the coming. He is essentially a self-made man and to-day he enjoys an eminence in his field of work that may well be envied.

We wish Mr. V. Krishnamurthi Ayyar continued success in his profession and long life of self-less sacrifice in the cause of Research.

EDITORIALS

THE NEW MINISTERS AND VETERINARY PROBLEMS.

With the birth of new Legislative Councils all over the country, new ministry in most of the presidencies has been formed. We eagerly look forward to them to advance the cause of Veterinary Science and the profession, which did not receive the attention they ought to, at the hands of their predecessors in office. Two periods of reformed councils have come and gone, but we, as a profession are made to stay where we were six years ago; nay, in a much sadder plight in some of the provinces!

The cause is not far to seek. The ministers think they have more important duties than attending to such trifles as diseases of animals—which by the way do not constitute any electorate and which by a Merciful Providence have been deprived of the power of speech, to be of any nuisance to them—and that it is the fashion of the times to talk only of Agriculture and its immense potentialities, of Fisheries and Soap-making, of Co-operation and Industries, of Forests and Panchayats!

By all means let them attend to them; but we beg of them to forget not that there is such a thing as Veterinary Department and that cattle are dying in thousands every

year for want of adequate Veterinary aid in India. The very main-stay of Agriculture which they proclaim intend developing, is, the cattle-wealth of India. That is the property of the Indian ryot and it is that property that needs all the protection a Government can give. "Safety of person and *property*" is a very elementary guarantee of any civilised Government. It is such a guarantee we seek of at the hands of our ministers.

From the evidences so far given before the Royal Commission on Agriculture, one will notice that there is a consensus of opinion on the present inadequacy of Veterinary aid and the need for its immediate expansion. Nothing short of opening more hospitals, better arrangements for the supply of sera and more hands to attend to outbreaks of contagious diseases, will satisfy the public.

A Research Institute for every province has been urged by almost all the witnesses both official and non-official. The extension of Veterinary Education to four years as in the Punjab and the increase of emoluments, which by their present low standard disgrace the profession and are a handicap on the new to inspire the necessary confidence and respect in the public and thus serve their country and the profession much better, are again some of the points presented before the Royal Commission.

These and many more grievances have been expatiated in detail in these pages time and again and we are glad to find that the country also thinks with us, judging from the evidences of non-official witnesses. We appeal to the Honourable Ministers in charge of Veterinary Department in several presidencies to do all that lies in their power to improve the profession so that they may say, when time comes to lay down office, with a joyful and proud heart that they had left the Veterinary Profession better than they found it.

THE MADRAS VETERINARY COLLEGE AND THE ROYAL COMMISSION

The Members of the Royal Commission on Agriculture paid a visit to the Madras Veterinary College at 3 p. m. on the 18th November, 1926. Both Mr. D. A. D. Aitchison, Veterinary Adviser to the Government of Madras and Mr. P. T. Saunders the acting Principal of the college received them and took them round the various departments of the college.

They were first shown the newly built pharmacy class, the final year class, then the museum and next they were taken to the Post-graduate class, where the Veterinary Assistant Surgeons were at work with the microscopes. Something in the nature of a surprise awaited them when they stepped into the Anatomy class and the new Dissection room. The models, charts, instructive diagrams and other arrangements were very much appreciated and the distinguished visitors opined that they had not seen the like of such models and dissection room anywhere-else in India. All credit is due to the Anatomy lecturer, Mr. Chelva Iyengar.

Next came the Laboratory where the Professor of Pathology Mr. V. Krishnamurthy Ayyar and his staff left nothing to be desired. Microscopes exhibiting several pathological sections, magic lantern slides showing organisms causing different diseases, the various stages of Rinderpest out-break and an endless collection of parasites were all features that immensely pleased the members of the Commission. A chart in graph showing the course of Rinderpest from 1909 to 1926 in the presidency of Madras and how it is controlled by the Civil Veterinary Department was much appreciated. After spending nearly an hour and a half at the college, the members of the commission left much impressed with all they saw. We congratulate the Principal, the professors and the staff of the College on the present efficient state of the institution.

NOTES

The ceaseless propaganda of educating the public of our needs, through the various branch associations of the A. I. V. A. has not been in vain. It is reflected in the evidences given by the non-official gentlemen before the Royal Commission on Agriculture.

* * *

Such a grasp of facts and needs of the country could not have been possible on the part of those who have no insight into the details of the working of the Civil Veterinary Department, but for the educative value of our associations in that direction.

* * *

We should not be understood to take off the credit where it is most deserved. We unreservedly thank all those gentlemen who had represented our cause so ably and so well.

* * *

Mere possession of facts is not by itself everything that one could desire. The presentation of those facts in a convincing manner and the sincerity of purpose in advocating a cause, go a long way towards the much cherished success. Judged from the above standard we could not have expected such powerful advocates on our behalf. All honour to them.

* * *

Our official witnesses also have echoed our sentiments. Our thanks are also due to them. Let us only hope that all these efforts will bear fruit in the near future.

* * *

We have received a copy of the proceedings of the First annual Conference of the Veterinary Graduates, Assam, held at Gauhati on the 26th December, 1925, i.e. nearly one year ago, only now. We are glad that secluded province has after all been touched by the spirit of the times. We wish them all success.

We cannot but praise the sympathy and support so ungrudgingly extended to the formation of the association by Mr. W. Harris, Superintendent, C. V. D., Assam. Here is what he says in one of his letters:—"The undersigned is not permitted to become an official of the association, *but he is willing to become a patron and his assistance and advice will always be at their disposal to make the association a success.*" The italics are ours.

* * *

How candid! and how genuine! We are sure the entire profession will hail Mr. Harris for this kindly attitude of his, which is much sought after but is ruthlessly denied in some provinces.

* * *

Mr. H. C. Sen, Chairman of the Reception Committee of the Assam Conference says in his address, "We have found out a very simple and effective treatment also for Anthrax and Hæmorrhagic Septicæmia with which it is possible to cure as much as 90% of cases. We have also discovered a treatment for Rinderpest with which you can cure 65 to 80% of your cases." The profession would like to know more in detail the lines of treatment referred to.

* * *

Information has been received from the General Secretary, the All-India Veterinary Association, Muttra, that the annual conference due to be held at Bombay during the Xmas week has been postponed to Easter holidays, under unavoidable circumstances.

* * *

"Lubber, a Nebraska horse, stands 20 hands high, and weighs a ton and a half. He is 5 years old, and is said to be still growing. It is claimed that he is the largest horse in the world".

Livestock Journal.

* * *

We invite the attention of our readers, particularly of the presidency of Madras, to the excellent address delivered by Mr. T. Vinayaka Mudaliyar at the annual meeting of the Madras Branch of the All-India Veterinary Association in connection with a resolution, published under the proceedings of that meeting.

* * * *

He has answered effectively the spurious question, 'What has the association done so far?' more often repeated than understood. Unrealised ambitions loom large before men and realised ones pale into insignificance. Mr. Mudaliar has done well in drawing the attention of the profession to be faithful to the past. A ring of sincerity pervades his entire speech, the effect of which, we hope, will not be lost on our Madras members.

GENERAL ARTICLES

SOME EXPERIENCES ON SERUM-SIMULTANEOUS METHOD OF INOCULATION FOR RINDERPEST IN THE FIELD.*

BY C. DANDAYUTHA PANI, G. M. V. C.,
Veterinary Assistant Surgeon
(on touring duty)

I had a very rare and good opportunity of learning and carrying out Serum-Simultaneous or Serum-Virus method of inoculation during my 5½ months service in Mysore State from August 1925 to the middle of January 1926. During this short time I had actually inoculated by this method about 3 to 4 thousand animals in about 30 villages. In my short paper of to day it is my desire to relate the process I adopted and what the difficulties and consequences were. Here, gentlemen, I should particularly avoid saying anything in favour of or against this

* Paper Read at the Second Annual Conference of C. P. and Berar Veterinary Association, 1926

method of handling the disease since most of the bacteriologists at present have not yet arrived at a definite opinion. It is still under investigation and the results arrived at recently are quite contrary to those laid down some time back.

In Mysore State Rinderpest epidemic for the last one year has done great havoc to the country. Hundreds of villages were affected and the loss due to this scourge was enormous. Like other parts of this country the Veterinary authorities tried to control the spread of the disease by passive immunisation of the healthy. After some time in spite of great endeavours it was observed that serum—alone method of inoculation became unpopular due to the inoculated animals contracting the disease after the period of immunity (which is only 9 days) has passed off. In most of the villages the veterinary assistants found great difficulty to make the cattle owners understand that the immunity conferred by passive immunisation lasts 9 days and to induce them to allow their cattle to be reinoculated. In some villages even after inoculation and reinoculation was carried out among all the healthy cattle the disease still persisted for a long time, due to the inoculated animals succumbing to the disease after the period of immunity has passed off by getting infection from the surrounding villages. Thus naturally, the people lost all confidence in this kind of inoculation and it was therefore thought to be a waste of public money to pursue this method any longer. Under these circumstances the Veterinary authorities were forced to discontinue this method of inoculation and to resort to the method of active immunisation with all its risks and at an enormous expense. First of all experiments were conducted on some Government farm animals and on a few village cattle. This was quite practicable in a state like Mysore where the cattle are free or have got great immunity against Piroplasmosis. Soon the results of inoculation in Mysore proved very encouraging; all the inoculated animals

possessed immunity for a considerably longer period than "Serum—alone" method; and the cattle owners slowly realized the advantages of this method and preferred this to any other. Immediately the Government sanctioned a large sum for serum and also for some extra staff of Veterinarians. Thus the operation of Serum-virus inoculation which was considered dangerous and difficult has been made quite a practicable one. It has become more or less an easy process among the Veterinarians in Mysore and they carry out the inoculation every day in such a perfect and large scale to the surprise of one and all.

Below, I shall endeavour to give you in detail the technique of the operation as carried out in the field. The following things are necessary for the operation:—

(1) Serum (active immunisation serum) (2) Virus—preferably taken locally from the affected animals, (3) Serum bottles empty for drawing blood, (4) Glass beads, (5) Cotton, (6) Wax (7) Spirit lamp, (8) Stove, (9) 40 c. c. syringe, or 20 c. c. syringe with needles, (10) 5 c. c. syringe, (11) Three porcelain gallipots, one for pouring serum, another for pouring blood and the third for melting wax, (12) Sterilizing set, (13) Saline tabloids, (14) Thermometer, (15) Pipettes, (16) One ounce bottles, (17) Tin bucket or a vessel (18) Tr. Iodine, (19) Scissors and (20) Phenyle.

With the above equipment, soon after going to the village of outbreak, enquiries are made about sick cattle. All sick cattle are first seen and their temperatures taken. Those above 105° temperature and have mouth lesions and have not yet commenced purging are selected for bleeding. In most of the villages the cattle owners refuse at first to submit their animals for bleeding. They abhor the sight of blood and much opposition is experienced before bleeding. But they are soon told about the advantages of Serum-simultaneous method of inoculation and slowly confidence is induced in them by promising to cure the affected animals. Generally in 90% of the cases

the owners consent to the wishes of the operator as they are always anxious to save the suffering animals first.

Immediately 2 or 3 blood bottles, one ounce bottle, glass beads, syringes and needles are sterilized in boiling water for about $\frac{1}{2}$ hour and then in boiling weak salt solution for about $\frac{1}{4}$ hour. The object of sterilization of bottles for a second time is to avoid the dilution of the salts of blood by the few drops of water that might remain in the bottles and thus cause the whole blood to putrify earlier. Then the sterilized bottles are plugged with sterilized cotton wool which has been passed over a spirit lamp flame. The blood bottles are filled to one fourth with sterilized glass beads.

Then the animal for bleeding is made ready. It is cast on the left side to expose the right jugular vein. The part to be bled is clipped and thoroughly cleaned. The vein is held raised by an assistant and the syringe needle is inserted right through the skin into the vein. Sufficient blood is collected in the sterilized bottles containing glass beads to one fourth of the bottle. Then 100 to 120 c.c. of serum according to the size of the animal is injected through the same needle right through the vein. Along with it a subcutaneous dose of 40 c. c. to 60 c. c. of serum is given at the shoulder blade. Here I would like to impress about curative properties of serum. Though this is doubted by many, still in my experience and in the experience of most Veterinarians in Mysore 90% of such cases get cured. It is by this method alone of saving most of the valuable affected animals, that the Veterinarians in Mysore are able to induce full confidence in the cattle owners. The animals so treated intravenously generally take to feed within two days and go about grazing quite normally.

Then the blood bottles containing blood are plugged with sterile cotton after passing over a spirit lamp flame and are well shaken for about $\frac{1}{4}$ hour to defibrinate the blood. Then the bottles are put in cold water for about

$\frac{1}{2}$ hour to make the blood froth settle. When blood has settled down with the febrin clot entangled with beads, they are taken out one after the other and their plugs are removed by passing their mouths over a spirit lamp flame. In a like manner the plugs of one ounce bottles are also removed and blood is transferred from the big bottles to the ounce bottles by means of sterilized pipette or by actual pouring. Immediately the bottles are sealed with sterile cotton dipped in melted hard paraffin. These bottles are further given externally a thick coating of paraffin. Having treated all bottles like this they are put in a basin containing cold water. Virus blood kept in this manner preserves its virulence for about 8 days without any putrefaction. The one most important factor for the preparation and preservation of virus depends on absolute cleanliness. A slight negligence on the part of the operator at any time means the contamination of blood and thus the loss of many lives. Herein lies the most difficult portion of the operation on the field where the operator cannot command all the conveniences of a well equipped laboratory.

Having thus secured enough virus, inoculation of the healthy is started. Before inoculating, each animal's temperature is taken and all those that show a rise of temperature are avoided. The rest are given $\frac{1}{2}$ to 1 c. c of virulent blood on one side of the shoulder blade or neck and on the other side according to the size 20 to 40 c. c. of active immunisation serum for country bred animals. Pregnant animals even a day before calving have been inoculated by this method without any untoward results. Young calves a few days old are also inoculated without any danger.

The great secret of success of this operation lies in the regulation of proper dosage of serum. The amount of serum to be used to particular kind of animals in a particular locality depends on the skill and experience of the operator. Generally the serum to be used depends propor-

tionately on the virulence of the disease in that particular locality and the susceptibility of the breed. The dose of serum to each animal should be regulated in such a manner that it is quite sufficient to overcome the disease. If more serum than what is required is used there is always the danger of the animal so treated not getting any reaction and thus no active immunisation (which is the object of this inoculation) is really conferred. In other words the dosage should be such that the animal is just allowed to pass through a mild stage of the disease. A smaller dose of serum on the other hand may prove fatal. Animals so treated get a virulent form of the disease and the serum is not sufficient to counteract it with the result that they succumb after a few days. Thus greater harm than benefit may ensue due to misjudgement or negligence. So, great skill and great power of judgement and very great responsibility are required of the operator in the process of inoculation. He should always bear this in mind and should always make complete enquiries about the virulence of the disease in each place and the percentage of mortality among the attacked. It is on this and on this alone that an operator can depend for the proper regulation of the dosage of serum.

Now comes another important item of the operation. The operator should test every day and ascertain whether the virus he is using is really virulent or not. This is generally done by keeping 2 control calves each day when blood is used. The controls selected are two young calves strong but of little value. They are given each 5 c.c. of blood alone without any serum and the reaction in them is watched carefully daily. A separate temperature chart for each animal is maintained for about 7 days. If the virus is really virulent the calves show a marked rise of temperature above 105° with symptoms of Rinderpest on the 5th day of inoculation. It may happen in some cases, though it has never occurred in my operation, that the controls never show any reaction at all on

account of the blood being not virulent or on account of some other changes in blood during its preparation and preservation. Immediately the operator should select another typical case and bleed as before and inoculate all the previously inoculated healthy animals before the 9th day with 1.2 to 1 c. c. of blood. Of course this is an extra work for the operator and unless he does this the process cannot be called really active immunisation. He has again to keep fresh controls and test the virulence of the blood he has used for the second time.

When the controls show reaction on the 5th day they are bled and treated intravenously as in a typical case. Between the 5th and 9th day after inoculation all the animals are again given 5 c. c. each of the virus alone collected from the controls. The object of giving virus alone before the 9th day is to test that all the animals that were treated by serum-simultaneous method are actually able to withstand any further infection. The period of 9 days is fixed for the second inoculation so that during this time even if the inoculated animal had not previously got active immunisation the animal is still under the effects of serum and no untoward results follow from the infection. Of course if there is a surety that the virus first used was quite virulent and that the animals have got true active immunisation there is perfectly no harm in giving 5 c. c. virus even after the 9th day. I have tried like this in some cases and the animals so treated never showed any reaction and were able to withstand such a large amount of infection normally 5 c.c. virulent blood. But to be always on the safer side it is advisable to avoid the second virus-alone inoculation after the 9th day. It is generally assumed that if the animals are to withstand the second dose they have been conferred true active immunisation and that they have in a way hyperimmunised them against the disease. After this the operator has to remain in the village for

complete two days, in the least, to watch the reaction. If by chance one or two show reaction they have to treat them with therapeutical remedies or serum inoculation intravenously as they think best according to the severity of reaction.

Although with this operation the whole process is complete still I wish to mention the great amount of difficulty that was experienced by the operators in villages in the early months of the inoculation. First of all the operators found very difficult to convince the villagers the object of keeping controls and the advantages of second time virus-alone inoculation. In most villages the owners refuse to give any calves to be kept as controls. Even if they give, much trouble is experienced during bleeding. As I have already said all villagers especially Hindus abhor the sight of blood and they prefer their calves' death to bear the sight of bleeding them in a public place. As such in the early months of this kind of inoculation a great hue and cry was made by the Veterinary Assistants. In fact in some of the villages they could not carry out inoculation for want of virus and of control calves. There was actually cessation of all work for some time. Immediately at the recommendation of the Superintendent the Government sanctioned a sum of Rs. 10,000 for the purchase of controls and other charges in connection with the production of virulent blood. Out of this money a special virus producing station was started at Bangalore with the object of supplying virus to all operators. Not only this, from this money each operator is given a sum of Rs. 50 as imprest money and they were authorised to purchase calves to the extent of Rs. 16 per calf in all places where protest is offered by the villagers. Thus one great difficulty in the way of the operator was removed. Now the operators purchase calves, keep them as controls and bleed them on the 5th day. After bleeding they are treated intravenously and when the animal recovers they are again sold

and the money so realized is remitted in the nearest treasury. In case the control calf is owned by a villager and in case it dies the owner gets the value of the calf which is decided by the village Panchayet.

Now I have finished with the whole process of this operation and with a few remarks I shall close this paper. The one great benefit as far as I could see by this method of handling the disease is that it confers immunity to the inoculated animals for a considerably longer time than "serum—alone" method, otherwise the whole process has several disadvantages. Firstly it is a very costly process and it takes a longer time for attending to outbreaks, at least 7 days in each village. Secondly it requires larger number of hands. Thirdly, unless each operator is provided with a microscope for examination of virus there is always the danger of infection of Piro organisms in healthy cattle along with Rinderpest virus. Fourthly by this method there is actually an increase in the centre of infection and unless there is legislation for the restriction of movement of the inoculated cattle there is the danger of spreading the disease from village to village. Generally it is very difficult to teach the villagers about this fact and they neglecting this take the inoculated animals, that are actually suffering in a mild form and are liable to infect other animals, from village to village and thus spread the disease. Lastly, the whole process cannot be done in such a satisfactory and perfect manner on the field by the operators as is done in a laboratory.

BUBONIC PLAGUE IN MONKEYS.*

BY SHUKLA

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Plague is a specific infectious disease characterised by great virulence and rapid course accompanied by

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buboes or pulmonary inflammation and due to the presence in the blood and tissues of the *bacillus pestis*.

The micro organism is a minute bacillus thick and with rounded ends which stain more deeply than the central portion. It is non-motile, non-flagillated and is gram negative.

There are three varieties of plague viz. *bubonic*, *pneumonic*, and *septicæmic*. As the type of the disease that occurred amongst the monkeys of the Maharaj Bag Zoo was a *bubonic* one I speak a few lines on this variety only. The average incubation period is from 3 to 5 days. The infection is conveyed from rat to man solely by means of the rat flea (*Pulex-cheopis*); thus the presence of an epidemic of plague in rats is followed by an epidemic of plague in men.

An epidemic of *bubonic* plague had broken out amongst the monkeys of the Maharaj Bag Zoo with a mortality of fifty percent of the animals. The progress of the epidemic and the methods to prevent further spread, such as inoculation etc. are given below:—

Two monkeys, one a Rhesus (*Macacus Rhesus*) and the other a Hanuman (*Semnopithecus-Entellus*), refused their customary meals on the 11th December, 1916 and looked dull and gave a peculiar shriek when moving about. As these phenomena were considered unusual these two monkeys were kept under observation.

The existence of *bubonic* plague at the time in Nagpur and particularly in Sitabaldi and the great susceptibility of monkeys to certain human ailments suggested advisability for immediate segregation. With the exception of one unmanageable monkey which had to be left in its old compartment in the monkey house, the rest were segregated.

By the next morning the two attacked animals had succumbed.

On examination of the carcase of the attacked a well

developed bubo was found in the axilla of the Rhesus variety.

Smears were taken from the bubo and submitted for microscopical examination. The films were found swarming with *bacillus pestis*. Smears were also made from blood of the Hanuman monkey which were confirmed microscopically, numerous bacilli of plague being present.

The carcasses were cremated and the place thoroughly disinfected.

These monkeys were segregated in an empty paddock on one side of the garden and the road leading to the monkey house was temporarily closed. On the morning of 15th December, 1916, one of the segregated monkeys (the sacred Abyssinian Baboon) was found dead; examination disclosed a well developed axillary bubo. On the same day, the remaining unmanageable animal was also found dead in his cage. These carcasses were also disposed of by cremation.

It was decided as an experiment to immunise the remaining monkeys by injection of Anti-plague Brew by similar method to those adopted for human beings; consequently the monkeys were inoculated by me with usual doses of Anti-plague Brew according to species, age and body weight.

As the monkeys of these kinds are proverbially mischievous they were partially controlled to a post by firmly catching their fore and hind limbs.

The inoculation was very easily and effectively done without hurting the animal. No deaths occurred subsequent to inoculation.

The points of interest are :—

1. Monkeys kept in captivity are highly susceptible to *bubonic* plague.

2. The symptoms manifested by a plague affected animal are almost similar to those shown in the human subject.

3. That a bacillus similar to that of *bacillus pestis* can be detected from the bubo and blood stream of monkeys affected by plague.

4. Monkeys like human beings can be immunised by the injection of Anti-plague Vaccine in doses varying from 1 to 3 c.c. according to the species, age and the body weight of the animal.

My observations on the subject were recorded in the issue of the Agricultural and Co-operative Gazette. Similar incidence has been reproduced in the recent issue of the Indian Veterinary Journal Vol. II No. 3 by Mr. D. S. Laud, the Veterinary Officer and Assistant Superintendent, Zoological Garden, Bombay.

PANCREO :

INTESTINAL TREMATODES IN CATTLE *

BY H. C. SEN. G. B. V. C.,

Staff Vety. Asst. in charge of Vety. Laboratory, Gauhati.

About the middle of November, 1925, I was called upon to inquire into the cause of deaths of a large number of cattle in a Chha'pri named Kira'ka'ta' in the Mangaldai sub-division of Darrang District. On arriving there I came to learn that about 200 heads of cattle died in about four months' time; besides cattle about 30 heads of goats also succumbed. All the animals both bovines and caprines showed exactly the same symptoms during their illness. As the disease was insidious in its course, but never the less fatal and as at the beginning deaths were rather few and far between it did not draw much attention of the owners concerned. But when the death rate began to increase they grew alarmed and sought for assistance, but, as ill luck would have it, this "*wait and see*" policy proved disastrous. Because the greater bulk of the cattle population of the place became so heavily

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infected by that time that a cure by any treatment was out of question.

There are 16 khutis belonging to different gowalas, out of which seven have only cows, seven only buffaloes and the remaining two have both cows and buffaloes. As there had been no mortality among the buffaloes the owners thought that they have not been infected. But nevertheless the general condition of the buffalo population of the place was unsatisfactory as they never put on enough flesh after the rains and the milk yield considerably decreased than what was in the previous years at this time. Even to a casual observer they—the buffaloes—would appear anything but thrifty.

Milk supply to the nearest town Gauhati is the only means of livelihood of the khutiwalas of the place, so this loss of cattle and milk diminution have considerably taxed their resources. •

Kira'ka'ta' Cha'pri is situated on the northern bank of the mighty river Brahmaputra, about 12 miles up from Gauhati.

Khuti are laid out in irregular lines beginning immediately from the river bank extending northwards. They may conveniently be divided into four blocks. The last khuti to the northern end, in block one, which suffered the highest loss 92 heads, is situated about two furlongs off from the river bank, by the side of a shallow fairly large water logged area. Next block that suffered great loss is the third one.

The disease broke out soon after the last monsoon. The whole place was subjected to inundation during rains, the flood rising to a record height. During that time cattle were huddled together in small patches of areas of lands that were found above water level. The animals had to be kept there during the whole of rainy season as their removal to other better sites was not possible then. During their sojourn in those small isles—so to say—under the sky, having no shelter whatsoever over

them to guard against the ravages of sun and rain, they had very little grass to graze on, the owners too little cared to supply them with fodder either. It is not the practice also among the gowalas to keep in stock provenders for use during scarcity. The above circumstances considerably reduced the vitality of the animals that were thus the victims of privations. Even when the water gradually went down the animals had to remain content, for a considerable time, although distasteful, unwholesome and repugnant, with the rotten grass that they could pick up in order to appease their hunger. The flood gradually went down leaving behind shallow pools the perfect centres for the development of various kinds of molluscs, animalcules and parasites. The stagnant water played no less a part in aiding the spread and enhancing the intensity of infection.

Clinical symptoms:—These may conveniently be divided into four phases.

First or the initial phase starts with the entrance of the embryos of the flukes into the system. This period invariably escapes detection as the animals manifest very little change in them except perhaps that they put on flesh to some degree for the time being. The primary infection, in the outbreak under record occurred in all probability sometime in the latter part of June or early in July.

In the second phase anæmia supervenes which is well marked. There is gradual emaciation, pallor of all visible mucous membranes, rapid exhaustion during movement with drooping of head and ears, sluggishness, puffiness of eye-lids, bluish colour of the sclerotic, watery eyes, harshness of coat, hidebound etc. Icterus is never seen. Appetite remains alright. There is increased thirst.

In the third phase there is pernicious anæmia, œdema in the submaxillary space and also dewlap, diarrhoea supervenes in various degrees in most of the cases,

occasionally mucus in dung and abdomen pendulous. In some although there is neither œdema nor diarrhoea there is tucking up of the abdomen and the animals pine away to an extra-ordinary degree. In this stage thirst increases. Œdema is always cold, painless, doughy in nature and never appeared to have caused suffocation even when it is enormous in size extending from the throat right down to the xyphoid space; sometimes it gets less, even disappears completely. They keep on feeding fairly alright. There is well marked weakness. The animals rise with difficulty after lying down for some-time.

In the fourth or the last stage the general weakness is much more pronounced. The animals lie down and are never able to rise on their feet again even when assisted, although they continue feeding and drinking well up to the last moment.

In this state they remain from a few days to many days. There is no actual paralysis of the hind legs as the animals can whisk their tails and throw their legs alright and respond to even slight pin pricks. It is the extreme general weakness that prevents them from rising on their feet. Diarrhoea increases in severity in some in this state, whereas in others dung remains almost normal. Death takes place due to complete exhaustion and appears to be peaceful as the animals succumb without a struggle.

Some animals showed marked improvement even after the manifestation of all the alarming symptoms which was maintained for sometime, but the worst symptoms reappeared in increased severity causing death. It is apparent that reinfection was responsible for it. Some showed occasional symptoms of colic and even of tympany. Some had cough but that could not be regarded as a symptom connected in any way with this disease under note as no lesion of any form of lung complication was discernible on postmortem. Tempera-

ture was invariably found much below normal, heart weak, pulse feeble even imperceptible and respiration almost normal. The whole course ran for about two months or even more depending certainly on the degree of infection.

Examination of dung for diagnosis:—Dung examination from cases before the use of anthelmintics gave almost negative results, so far the expulsion of flukes was concerned, macroscopically. In only one case out of twenty examinations a young fluke was detected in the mucus passed. In order to determine whether flukes are passed or not along with the dung, twenty five animals—the apparently diseased ones—were dosed with various anthelmintics and vermifuges and kept under observation. Dung passed, after the lapse of sufficient time, was examined by washing and straining through gauze. In only one case a dead fluke was discovered. It shows that adult parasites are very seldom passed with dung and it is difficult also to dislodge them even with anthelmintics and vermifuges.

On microscopical examination of dung some bodies like cercariae (?) and also ova in large numbers were noticed which were passed with dung before and also after the use of anthelmintics. Bodies recovered, other than those mentioned above, from the gut, on post-mortem, were found to be a very small variety of *Amphistoma*.

Causation:—It appears that this Trematode is due to the entrance of embryo-flukes of *Eurytrema Pancreaticus* into the pancreas and small bowels, probably through digestive organs along with the infected grass and water. The life history of the parasite, however, is unknown and efforts are being made to elicit it. Mr. W. Harris M. R. C. V. S., Superintendent, Civil Veterinary Department, Assam, is carrying on investigations. "Looss" found this parasite in China and Japan. No record has yet been made about its prevalence in India.

Morbid Anatomy :—On holding postmortem examinations in advanced cases all the general lesions of cachexia and of gastro-enteritis of varying degrees are found. The pericardial, pleuritic and peritoneal fluids that are usually noticed in most wasting conditions are met with. The quantity and colour of exudates varies, however, within wide limits. Sometimes the fluid is clear with transparent jelly-like material floating on it, sometimes it is very light yellow and at other times slightly pink in colour. The lesions are, however, not common in all cases. Characteristic lesions are noticed in the abomasum and particularly in the small intestines. The mucous membrane of these tracts presents evidences of intense catarrh, sometimes covered with loose crupous material or denuded of epithelium. It is oedematous, even jelly-like, owing to accumulation of effusion into the substance. It is also friable, on slight pressure it bursts allowing running out of the clear, transparent fluid. Petichial spots are sometimes found throughout the intestines, both small and large.

In the pancreas and in the mucous membrane of the small intestines particularly in the duodenum were found parasites of different sizes and ages adult and young in varied numbers. Some were also found in the abomasum. Probably their special habitat is pancreas where from after maturing they travelled to other parts. None in the liver or large bowels were found. In the gall bladder on two occasions were found a couple of *Fasciola Gigantium* and on one occasion 3 or 4 small amphistoma. Amphistomes were found in large numbers in the stomachs as well as in bowels in some cases. In the dense mucus throughout the intestinal tract were found in innumerable numbers minute brownish bodies like pin-points which examined under microscope appeared like amphistoma (?). Some small white slightly curved bodies were also noticed which when examined under microscope looked like radiæ (?). On the mucous membrane of the

intestines were found in some cases small white nodules to the size of small millets or grains which when cut open showed caseous, even calcareous matter, and even necrosed areas full of calcareous and caseous matters were found. These were probably caused by encysted parasite undergoing degeneration. In a calf only one month old were found on postmortem, lesions of intense catarrh, floating on the mucus of which minute brownish bodies as described before. Postmortem examinations were carried on in ten cases.

Description of parasite :—*Macroscopically* :—It is a trematode of the *Fasciola* group called *Eurytrema Pancreaticum*. It is flat, very thin and is a blood sucking parasite. It is livid red colour when first removed but soon loses its redness and becomes white, particularly, when put in some preservative. It becomes so white then that even with the naked eye parts of internal structures can be seen as brownish granules running along the sides of the body. The oral and ventral suckers are discernible on close circumspection. The size of the parasite varies according to its age. It is about 8 m.m. long and 5 m.m. broad.

Microscopically :—Both the suckers on the ventral surface are distinctly seen. The oral sucker is situated about the end of cephalic extremity. The other larger than the former is situated a little above the middle third of the body. It is a hermaphrodite as it possesses both the sex glands. Intestines which finish in cul-de-sacs on either sides of the body, uterus, ovary, oviducts, ova in innumerable numbers, can be seen distinctly on careful examination. Ova are oval in shape and have one or two dense mass in the centre. Dung examination from suspected cases of buffalo and goat also showed ova of *Eurytrema* under microscope in large numbers. Blood smears from too advanced cases showed bipolar organisms microscopically. It is evident therefore that the deaths were not only due to parasite infestation but a secondary

infection also took place. Toximia due to liberation of toxin by the parasites may also perhaps be regarded as a third factor.

Treatment:—It was carried on mostly in the way of experimental nature. Over sixty animals were put under treatment and regular charts were maintained. Various drugs were tried. e. g.

1. Turpentine with Linseed oil, followed by tonics and salt in food daily.
2. Male Fern with Olive oil.
3. Beta Naphthol, Antim. Pot. Tart., Ferri Sulph and Sod. Chlor. followed by tonics and common salt daily.
4. Pot. Permang. in water per orum, and normal saline intravenously.
5. Pot. Permang in rice gruel per orum., followed by tonics and salt in food daily.
6. Pot. Permang in water per orum also Antim. Pot. Tart, Ferri Sulph, Sod Chlor and salt daily in food.
7. Antim. Pot. Tart, Ferri Sulph, Sodium chloride with rice gruel and salt daily in food.
8. Antimony sol. 2. p. c., 15 to 20 C. C., intravenously, twice a week.

Out of all these the last named one i. e. intravenous injection of antimony solution gave promising results.

Prevention:—As a preventive measure change of place especially during next rains and to continue common salt in food as daily ration, were advised upon.

Lastly I am to add that Syt. E. C. Bhuyan R. V. A. rendered me much assistance in carrying on experimental treatment and post-mortem examinations.

CONTAGIOUS NASAL GRANULOMA AND ITS TREATMENT.*

BY DEWAN FAIZUDDIN AHMAD, G.B.V.C.,

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I was called to attend a few cases by a man of Jolla village in the District of Kamrup on the 24th October, 1918, informing me that they are suffering from a disease called "Hahuria" in Assamese.

I visited the place on the 25th October, 1918 and examined all the cattle of the herd and found all of them were suffering from the same disease.

Origin of this disease was traced out to a black C.B. bullock that was purchased by him about 3 years back from that date, with this disease from a market; during that period all of his animals had been affected. Contagion of this disease spread out to the village cattle also, after purchase of this single bullock. This led me to suspect it to be one of contagious nature. I duly reported it to my superior officers—the Superintendent, Civil Veterinary Department, Assam, and Mr. Ghose, the then Veterinary Inspector of Gauhati Circle.

I found a few of these cases in the first or early stage which had only redness of the nasal mucous membranes, with thin nasal discharge and wheezing sound.

On close examination mucous membranes were found a bit raised and ulcerated and roughness was felt by introducing a finger very gently into the nostrils, as a result of which blood came out.

A few were found that had small granules over the ulcerated mucous membranes of the nostrils, with discharge a bit thicker and wheezing sound more marked. They were considered to be in the second or middle stage of the disease.

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Rest of them had larger granules than those in the second stage—as big as pea, maize, gram and even bigger in some cases. They were considered to be in the third or last stage of the disease. In this stage turbinated and vomer bones also were found affected (seen in post-mortem examination). Nasal passages were almost blocked up, interfering with respiration. They had long inspiration, producing louder wheezing and sterterous sound, dilating the nostrils to the highest extent.

I found many of them quite round and fat, and a few were in run-down condition. In the latter cases the cause of poor condition could be accounted for, as result of some other disease.

In this connection and to give a thorough idea of this disease I believe it will not be out of place to mention history, clinical symptoms, general appearance and post-mortem symptoms of one particular case which was killed on the 20th July, 1920 evening and post-mortem examination held on the 21st July, 1920, to investigate this disease.

Subject:—A black C.B. bullock belonging to a man of Jolla village was suffering from Nasal Granuloma for more than five years. It was purchased five years ago with this disease from a fair. All the animals of the herd and a few of the village cattle had been affected through contagion from this one.

He was emaciated and hide bound and temperature was 98.4° in the morning of the day when killed, respiration difficult, inspiration long and nostrils dilated to their full extent. Granules as big as pea were found in both the nasal chambers. Discharge of thick mucus mixed with blood was passing out. Nasal passages were almost blocked up and wheezing sound was produced during inspiration which could be heard from a long distance of about 20 yards off. Pulse was imperceptible, appetite normal, dung semi-solid, mucous membrane icterus, eyes sunken and coat rough.

Post-mortem appearances:—

Nasal Chambers:—On cutting open, granules were found in the whole of nasal passages which extended up to the half of the vomers and affected the turbinated bones. Passages were almost blocked up.

Trachea:—Mucous membrane a little icterus; one strongile was found in it.

Oesophagus:—Anæmic.

Thoracic cavity:—Normal.

Lungs:—Smaller than normal in size (atrophied). Three nodules were found which contained caseous pus, smears were prepared and examined under microscope by the Superintendent, Civil Veterinary Department, Assam and found no Tubercle Bacillus.

Pleura:—Normal.

Heart:—Atrophied, anæmic, both the auricles and ventricles empty.

Peritoneal cavity:—Contained clear fluid—about a gallon.

Mesentery and Omentum:—Anæmic, otherwise normal.

Rumen:—Contained undigested ingesta and Amphysotomes in large number.

Reticulum:—Anæmic, otherwise normal.

Omasum:—Contained half digested food and anæmic.

Abomasum:—Anæmic and contained digested food.

Intestines:—Walls anæmic, icterus, fat in small quantity found deposited on the outside of the walls.

Spleen:—Anæmic and atrophied.

Liver:—Decolourised; mucous membrane of the bile ducts thickened and ducts contained inspissated bile and distoma in large numbers.

Gall Bladder:—Contained inspissated bile.

Kidneys:—Anæmic; outer covering icterus; ventricles contained yellow gelatinous substances.

Bladder:—Empty.

Head of this animal was brought to the provincial laboratory for the Superintendent, Civil Veterinary Department's inspection who has very kindly kept the

specimens of nasal chambers with vomer and turbinated bones affected in the laboratory for ready references of our professional brethren. Investigation was made by the Superintendent, Civil Veterinary Department, Assam. Nasal growths were examined in Gauhati Laboratory and specimens were also sent to the Imperial Research Laboratory at Muktesar. No specific germ has yet been discovered but a kind of moulds is said to be the probable cause of it.

Another bullock was also killed on 17th July, 1920, and post-mortem examination held on the 18th July, 1920.

All the organs were found the same as mentioned above except suppurated nodules in the lungs and distoma in the liver.

Treatment:—Various sorts of local treatment for experiment were adopted, but to no effect. By the kind advice of the then Veterinary Inspector, Gauhati Circle, Cupri Sulph solution, Ammoniated Sulphate of Copper solution, Trisulphate solution had been used but no benefit could be derived. Afterwards Pot. Permang, Alum and Argenti Nitras solution also were tried without any effect.

Intravenous injection of 1% solution of Antimony Pot. Tart. was tried at last, having noticed the same stuff injecting in some Surra cases experimentally at Gauhati by the Superintendent, Civil Veterinary Department, Assam, which gave wonderful result.

This unexpected result was duly reported to Mr. Hem Chandra Sen, Veterinary Inspector, Gauhati Circle, and to the Superintendent, Civil Veterinary Department, Assam. Both of these officers very kindly enquired into the result of my treatment and took great interest and gave further necessary advice and help.

Subsequently 2%, 3% and 4% solution in 10 to 20 c.c. doses according to size and age were tried; 2% solution of this drug produced better result at my hand. Those which had been cured by intravenous injections of Anti. Tart. Solution

were found in the same condition and in some cases even worse than before the treatment was adopted, in a year's time. Then the question arose whether those animals had re-infection or recurrence of the disease.

I took up three isolated cases, one at Gauhati and the other two at Dhupatal Village. A few injections to each of them proved sufficient to cure them and they have not as yet got any symptom of this ailment. The Superintendent, Civil Veterinary Department, Assam, and Mr. Cooper, the Imperial Pathologist were pleased to examine the two cows of Dhupatal Village and declared them cured during the last winter. These two cows have been visited by me very recently and found the same as we left them last year.

This shows that those animals which were declared cured of Nasal Granuloma by injection of Antimony Tartaratum solution got re-infection and not recurrence.

Draw back:—Injection of Antimony Tartaratum solution intravenously have been proved in practical field, to be a great heart depressant stuff. Animals with weak hearts as result of some other diseases or having a large number of hydatid cysts in the lungs suddenly succumb after injection. In some cases it produces colicky pain and in some blood diarrhoea resulting in death.

As regards blood diarrhoea, I personally met with in two cases at Majuligaon—these cases were inspected by the Superintendent, C. V. D. Assam, and Mr. Cooper. They had more than five injections each, and as they had not been completely cured I was advised by the Superintendent C. V. D. Assam, to continue injection until complete recovery of them.

They were given injection of 20 c.c. solution of Antimony Tartaratum (7grs-20 c.c.) each, on the 10th November, 1924, as advised; after which both of them got blood diarrhoea and subsequently one expired on the 13th November, 1924, and the other on the 18th November, 1924. On the same day two more cases were injected

with the same solution in 20 c.c. doses to each at Maligaon without producing any ill effect.

The Superintendent, C. V. D. Assam and Mr. Cooper, were good enough to see the last case of blood diarrhoea on the 16th November, 1924, and examined the blood, passed with dung and found innumerable harmful Coccidia. They then suspected that Antimony Tartaratum might have the power of thriving Coccidia and so advised me that before injecting this drug, dung should be examined for harmful Coccidia and it might be used on, when the animal is free from these parasites.

A BRIEF NOTE ON MIXED INFECTIONS AND SIMULTANEOUS ATTACKS OF TWO INFECTIVE DISEASES IN ONE ANIMAL*

BY AZIZ UDDIN SIRCAR,

Veterinary Assistant, Darrang, Tezpur.

I have been in the Veterinary Dept. for more than 18 years and I have never seen such a serious and heavy outbreak of cattle disease like that of the current year. It is, I should say, an exceptionally bad year for the epidemic diseases in my district (Darrang, Assam). Like the last Influenza epidemic in human beings it spread from one corner to the other of my district not leaving a single village, Khuti (Bathan) and Tea Estate.

One thing that seems to me to be more interesting than anything else is the mixed infections and simultaneous attacks of two different diseases in one animal at one and the same time.

In the very beginning of the outbreaks I found some cattle with high fever and nothing else, which, I think can be observed in all the infective diseases and in most of the non-infective diseases on the onset of the disease.

* Read at the first annual Conference of the Veterinary Graduates, Assam, held at Gauhati on the 26th December 1925.

As the diseases were spreading like wild fire and as there were no other symptoms besides high fever, shown by the affected animals, I requested my Circle Inspector, Mr. H. C. Sen to visit my place with microscope for prompt examination of the specimens and to check their further spreading. Before his arrival at my place some animals fell victim to the malady and blood smears were sent to the Superintendent, Civil Veterinary Dept. Assam for favour of microscopical examination and diagnosis and he confirmed the disease as hæmorrhagic septicæmia.

In the meantime characteristic erosion-ulcers of rinderpest developed in some cases and in some other cases minute ulcers appeared in the gums but they were not analogous with the ulcers of rinderpest. Mr. Sen then arrived at my place and visited many of the scenes of outbreaks and we suspected some cases for rinderpest. We also held P. M. examination of a case (buffalo) and we suspected this too to be the case of rinderpest. However Mr. Sen also carried with him some specimens of stomach and intestines to the Provincial Laboratory at Gauhati and showed them to the Superintendent of the Province who declared it as hæmorrhagic septicæmia. The Superintendent however got very much interested of the case, came personally with the Inspector to my place and visited many of the scenes of outbreaks and after examining cases arrived at conclusion that there had been mixed infections of both rinderpest and hæmorrhagic septicæmia and he found the number of rinderpest cases greater than that of the septicæmia and explained that inoculations in such occurrences could not be successful and should not be undertaken and if taken at hand it should be carried on according to the number of cases predominating, that is, if the number of rinderpest cases be greater, preventive inoculation should be carried on for it and vice versa.

During the course of the outbreaks it was also found

that one animal got two different diseases simultaneously at one time. In one of the outbreaks the Superintendent of the Civil Vety. Dept. wanted to examine a sick cow which had high fever and difficult breathing. At the attempt of opening its mouth by me for the examination by the Superintendent the animal fell down and collapsed very suddenly. We held P.M. of it and the Superintendent was interested to see that this animal was suffering simultaneously from bovine contagious pleuro-pneumonia and rinderpest.

Smears of blood also were sent to the Superintendent of the Civil Vety. Dept. from another typical case of rinderpest which also showed some unusual symptom like that sometimes shown by the cases of hæmorrhagic septicæmia. It was however proved to be the case of hæmorrhagic septicæmia microscopically by the Superintendent. A reference was made to the Superintendent who kindly informed me that the animal had an attack of rinderpest as well as hæmorrhagic septicæmia.

So it is quite evident from the above mentioned 3 cases that one and the same animal can get two different infective diseases at one and the same time which is not always found in the practical line.

It will not be out of place to mention here about the unusual prolongation of the diseases in these outbreaks this year. It lasted for more than one month and even two months in one place and in one outbreak. Recurrences of the outbreaks were also noticed in many places.

As it seems to me to be very interesting I read this paper before my professional brethren who have very kindly attended this Veterinary Graduates' Conference in Assam.

URINE AND ITS EXAMINATION *

BY J. M. BHATT, G. B. V. C.

Offg. Deputy Superintendent (C. V. D.) C. P.

- (1) Physically.
- (2) Chemically.
- (3) Microscopically.

(1) Physical examination is undertaken to ascertain (a) Quantity (b) Colour and Transparency (c) Consistence (d) Odour (e) Density (f) Naked eye characters of deposits.

(2) Chemical examination is done to find out (a) Reaction. (b) Nitrogenous constituents as urea, uric acid, hippuric acid, ammonia etc. (c) Non-Nitrogenous constituents as chlorides, phosphates, sulphates, oxalates etc. (d) Abnormal constituents as albumen, sugar, bile, bile pigments, bile acids, pus etc.

(3) Microscopical examination is undertaken to detect the presence of (a) unorganised deposits as uric acid and its salts, hippuric acid, oxalates, tyrosin, cystin, leucin etc. in acid urine and phosphates, urate of ammonia carbonates etc. in alkaline urine (b) Organised deposits as red blood corpuscles, leucocytes and pus corpuscles, fat particles spermatozoa, epithelium tube casts and parasites non-pathogenic as fungi and pathogenic as Tubercle bacillus.

Characters of normal urine.

HORSE:—

Quantity varies according to diet, amount of water consumed, season and work.

It is increased on a highly nitrogenous diet and the larger amount of water consumed on account of nitrogenous diet. The amount is also increased in winter owing to reduced action of the skin. The quantity is lessened in horses at work and in warm weather due to

Paper read at the second annual conference of C. P. and Bihar Veterinary Association.

increased action of the skin. The usual quantity varies from 8½ to 20 pints daily.

Colour and Transparency :—

This may be clear yellow, brownish yellow, deep yellow or yellowish red and on exposure to the air it rapidly turns brown. Certain forms of diet influence the colour, thus on green food it may be yellowish white. If large amounts of red carrots are allowed, colour may be brownish red which may be mistaken for pathological condition.

Translucency :—

Generally turbid due to suspended carbonate of lime and magnesia.

Very rarely clear and then only for a short time, as the urine cools, the degree of turbidity becomes intense especially when it undergoes ammoniacal fermentation.

Consistence :—

It is important to remember that under certain conditions, alterations may occur in the consistency of the urine in healthy animals which may be mistaken for the disease.

Some mares excrete a glairy tenacious urine which, owing to the mucin it contains, can be drawn out in strings; not uncommonly it is found as thick as linseed oil especially during œstrum. On an exclusive diet of oats, the urine gets so mucinous as to pour like white of the egg.

In the pelvis of the kidney a material is found composed of the natural mucus of the urine mixed with insoluble lime salts which resembles pus in appearance and may be mistaken for a pathological condition.

Odour :—

The slightly aromatic odour of the horse's urine is said to be due to certain substances of phenol group.

A distinct though faint smell of ammonia is present

in fresh urine. This may be due to fermentive changes occurring in the urea before the urine is passed.

Reaction :—

Alkaline due to carbonate of potash. If the horse be fed on oats, the reaction becomes acid probably due to the formation of acid phosphates from the food.

Specific Gravity :—

It varies according to the diet and the amount of dilution. The average is 1036, the highest 1050 and the lowest 1014.

OX.

Quantity :—

The amount secreted is larger than in the horse being from 10 to 40 pints in 24 hours.

The more nitrogenous the diet, the larger is the amount of water consumed and hence the quantity of urine is increased.

*Colour :—*It is clear yellowish.

*Odour :—*It has an aromatic odour.

Reaction :— Alkaline.

In suckling calves the urine is acid and is rich in phosphates, uric acid, creatinine and a peculiar substance allantoin, it is poor in urea and contains hardly 1 per cent of solids.

The nitrogenous matter is mainly represented by urea and hippuric acid.

The phosphates are either absent or only occur in small quantities.

Specific Gravity.

It is lower than that of the horse being 1007 to 1030 due to larger amount of water secreted.

DOG :—

Quantity :—

The amount excreted varies with the size of the animal and the nature of the diet and is estimated at ¾ to 1¾ pints daily.

*Colour :—*pale yellow to straw yellow.

Reaction:—It is acid when the animal is on flesh diet, acidity being due to acid phosphates of soda; on vegetable diet the reaction is alkaline. Specific gravity is from 1016 to 1060 depending on the diet.

Constituents:—

The amount of urea varies from 4 to 6 per cent.

Uric acid (combined with soda and potash) is excreted when the dog is on animal diet but disappears if vegetable food be given. Amongst other constituents are hippuric acid in small quantities, indican, phosphoric acid and a substance known as glycuronic acid which though exists in traces exerts a reducing action on salts of copper and therefore one cannot regard urine which possesses a similar action as necessarily containing sugar. Glycuronic acid is obtained in well marked quantities of the urine after the administration of such drugs, as camphor, chloral, phenacetin, morphine, chloroform etc.

Tests for Albumin:—

(1) *Heat and Nitric acid test*:—

A small amount of urine is boiled in a test tube over a spirit lamp and a drop of nitric acid is then added. If on boiling, cloudiness occurs which is not dissolved on the addition of an acid, albumin is present.

Acetic acid may be substituted for nitric acid in the above test.

(2) *Heller's Ring Test*.

Pour a small quantity of fuming nitric acid into a test tube and with a pipette allow the urine to flow gently down the side of the tube upon the acid. At the line of junction of the two fluids a white ring is formed, the depth of which, varies according to the amount of albumin present. This test is reliable for clinical work and is said to demonstrate the presence of 0.02 per cent of albumin; a colouring ring forming at the junction of the acid and urine is due to oxidation of the colouring matters in the urine.

(3) *Millard's Fluid Test*.

This is an extremely delicate test for the detection of minute traces of albumin.

The reagent is prepared thus:—

Glacial Carbolic acid (95%) 2 drams.	} Mix
Pure acetic acid.....7 "	
Liq potassae.....2 ozs & 6 "	

It is employed by the contact method as in Heller's test.

Quantitative estimate of albumin.

This is accurately carried out by means of Esbach's albuminometer.

A rough method consists in boiling a certain amount of acidulated urine in a test tube and allowing it to stand until cool. By comparing the depth of the deposit with the whole quantity of urine in the tube, an approximate idea may be gained of the amount of albumin present such as a mere trace, one fourth, one half, solid etc.

It is necessary to distinguish renal albuminuria from the spurious type.

In the renal albuminuria, tube casts, epithelial casts, hyaline casts etc will be present in the urine besides albumin. In the spurious type, a copious organic sediment containing epithelium derived from urinary passages is present with only a small amount of albumin.

(5) *Bile in the urine*.

Iodine Test for bile:—

If a 10-percent alcoholic solution of iodine is poured on the top of the urine in a test tube, an emerald green layer appears where two fluids join, if bile is present.

Bile pigments in the urine.

They are found in the urine in icterus. The urine may then be of a dark yellow, lemon, brownish yellow or greenish yellow colour and if a portion of white filter paper be dipped into it, a yellow stain is produced.

Gmelin's Test.

A portion of the suspected urine is slowly added to

some nitric acid containing a few drops of nitrous acid so that the urine forms a layer above the acid. If bile pigments are present, a play of colour is observed where the liquids meet, green being most marked.

Rosenbach's Test:—

This is a modification of Gmelin's test. A portion of filter paper moistened with the suspected urine is placed upon a white porcelain slab and is touched with a glass rod previously dipped in fuming nitric acid.

If bile pigment be present a ring of colours is observed at the point of contact. These colours from within outwards are yellow, violet, brown and green; the green is only obtained in some cases.

(6) *Glycosuria*—sugar in the urine.

The blood of healthy animals contains about 0.1 per cent of grape sugar and it is possible to find traces of sugar in the urine of cattle and sheep known as physiological glycosuria.

The occurrence of glycosuria as the result of ingestion of sugar-alimentary glycosuria has not been demonstrated in animals.

Sugar is detected in the urine of nursing animals following a sudden suppression of milk secretion or milk fever in cattle but it has been proved that milk sugar is present in many instances and the term 'Lactosuria' is then applied. Glycosuria or Diabetes mellitus is of rare occurrence in animals but a number of cases have been recorded in recent years.

The urine is pale in colour, has a sweetish odour and in some instances where marked polyuria is present, it resembles water.

The specific gravity is increased and varies between 1050 and 1060,

The amount of grape sugar present, varies in the horse from 3 to 7 percent and in the dog from 4 to 10 percent. Reaction is normal. In the early stages the

sugar may temporarily disappear from the urine but when the disease advances glycosuria gets permanent.

It is increased by the ingestion of sugar or starchy foods and lessened on a nitrogenous diet. The following are some of the tests employed for the detection of sugar in the urine.

Fehling's Test:—

The following solution is prepared.

Sulphate of copper	—	—	grains	90½
Neutral tartarate of potassium	„			364.
Solution of caustic soda			ozs.	4.
Distilled water	—	—	to make	ozs 6

The solution should be freshly prepared as it is apt to decompose.

One drachm of this solution is placed in a test tube and boiled and to this solution is added a drachm of suspected urine; the mixture is boiled again.

If sugar be present the yellow sub-oxide of copper is thrown down as a precipitate.

Fermentation Test:—

This is the most accurate and reliable test. A small fragment of yeast is placed in a test tube full of suspected urine. The test tube is then inverted over a glass vessel also containing urine.

If sugar be present, fermentation occurs and carbon dioxide is formed which accumulates in the upper part of the tube and expels the urine therefrom. Specially devised fermentation tubes can be obtained for carrying out this test.

Nylander's Test:—

Nylander's solution is prepared as follows:—

Rochelle salts.....4 grammes

Solution of caustic soda (10 percent) 100 C. C.

Dissolve; next add 2 grammes of bismuth subnitrate and digest in a hot water bath until as much as possible of the bismuth salt is dissolved.

Add 1. C. C. of this solution to 10 C. C. of suspected

urine and boil for 5 minutes. If sugar be present, a black deposit of bismuth occurs. This is due to the reduction of the subnitrate of bismuth to the metallic bismuth.

(7) *Hæmaturia* :—

It signifies blood in the urine and may be met with in Piroplasmosis, Purpura Hæmorrhagica and in certain cachectic states of the system, and also in connection with the morbid alterations in the kidneys as acute renal congestion, acute nephritis, rupture of the kidney, new-growths, renal calculi, affections of the urinary passages and parasites; certain agents as oleum turpentine in large doses, carbolic acid and cantharides also cause hæmaturia.

Character of the Urine.

It may be smoky or bright red or a dark port colour. In many cases in addition to red blood corpuscles, the urine may contain hæmoglobin in solution due to destruction of blood corpuscles. This occurs more readily in ammoniacal urine or when the latter is of low specific gravity. The sediment is light or dark red in colour and may contain blood corpuscles.

In some cases blood clots are present; on microscopical examination red blood corpuscles can be recognised easily. They may retain their colour, be free or aggregated in masses and of crenated appearance or may occur as simple shadows or may be embedded in casts of the uriniferous tubes.

It is important to ascertain the source of the hæmorrhage if it originates from the kidneys, blood and urine may be mixed and epithelial cells and various casts may be detected in the urine. Blood casts may be present when bleeding is profuse; if it is from the bladder, blood may only be found with the last portion of the urine passed or at the termination of micturition. When the bleeding is from the urethra due to calculus, the blood may escape in the intervals between micturition or may appear as a

small clot at the commencement of the act or may be passed during the straining attempts to urinate.

(8) *Hæmoglobinuria* :—

In this condition, the blood pigment occurs in the urine and is due to the breaking down of the red blood corpuscles or the elimination of the pigment from the blood cells or both processes combined. Some regard this as a symptom of Hæmoglobinemia. It occurs in Piroplasmosis, more rarely in Trypanosomiasis and is as the result of administering large doses of Pot. Chloras, Phenacetin, Naphtaline etc.

Spectral-Analytic or Heller's test :—

This is suitable for demonstrating oxy-hæmoglobin or met-hæmoglobin present in the urine; in the case of the former two absorption bands are present and in the latter three, the one in the red near=C-being characteristic.

(9) *Pyuria*.

This signifies the presence of pus in the urine. The condition occurs in renal abscess, purulent nephritis and uterine and vaginal catarrh. In cases where a pelvic or perirenal abscess ruptures in the urinary passages, a large amount of pus is excreted in the urine within a short time and then rapidly diminishes or may cease abruptly.

In pyuria urine is of a whitish or yellowish white appearance and may be of strong ammoniacal odour and the sediment may be ropy in character.

Test for Pus.

Urine which contains pus, gives on the addition of Guaic alone, a green colour which disappears on heating. If caustic potash is added to the deposit of pus, a ropy gelatinous mass results. On microscopical examination a large number of pus corpuscles are detected, these when pus originates in the bladder are well formed; associated with pus are epithelial cells from the bladder and pelvis of the kidney.

(10) *Uræmia.*

This may be regarded as a toxæmia occurring in connection with certain renal affections or conditions where the discharge of the urine is interfered with; the latter include obstruction of ureters, neck of the bladder, urethral calculus etc. Owing to the interference with the function of the kidneys or with the discharge of the urine, the excrementitious materials which should be removed from the body—accumulate in the blood and exert toxic effects. Another thing put forward is that uræmia is due to the products of abnormal metabolism.

The toxic agent responsible for the production of *Uræmia* is an albuminous product quite distinct from any constituent occurring in the normal urine. Meningites may be confounded with uræmia. The only means of distinction are a chemical and microscopical examination of urine.

(11) *Organised Casts in the Urine.*

A "Cast" is the term applied to a model of a hollow organ such as a renal tubule and is formed by effused plastic material.

The presence of organised casts in the urine points to the existence of an acute or chronic inflammation of the kidneys.

The following varieties of casts are recognised:—

(a) *Blood casts:—*

They are filaments of coagulated fibrin enclosing blood corpuscles. In some instances the red or white corpuscles may amalgamate to form a cast but more frequently they are found irregularly studding a fibrinous mould.

(b) *Epithelial casts:—*

They are formed of columnar renal epithelium or of round cells.

The casts are generally composed of coagulable material containing epithelial cells.

(c) *Fatty casts:—*

They are made up of material consisting largely of fat globules. They are transparent or of a dark granular appearance and are dotted over with minute oil drops.

(d) *Hyaline casts:—*

They are rarely transparent and are composed of a homogenous proteid material which is slightly refractive.

Darker looking hyaline casts are sometimes called "Waxy" they are solid and highly refractive.

(e) *Renal casts:—*

They are cylindriform bodies derived from any of the collecting tubes or loops of henle.

(f) *Tube casts:—*

This term is applied to any casts of a renal tubule found in renal diseases.

(12) *Epithelium in the Urine.*

This may be derived from the renal pelvis, the uriniferous tubules, the ureters, the bladder, the urethra or the vagina. The source is determined by the prevailing type of cells, by the presence or absence of casts and by the accompanying symptoms. The detection of organised casts, epithelium etc., is carried out by a microscopical examination of the urine. The microscopical examination of the urinary deposits, parasites etc. will be discussed in detail, hereafter, when suitable opportunity presents itself.

CLINICAL ARTICLES

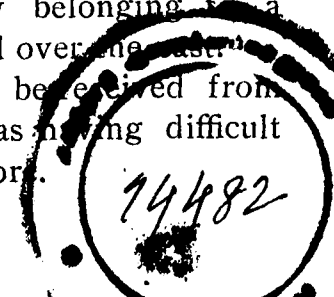
A CASE OF CHRONIC CYSTITIS IN A PONY

BY M. V. PILLAI, G. B. V. C.,

Asst. Vety. Surgeon, Munc. Vety. Dept., PENANG

*Subject:—*A Bay Australian pony belonging to a circus company which had travelled all over the East.

*History:—*No definite history could be received from the owner, except that the animal was showing difficult urination for the past one month or more.



Symptoms:—When the animal was admitted to the infirmary on January 14th of this year symptoms were as follows:—

Stiffness of the loins, unsteady gait, micturition painful and imperfect, urine dark coloured and foul smelling, containing fragments of necrotic tissue, pus and blood clots, painful defecation resulting in retention of faeces in the rectum and retention of urine on examination. Appetite was very good throughout and there was no rise of temperature. In the stall it used to rest its head always on some object. The fore legs used to shiver while standing and comotose condition was very prominent.

Though the prognosis was unfavourable, perfect rest and nourishing and liquid food were given by way of treatment. A small quantity of urine was removed by passing catheter.

Urotropine was tried for 2 or 3 days with no good effect. As the case was a very chronic one and as the circus company was leaving this place the owner gave his consent to have the animal destroyed.

Post mortem symptoms, were interesting. The carcase was well nourished with plenty of fat in spite of long suffering. Lumbar muscles above the right kidney were atrophied with hæmorrhagic spots all round, slight enlargement of right kidney, which, when cut open, revealed marked inflammation of the interstitial tissue. Urethra was inflamed at its upper third. Wall of the bladder was highly thickened nearly four or five times its normal thickness showing that the condition was a long standing one. Whole of the mucous membrane of the bladder was covered with a thick layer of necrotic membrane under which there was considerable inflammation. Contents of the bladder were so very foul smelling and dirty that any one would vomit.

Remarks:—

I. This kind of case is not always within the reach of Veterinarians.

2. Being a circus animal, retention of urine might have been the cause of this affection.

3. The animal was never off feed till destruction and kept up very good condition.

TRYPANOSOMIASIS IN A BULLOCK

BY MR. M. V. PILLAI, G. B. V. C.

Sudden death of an old Indian bullock belonging to a P. W. D. contractor was reported to me during the middle of July, 1925, and as it is compulsory by rule, to take all dead animals from the municipal area to the knackery for postmortem examination, the owner was asked to remove the animal there accordingly.

After post mortem, nothing could be observed except that of extreme emaciation of the body and paleness of the internal organs, and so I thought of taking a blood smear which was stained and examined under microscope, when numerous Trypanosomes were found. On enquiry from the owner, I came to know that the animal was getting very thin and so discontinued from work for some time. One night after his usual feed, the animal suddenly developed symptoms of violent excitement, struggled for some time, was thrown away a few yards from the shed and died.

One of his other bullocks died the same way during work two months before this incident. Many animals have been dealt with at the knackery for the last 4 years of my service, and this was the first time I came across a case of this nature. This disease does not seem to be so very common in this island of Penang, but this particular animal, being brought down from India, must have been harbouring the parasites for a long time without showing symptoms of ill-health.

A FEW CASES OF DEBILITY IN DOGS
DIAGNOSED AS FILARIA IMMITIS
AFTER P. M. EXAMINATION

BY M. V. PILLAI, G. B. V. C.,

Asst. Vety. Surgeon; Munch. Vety. Dept., PENANG.

I shall briefly narrate, for the information of the profession, some cases of debility in dogs due to 'Filaria Immitis,' which I came across during post mortem examinations for the last 2 years.

Case No. 1. A brown dog sent to the infirmary for mange treatment during March, 1925. Debility was the prominent symptom, which, I thought, may be due to severe irritation of the skin caused by mange parasites. The mange treatment, having been finished, sent the animal to the convalescent ward, where also, it was not improving in condition as expected, in spite of good food and great care. One morning, it was reported, the animal, after having the usual feed, suddenly fell down, growled, vomitted once and died after some time. Postmortem examination revealed 14 worms from the heart varying from 10-12 inches in length. Heart was enlarged.

Case No. 2. Admitted for mange again on 5-5-26 and the treatment was only finished. Found the animal dead on the 13th morning without showing any symptom of ill health except debility. Post-mortem examination showed 8 worms from the heart, and enlargement of the heart.

Case No. 3. Admitted for debility on 28-6-26, with a fairly good appetite. The animal was dull with no rise of temperature. Microscopical examination of stools proved negative for hook-worms. Hanging drop preparation of blood, when examined under microscope, revealed innumerable parasites. As the case was incurable, owner consented to have the animal destroyed.

On post mortem examination 3 worms were removed from the heart.

Case No. 4. Another dog was admitted for mange on 8-7-26, debility being a prominent symptom. Sent to the convalescent ward as usual, after having been treated. Here, one night it was reported that the animal vomited, growled with great pain and died immediately. On post mortem, besides the enlargement of the heart and serus effusion 4 worms were detected.

Conclusion.

1. Debility and enlargement of the heart were the prominent symptoms observed in the above cases.

2. This affection in this country appears to be common, probably due to the surface water which is supposed to contain the immature form of the parasites.

“EPHEMERAL FEVER” OR “THREE DAYS
SICKNESS IN CATTLE.”

BY UDEY SINGH, G. P. V. C.,

In charge of Sadar Vety. Hospital, Shahjahanpur.

Ephemeral fever is not a new disease in this country; it spreads in the rainy season in the northern part of India as well as in the southern. In vernacular it has been called by many local names, such as jar, arhai, dinka bukhar and bilgaya etc. Every cattle breeder or agriculturist knows well about this disease, but does not care too much for it as the disease runs through its course without any mortality. The disease is not described in Veterinary text books but its existence is reported to have been in the southern and the central parts of Africa “the heart of Africa” written by Dr. George Schwinfurth in the year 1867 and an article on this disease has been given by Mr. G. W. Freer, M. R. C. V. S., in the Agricultural Journal of the Cape of Good-Hope. A brief note about it has been given in volume I No. 2 page 123 and volume II No. 2 page 99 of the Indian Veterinary Journal by Mr. C. V. R. Chetty and Mr. P. C. Kunar respectively. On many occasions I

have treated a lot of cattle suffering from this disease in the districts of Kheri and Shahjahanpur in the United Provinces. Fresh cases which I have met with to treat in Shahjahanpur are as follows;—

1. 19-7-1926. Bullock belonging to Government Agricultural farm, Shahjahanpur.
2. 19-7-1926. Bullock belonging to Sheo Raj Singh of Village Anthapur, O.P. No 762.
3. 23-7-26. Bullock belonging to Govt. Agricultural farm, Shahjahanpur.
4. 29-7-26. Male calf belonging to S. Arjan Singh O. P. No. 831.
5. 30-7-26. Bullock belonging to Govt. Agricultural farm, Shahjahanpur.
6. 30-7-26. Bullock belonging to Budha c/o Jilani, Shahjahanpur. O. P. No. 835.
7. 1-1-26. Bullock belonging to Manohar c/o Narainji village, Anthapur. O. P. No. 854.
8. 10-8-26. Bullock belonging to Kundan c/o Likha village, Piprola. O. P. No. 934.
9. 17-8-26. Bullock belonging to Hinga Khan c/o Bodullah Khan, Shahjahanpur. O. P. No. 985.
10. 18-8-26. Cow belonging to Padri Mohan Singh, village Kamlanpur. O. P. No. 992.
11. 19-8-26. Bullock belonging to Municipal Board, Shahjahanpur O. P. No. 1001, and three bullocks treated on tour in village Nagla Banwari belonging to Hira Singh, Raghubir Singh and Agne Singh on 17-8-1926. On account of this experience of mine I dare to write these few lines on this disease—ephemeral fever—which, I hope, will not be unsuited to the interests of the readers of this esteemed journal.

Ephemeral fever is due to the entrance of a specific organism into the system. It is said that an insect of greenish colour, which breeds on green grass in the rainy season, is swallowed up with the grass by the cattle and hence the disease. But I have never seen the insects.

On the contrary I have seen the bullocks suffering from this disease, which are fed on chaff or dry fodder in the stalls. I therefore do not agree with the theory that the disease is due to swallowing a certain insect with the grass. Nevertheless I am of opinion that this disease is due to a specific organism. The disease attacks the well fed and fat cattle, bullocks, cows, and calves.

Symptoms:—

The earliest indications of an attack are, loss of appetite and suspension of rumination, a rise of temperature with roughness of the coat and a watery discharge from the eyes and nose. In a few hours these symptoms rapidly develop when the temperature reaches 106°. F, shivering, quickened heaving respiration. Mucous membranes of the mouth become reddened. There are also found the following characteristic symptoms, discharge of saliva, and also the extreme helplessness, with the evident disinclination to move unless assisted, stiffness of one or all the extremities and usually of the whole body, lameness which may pass from one limb to another. When the animal lies down he is unable to rise up. Bowels constipated fæces being covered with strings of mucus. In about forty eight hours the temperature falls nearly to normal, appetite returns, and acute symptoms disappear.

Mortality. Nil, if any, it is due to some complication such as pneumonia etc.

Immunity. One attack cannot save the animal from another attack.

Treatment. I have tried all the medicines such as simple fever mixture with Mag Sulph and tonics, Nuxvomica, Gentian, Ginger, Black pepper and Chiretta etc., with jaggery. But in my opinion no medicine should be given in draught as the animal is unable to swallow it owing to stiffness of the neck muscles. I recommend keeping the animal in warm ventilated shady place, attending to its general comforts, and leaving the rest to nature. As far as preventive measures are concerned, nothing is known at present.

STRINGHALT IN CATTLE OR MANDAGUDI (OR KHOLYA)

BY BABU K. S. SANKARAM,

Touring Veterinary Assistant Surgeon, Soro.

It was a condition recognised as almost incurable till a few months ago. The diagnosis of the disease is very simple; it may affect one hind leg or both, and it may exist since birth, or the animal may acquire it subsequently.

The *cause* is not definitely known till now. Some attribute it to an affection of muscles, and some to the nerves, particularly the sciatic nerve of the hind limb. Some say that it is mechanical due to the spine of tibia growing abnormally. Mr. Gouboux directed attention to joints especially to hip joint. But the result of the present treatment leads one to think that it is a condition affecting the stifle joint, mostly the Femoro-Petallar articulation.

Treatment:—The treatment was found unsatisfactory. Blisters, firing, tenotomy (Peroneal) etc are of no use. Injection of Tr. iodine into the stifle joint is giving very good results. Thanks are due to Mr. Prakasa Rao G. M. V. C. of Vizagapatam, who tried and published the treatment for adoption by the members of the profession in the Indian Veterinary Journal. I tried this method in 3 cases and found it successful.

The Technique of the operation:—Let the animal be laid on the sound side and legs secured. Clip the hair over the stifle joint of the affected leg, wash and dry the part, and apply Tr. Iodine. Pass an aseptic inoculation needle through the depression found on the supra-external part of the patella, right deep into the joint, and empty $\frac{1}{2}$ the dose of Tr. Iodine mitis through the needle—the dose being 10 to 15 c. c. according to the size and age of the animal. Draw out the needle. Again get

into the joint from 3" below the 1st seat of injection; and empty the remaining half dose. Take out the needle, untie the legs and let the animal be free. If both legs are affected, treat the 2nd one also in the same way.

After-treatment:—The animal should be completely at rest for 20 days. Within 4 days after the day of injection a small swelling of the stifle joint may be noticed; and it could be made to subside by any antiphlogistic application. No other complications need be anticipated. The result in most cases would be permanent cure; but few cases may require 2nd injection after 20 days and rest as before. The cure then would be certain.

I shall be grateful if some other members of the profession try this treatment and publish their results in the Indian Veterinary Journal for universal adoption.

FEW INTERESTING CLINICAL NOTES.*

BY P. S. SUNDARAM, G. B. V. C.

Veterinary Assistant Surgeon, Nagpur.

I. MAL-PRESENTATION AND USE OF PITUITRIN IN FELINE PRACTICE

I was called in to see a Siamese cat suffering from dystokia, the property of Miss Butler. When I went there I saw that the cat had given birth to two kittens and I found the tail of the third one presented. On enquiry I learnt that the animal was suffering like this for about two hours and in the previous delivery in England also she had some trouble, which had to be overcome by Veterinary aid. This convinced me that this was a case of uterine inertia; and immediately 5 c. c. of pituitrin was injected subcutaneously with the usual antiseptic precautions, and within 5 minutes the animal gave birth to a dead foetus with all its coverings intact. The foetus

* Read at the Second Annual Conference of the Central Provinces and Berar Veterinary Association, April, 1926

presented a peculiar malpresentation of both the fore-limbs brought over the head on one side, namely left. Specimen of this foetus with all its coverings in tact has been preserved in the central C. V. D. laboratory. As far as I can recollect I cannot find this peculiar sort of presentation described in any obstetric book. After 15 minutes, the cat gave birth to one more kitten alive without any trouble. On palpation I was not able to feel any more foetus. Still I waited there for about half an hour. Then I returned after giving instructions to administer one tea spoonful of brandy mixed with milk three times a day, for two days.

The animal improved rapidly without any further treatment. To my great wonder all her young ones including the last born one are healthy.

II FOREIGN BODY IN THE THROAT OF A CAT.

On the 31st January, 1926, a cat belonging to Dr. Dass was brought to the hospital with the history that the animal was not taking its food properly for the last 7 days. Mouth was half opened and there was dribbling of saliva. There was also a suppressed hollow cough as if the animal is trying to expel something from the throat. One may at first sight, mistake the case to be of rabies but for the history. Anyhow to be on the safer side my assistant and myself were protected with leather gloves and after securing the cat with hobbles on the operation table the mouth gag was applied. With a tongue depressor the tongue was kept in position; and the throat on examination, revealed a foreign body white in colour. It was removed carefully with a pair of long forceps. To my surprise it was found to be a fish vertebral bone with all its spinous processes. This bone is preserved in the central C. V. D. Laboratory. The wound in the throat was dressed with hydrogen peroxide and the owner was instructed to give milk diet. The wound healed rapidly and the animal started taking usual food after two days.

III TREATMENT OF CAPPED ELBOW IN A HORSE.

A horse belonging to Rai Bahadur Bansilal Abirchand was treated for capped elbow for about a month with Tr. Iodine and then with Acetic Acid and chalk paste to no purpose. As a last resource with the permission of the owner and at the suggestion of the Veterinary Inspector Mr. P. S. Nair, it was decided upon to operate.

The tumour was a hard one on the point of the near elbow about the size of a big orange. The animal before operation was protected with anti-tetanic serum. Hairs on the tumour were clipped and painted with Tr. Iodine. The animal was controlled with a twitch on the lip and the off foreleg was held raised by an assistant while the hind legs were secured by sidelines thus making the operation possible in a standing posture. Four points at equidistance from a central spot of the tumour were marked. Then from the first point to the next adjoining point a curved suture needle was passed piercing the skin and the tumour, and was brought out at the next point so as to have its concavity outside and the two loose ends of the silk thread were brought together and tightened with a slip knot. In the same manner the rest of the sides of the tumour were dealt with.

Daily the part was cleaned with antiseptic lotion and the knots were gradually tightened. In due course the four points came closer and closer and the base of the tumour became very thin and the tumour was actually suspended on a small stalk. At this stage it was quite easy to cut and remove it at the base with no bleeding. Afterwards the wound left in its place, healed easily with dry dressing, leaving no trace of any pouch.

The great secret of success in this operation depended on the careful measures taken in not allowing the new-forming granulations adhering to the wound and thus retarding the separation of the tumour from the body. This was accomplished by just pulling the threads every

day during tightening, to and fro, a few seconds. The animal was cured and discharged with instructions to the owner to use sufficient bedding and to provide a rubber ring during nights as a preventive.

Till now I had no opportunity of trying in such cases the purse string sutures and I cannot say whether it would be a success in cases of fibrous tumour of this size.

IV. EXCISION OF EYE-BALL IN DOG.

In two dogs one eye-ball in each was removed for glass-eye at the request of the owner in this hospital and it was performed in the following manner.

First of all, the animal was prepared for operation by giving a dose of *Ol. Recini*. The next day the animal was secured on the operation table with hobbles. *Lotio. Atropine sulph* 1 in 110 was applied to the eye and after 5 minutes the operation was started. To facilitate the operation a string was passed through the membrane which unites the eyelid both upper and lower. They were held apart by my assistant. Then with a curved blunt-pointed scissors the eyeball was separated from its attachments at the inner canthus; and the Optic nerve was cut. Then quickly all the other attachments to the eye-ball were severed and with gentle pressure the whole eyeball with fat was completely removed from the orbit. The cavity was cleaned with Hydrogen Peroxide.

The edges of the eyelids were trimmed and sutured with silk ligature. A pressure bandage was applied over. Every day the wound was dressed with Hydrogen Peroxide and bandage renewed. On the 5th day the sutures were removed and dry dressing powder was used and on the 10th day the animal was discharged cured. This method is by far preferable to the old open method.

V. REMOVAL OF URETHRAL CALCULI IN A BULL TERRIOR DOG.

On the 15th February, 26, a bull terrier dog belonging to a retired Deputy Commissioner Mr. Harper Collins, was

brought to the hospital from Kamptee with the history that the animal used to bleed from the genitals prior to urination and from the previous day it had not passed even a single drop of urine. The animal was straining with no effect and showed great discomfort. The animal was raising one of its hind legs as if to urinate but not a drop of urine was coming and the animal was haggard in appearance.

I tried to empty the bladder by gentle pressure upon it through the wall of the abdomen without any effect. Then I secured the animal on the table gently with the hobbles; and on examination found no growth. The prepuce was pressed, but nothing came out of the urethral orifice. Then an elastic, dog catheter smeared with vaseline was gently passed. Just when the catheter reached the penial portion of the urethra, slight obstruction was felt and gentle pressure had to be used to push the catheter up to the curvature of the perineal arch. As soon as a few drops of urine mixed with blood dripped out, the catheter was removed. Immediately with a jerk, all urine in the bladder was expelled bringing with it, the obstructed calculi. These calculi have been collected and sent to the central C. V. D. Laboratory. There was slight bleeding after urination. The urethra was cleaned with *Pot. Permang.* Lotion and the following prescription was given for four days.

Rx.

Ext. Hyoscyamis Viridi }
Acid. Boricum } aa grs. V.

Mft. Electuary Sig. B. D.

During the course of this treatment, at owner's cost a Y shaped double canalled urethral tube was procured and every day the urethra was thoroughly cleaned with *Pot. Permang.* Lotion 1 in 2000 twice daily.

The diet for the dog was purely milk and bread only. For the first two days the urine was reddish in colour and

on the 4th day, the flow and the colour of the urine resumed to the normal.

Then the animal was discharged with instruction to the owner that he should avoid giving food containing much of Calcium salts and particularly prohibit altogether giving meat ration. Till now the animal had no further trouble and is quite normal.

MICROSCOPICAL EXAMINATION OF BLOOD SPECIMENS.

BY V. R. GOPALKRISHNAN, G. M. V. C.,

Lab : Vety : Assistant Surgeon.

Among the various diseases which affect the domesticated animals, those which are caused by pathogenic organisms which directly or indirectly get into the blood stream require a more careful consideration, a quicker diagnosis and earlier remedies. In such diseases the organisms gain an upper hand in spite of being attacked at every step by the naturally provided safeguards of the animal economy. The result is that the condition of the animal deviates from normal, caused by the nutrition of blood being utilized by the invaders. Hence it behoves us to find out the nature of the pathogenic organism, the manner in which it gains access, the means of its destruction either medicinal or otherwise. Disease of this type demands very prompt action as hasty conclusions or unnecessary delays alike lead to disaster. So, correct diagnosis of the disease is of prime importance before making an attempt at any sort of treatment. This being the first duty of us all, the ways and means for reliable diagnosis cannot be overlooked. Of the many ways of diagnosis, the surest possible may be considered to be with the help of a microscope. For an examination under microscope various specimens are necessary

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depending upon the nature of the disease. But now as I am concerned with the specimen of blood only, I propose to give you an idea of the manner of taking it. It should be remembered that particular care is essential while preparing a specimen as this helps a good deal for an easy and correct examination.

For making blood smears we have to select a convenient site, such as ear or face, the former better. The hair should be clipped, the site well washed, and then dried thoroughly. A small incision is made in the skin by means of a sharp clean lancet or knife, and then wait until the blood oozes freely from the small wound and collects in the form of a drop. If the blood does not come, it is better to make the wound a little deeper than to squeeze the edges of the wound. Now by means of the point of a clean knife lift a small drop, or better a portion of it or a droplet of the freshly oozing blood and place this drop about the middle or preferably near one end of a perfectly clean glass slide of thin variety. It is better to avoid thick glass slides as they are more troublesome during examination requiring extra adjustments accountable for refraction caused more by the thicker type. Now take another clean slide with straight smooth edges at its ends and place one end on the slide on which the drop of blood has been placed and just in front of the drop. The upper slide is held firmly at an angle of about 45° with one edge thus placed firmly and flat on the lower slide which is held carefully on the other hand. The lower end of the upper slide is now brought back into contact with the drop of blood which spreads by capillary attraction gradually along the edge of the slide. When the drop has spread nearly to the outside of the edge the upper slide is propelled forwards at a uniform pace, without shirk or stoppage, bringing, along with it, by capillary attraction, the drop of blood and leaving behind a thin uniform film of blood on the surface of the lower slide. As soon as the smear is taken in this way it must be dried

quickly and thoroughly by rapidly waving it about in the air for a few seconds. A couple of such smears from each case is preferable. Then they are rolled in a paper by separating each slide with a thin strip of wood as match stick to avoid concussion and breakage. Again a paper is to be wrapped over this and kept in a box, then packed well with cotton wool and sent for examination.

Now the next question to be considered is for what disease such smears are required and the method of their examination.

Anthrax. In this case the smears should be taken from the auricular vein immediately before or after death as the Anthrax bacilli are found in the peripheral blood only a very short time previous to death. As the organism belongs to the aerobic group they commence to degenerate for want of oxygen subsequent to the death of animal, if kept unopened. When opened or when the organisms come in contact with air or free oxygen, sporulation takes place which is not possible when the animal is alive or in an unopened carcase.

For microscopical examination the smear of blood taken from the animal is fixed in absolute alcohol or heat and then stained with *Læffier's* methylene blue. The organisms take up the colour with great avidity. After about 2 to 4 minutes the stain is poured off and the smear washed well. Then it is dried and cleaned. The slide is then secured on the stage of the microscope by means of the spring clips. A drop of cedar wood oil is placed on the smear at a convenient place for examination. Then it is examined by oil immersion lens and adjusted. Then applying the eye to the ocular the mirror is arranged so as to obtain the maximum amount of light. Starting with coarse adjuster and then with the fine one the organisms are seen to be magnified, defined and easily differentiated. While examining, one will see in the field, rod shaped square cut organisms either as isolated

segments or in chains, stained blue with a faint pink margin which is known as the capsule or sheath.

This is characteristic of Anthrax bacilli. The multiplying bacilli in a culture show no tendency to separate but to hang together end to end in chain-like form. On close examination will be noted numerous fine transverse markings. These indicate the points of division between the individual bacillus on closer inspection.

Trypanosomiasis. In this case smears should be taken from the auricular vein during paroxysms of fever as they are frequently not present in the blood between the period of fever unless in very chronic cases. There are many protozoon stains of which *Romanowsky's* method and its many modifications are the best. The most convenient is the *Leishman's* method. For this method it is customary to draw a line on the smear portion of the slide mounted with blood with the grease pencil to prevent overflowing of the stain. It is not necessary to fix the film as the stain contains the fixative fluid, being an alcoholic solution. The stain is allowed to act for 30 seconds. Then double the volume of fresh distilled water is added to the stain on the film and agitated or mixed well with a glass rod or pipette. This diluted stain is allowed to act for 5 to 10 minutes. The stain is washed off with distilled water gently and afterwards kept for half a minute with the water to intensify the colour contrasts. Then it is dried and examined in the same way as for the previous one.

While viewing under microscope one will see among the blood cells which are generally stained red, elongated organisms spindle shaped or fishlike in form being stained blue. The Trypanosoma is a unicellular organism. The nuclei generally situated are about the middle of the body and the other at the posterior end. The body consists of a cytoplasm which by this method of staining appears blue. The cytoplasm is surrounded by periplast.

The undulating membrane which is variable depending upon the undulations of the organism is also noticeable. The border of this membrane may also be seen as a red line on the sides of the protozoon. There is also another red line which generally extends beyond one extremity of the organism and this is known as flagellum. This is the anterior prolongation which is in advance while in motion. There are so many varieties of trypanosomes infecting from the smallest of fish to the biggest of elephant with its individual morphological differences.

Piroplasmosis. In this disease the causal organism is generally found within the red corpuscle itself, intracorpuscular. Blood smear from the auricular vein is taken when the temperature is a little high but it is not uncommon to detect the protozoon at a time when the temperature is normal. Then the smear is fixed in alcohol and stained with the *Romanowsky's* method. The stain is allowed to act for about 15 to 20 minutes. Then it is washed and dried and examined. On examination one will find the red cells taking a pink colour and within those cells one can detect generally in pairs blue dots thicker at the outer extremity and thinner towards the middle (suggesting the pear-shape), where they appear to meet. But for detailed study of the organism there are modifications of the stain of which, *Giemsa's* is the best. By staining with this modification one can clearly see the different stains which the different parts of the organism take. The occurrence of the Piroplasms in the corpuscles is in pairs or fours which suggests their multiplication in binary fission. Besides these, there are other forms too as spherical and bacillary, but the pear shaped ones are most common. Yet with slight changes the morphology is almost similar. The nucleus of the piroplasm is generally found towards the margin stained either violet or faint red. The cytoplasm is stained with a bluish tinge. These organisms attack the corpuscle from within and destroy them. Rarely a stray piroplasm may also be detected out-

side the cell. There are various species in various animals requiring special study.

Hæmorrhagic Septicæmia :—In fact a survey of this disease does not come under the heading of this paper, being confined to only blood examination. Generally speaking one expects for the diagnosis of this disease a specimen of excudate obtained from the local swelling. But it is not rare, one finds the organism in the blood stream while alive, or in the vital internal organs after the death. Hence a smear of blood taken in this way may be a guide to study the organisms.

After fixing the smear in the usual way it is stained with Loeffler's methylene blue and allowed to act for about a couple of minutes. Then it is washed, dried and examined. In the field one will observe the cells stained blue and among them but outside there are minute pairs of dots of blue tinge with a fainter thin line connecting the pairs of dots. The outstanding morphological character of this bacillus is that it takes a deeper stain on the ends of poles and hence the name "Bipolar organisms." One can easily mistake them for diplococci; but on a closer examination of the various fields one has to bear in mind the fact that in diplococci the distance between the two cocci is far less as compared to the distance between the two poles.

There is a group of organisms of this type, pathogenic as well as non-pathogenic affecting various animals and birds. The general name is "Pasteurellosis". They are all closely related in their morphological and cultural characters. Their mode of infection, their morbid changes as Septicæmia in the blood in almost all the animals in which they affect aid one to group them up. But at the same time some of these organisms which are morphologically identical with each other are non-pathogenic.

Spirochaetosis :—Comparatively, this is a rare disease affecting the blood and hence a septicæmia, more commonly met with in aves. Smear from the fowl is

taken from any vein. At the commencement of the infection one may be able to detect more spirochaetes than at the later stage; and just before or after the death one may fail to detect the organism in the blood.

The smear is fixed in the usual way and stained by Loeffler's methylene blue and washed after a couple of minutes and dried.

On examination one will find more or less numerous thin thread-like spirally formed organisms just around or between the nucleated cells. The length and the number of spirals are variable ranging from 3 to 12 spirals, the length depending upon the number of spirals. A little change in the form may also be observed due to the position assumed by the parasite in the process of fixation. In such cases a spirochæte may even have a turn over itself presenting the figure of "8".

I have hitherto described the examination of blood specimens having an infection caused by pathogenic invasion from outside. There are certain other diseases as Anæmia in which progressive changes in the constituents of blood itself result in a modified form of wasting disease. In such diseases also the examination of blood is essential. But I have confined myself to the infective diseases.

[This article is by mistake printed here; it should have been printed under 'General Articles.']

TRANSLATION.

ASVAVAIDYAKAM.-EQUINE MEDICINE.

BY SRI MAHASAMANTA JAYADATTA.

(Translated from the original sanskrit with notes and commentaries, by Nripendra Nath Majumdar, Bengal Veterinary Service.)

(Continued from previous issue page, 123)

CHAPTER III

Sl. 21. A wide, large and protruding breast, but without prominent veins, and a straight forearm like an upright tree and a deep-set knee are praised.

Sl. 22. A horse's shank is said to be good (when it is) devoid of flesh and any curvature.

Sl. 22 & 23. A good fetlock-joint is well-rounded, even, neither rigid nor too prominent and free from any induration and ulcer.

Sl. 23 & 24. The hoof is said to be good when it resembles that of an ass, when it is round, well-jointed and with strong and compact frog.

Sl. 24. The sides (of the barrel) should be uniformly round with the upper portion somewhat fleshy.

Sl. 25. A round but not pendent belly, is very much praised. A good back should be level, but not too long, and slightly bent.

Sl. 26. A round and plump loins has been said to be praiseworthy. A tail with soft, fine and long hairs is adored.

Sl. 27. The scrotum should be round, slightly long and devoid of hairs. A short male organ without any black spot is desirable.

Sl. 28. The thighs should be fleshy, becoming gradually thin downwards. The parts from the shank to the hoof in the hind portion should be like those of the fore. Such had been told by the omniscient sages, Sālihotra etc.

AVARTA¹—WHORLS OF HAIRS.

Sl. 29. Now shall I describe the whorls according to Sāstras for knowing the good or bad (of horses) with certainty.

Sl. 30. Twenty are good and there are seventy-six more ². Whorls on the upper lip are auspicious ³.

Sl. 31. It had been said that horses with three or four whorls on the angles of the mouth fulfil all desires (of the owner).

Sl. 32 and 33. That (horse) with two whorls on the forehead ⁴ is the most auspicious and if there be three, arranged in regular succession from above downwards, it is known as Nisreni which accomplishes all desires of its owner.

Sl. 33 and 34. A horse having whorls on the part between the forelock and forehead known as Sruva brings in glory to its owner.

Sl. 34 and 35. The wise had said that a whorl on that portion of the neck called Nigāla, where bells are tied, is called Devamani and is very auspicious.

Sl. 35 and 36. Whorls on the root of the ear, arm, forelock or head are always adored, specially that on the head.

Sl. 36 and 37. A horse having four whorls on the breast and a very prominent one on the throat is very lucky and fulfils every desire (of its owner).

1. Āvarta—also called Bhramara, commonly known as Bhamri or Bhauri. This and the following few chapters might not be interesting reading to our readers, but the ancients laid great stress on these signs, so much so that in all the literature on the subject, a chapter is devoted to this. (The word "whorls" has been used to denote this.)

2. Altogether there are 96 varieties of whorls of which twenty are said to be of good significance and the rest are bad. Nakul (one of the five Pandavas and an authority on horses) in his Asvacikitsitam—Treatment of horses—says of 13 good varieties.

3. Sukracharya says—"Horses with whorls on the head, forehead, nose, throat and on the space between the eyes and ears are good and very much praised, while those with whorls on the breast, shoulders, neck, loins, navel, abdomen and sides are said to belong to the 'middle' class (i.e., fair). Sukranitisara, chap. IV, Sec. VII, Sl. 81 and 82.

4. Sukra says—"Three whorls on the forehead are lucky when situated high up and apart from each other but if closely situated, they are bad and when forming a triangle they are troublesome", (Ibid, Sl. 104 and 105.)

Sl. 37 and 38. (A horse having) whorls on the hind part of the barrel brings success to its owner, and if on the fore part it is very much praised.

Sl. 38 and 39. Whorls of the shape of a conchshell, wheel, Indian club (wrestler's), jeweller's drill, mother of pearl and lotus are said to be specially lucky if situate on the auspicious parts. ¹

Sl. 39 and 40. Now shall I state the whorls that are very much despised and bring in all sorts of trouble to its owner with the loss of life and property.

Sl. 40 & 41. Whorls on the part between the alæ nasi called Protha is said to bring in death to its owner.

Sl. 41 & 42. (A horse having) whorls on the upper portion of the nostrils brings trouble to its owner (while one) with whorls on the cheek ² causes death of its owner.

Sl. 42 and 43. Whorls on that part below the eyes known as Aśrupāta ³ are dreadful and cause extinction of the family of the owner.

Sl. 43. and 44. Two fingers' breadth from the outer canthus is the part known as Sankha (temple), a whorl on which, brings ruin and destruction to its owner.

Sl. 44 and 45 Whorls near the eyebrows also are not praised as they cause separation or death of friends and loss of money to the owner.

Sl. 45 and 46. Whorls on the poll and on the portion behind it known as manyā⁴ and on the neck are unlucky and those on the armpit will cause the death of its owner, in battle.

Sl. 46 and 47. Near the chin on its right and left are

1. Here ends the list of lucky whorls.

2. Nakula differs here and says that "A whorl on the right cheek is auspicious." Sukra upholds Nakula with the qualification that "Whorls on both the cheeks are lucky while one on the left brings on death to its owner." (Sukranitisara-Chap V. Sec. VII. Sl. 87, 88, 89)

3. Literally means-where tears fall.

4. Manyā—the ligamentous portion behind the poll; possibly the upper portion of the legamentum nuchæ.

the portions known as Hanu (lower jaw)—a whorl on which is terribly unlucky.

Sl. 47 and 48. Underneath the lower lip is the well-known part known as chin; it is a sin to possess a horse with whorls on that part or on the ears.

Sl. 48 and 49. The portion between the trachea and the Nigāla is called Gala;¹ it is sinful to have a horse with whorls on that part² or on the shoulder joint.

Sl. 49 and 50. A whorl on the part below the shanks called Kurca (back of the fetlock) causes death of the owner in battle.

Sl. 50 and 51. Eight fingers' breadth above the fetlock and on the sides are the parts called Kala (seat of splints), a whorl on which causes death of the owner by the shot of an arrow.

Sl. 51 and 52. A whorl on that distinctly pronounced part of a horse, resembling the hump of an ox, (i. e. the withers)³ indicates death of the owner.

Sl. 52 and 53. A whorl on that part near and in front of the withers called Vaha,⁴ causes death of the owner with his sons.

Sl. 53 and 54. The possessor (of a horse) with the dreadful whorl on the withers (Kakasa) is killed in battle and is devoured by carrion-eating animals.

Sl. 54 and 55. There is no doubt that whorls on that portion of the breast between the forearms, or on the seat (where the saddle rests), or on the chest or on the knee, are indicative of the death of the owner.

Sl. 55 and 56. As the sun destroys the dew so a horse with whorls on the sides destroys the owner with his clan.

Sl. 56, 57 and 58. Whorls on the part near the ergot

1. Gala—Nigāla is the portion of the neck where bells are tied and Gala is below it.
2. Sukra says—"If there be three whorls on the neck, he is the king of horses and is born only in the stables of kings". (Nitisara—Chap. IV. Sec VII Sl. 86.)

3. A horse with whorls on the withers is known as "Kākudi" and is seldom taken by Indian buyers.

4. Vaha—where the collar rests.

or below the fetlock, or on the shank, knee, navel, scrotum, croup and root of the tail are not praiseworthy.

Sl. 58 and 59. Whorls on the belly cause diseases of the stomach¹ and those on the anus or perinæum are not praiseworthy.

Sl. 59 and 60. Horses having whorls on the thigh or the hock are well-known as "Lingāvarta" and frustrates all purposes of the owner.

Sl. 60, 61 and 62. There are altogether eight sorts of whorls on a horse's body indicative of good or bad, viz, (1) Satapādi,² which is well-known, (2) Mukula, (3) Āvarta, (4) Sanghāta, (5) Pāduka, (6) Ardhapāduka, (7) Sukti and (8) Avalirha.

Sl. 62. Satapādi is that which resembles a centipede in appearance.

Sl. 63. That which resembles a Jāti³ bud is called Mukula. A round whorl is Āvarta⁴ and when the hairs grow in clusters, the whorl is known as Sanghāta⁵.

Sl. 64. When the hairs assume the form of a mother of pearl, the whorl is called Sukti⁶; and when the hairs appear like those of a calf when licked by its mother, it is called Avalirha.

Sl. 65 and 66. Pāduka is like a shoe; and Ardhapāduka⁷ is like the half of a shoe; an intelligent physician should classify these according to the particular forms that had been described by the wise according to the Sāstras.

1. It is not clear from the text whether this causes diseases of the animal itself or of the owner.

2. Sata is hundred and Pādi with legs; having hundred legs, i.e., a centipede.

3. Jāti is a small, fragrant and well-known flower of the Jasmine variety. The plant—Jasminum Grandiflorum—belongs to the Natural Order—Oleaceæ. It is also known as Chameli or Spanish Jasmine.

4. Āvarta a whirlpool, specially the centre. It is the general name for all sorts of whorls, but specially the round one.

5. Sanghāta, a collection.

6. Sukti literally means a mother of pearl.

7. Pāduka—a shoe; Ardha—half; Ardhapāduka is half of a shoe. It is not clear whether a horse shoe is meant.

Sl. 66 and 67. The sages having perfect knowledge of the signs of horses had classified the whorls in this (above) manner.

Sl. 67. Where there are two (whorls), one lucky and the other unlucky, none of them is productive of any result.

Sl. 68 and 69. But, even the dreadful Kākudi¹ horse can be purchased after offering gold² to a good Brahmin well-versed in the Vedas, whereby he is absolved of the crime and no blame attaches him.

Sl. 69 and 70. (A horse) with the beautiful whorl on the breast known as Srivṛkṣa,³ or Angad,⁴ or Musal,⁵ brings in jewels and kingdom to its owner.

Sl. 70, 71 and 72. Horses with the following ten whorls are greatly adored:—one on the upper lip called Māruta,⁶ one on the forehead called Hutāsana, two on the breast called the Aśvinideva, two on the head-Chandra and Sūryya, two on the abdomen-Skanda and Viśakha and two on the chest-Hara and Hari; but, if with even one less, they are unlucky.

1. Kākudi—a horse with a whorl on the withers.

2. An ingenious idea.

3. Pronunciation-Srībrikṣa, A long row of hairs (preferably white) on the breast.

4. Angad—an ornament like bracelet; of the shape of a bracelet.

5. Musal—a wrestler's club.

6. These names are of Hindu deities; Māruta—deity of the winds; Hutāsana—god of fire; Aśvinideva—two in number, the twin sons of Sūryya by his wife Sanjna transformed to a mare; the physicians to the gods; Skanda-kārtik, the son of Mahādeva; Viśakha—Ganesh, another son of Mahādeva; Candra-moon; Sūryya-sun; Hara—Mahadeva and Hari—Vishnu. These last two belong to the Hindu trinity.

(To be continued)

ASSOCIATION NEWS

Proceedings of the Annual Meeting of the All India Veterinary Association Madras Branch held in the S. P. C. A Hall on 25th December, 26.

Members present:

Messrs:

1. M. Anantanarayana Rao (in the chair)
2. T. Vinayaka Mudaliar
3. P. M. Thillanayagam Pillai
4. H. R. Rangaswamy Ayyangar
5. L. S. Parameswara Ayyar
6. T. R. Rajagopala Rao
7. R. Venkatrama Ayyar
8. K. S. Veerabahu
9. V. Janakirama Ayyar
10. S. N. Thammayya
11. P. Srinivasa Rao
12. P. Subramanian
13. G. R. Viswanathan
14. Noor Ahamad

1. The minutes of the last meeting were read and confirmed.

2. Read the annual report for 1925-26 and the statement of accounts for the year and the same was unanimously adopted. (Appendix I).

3. Resolved that this meeting records its deep sense of sorrow about the untimely demise of Mr. P. K. Atchuta Menon and the Secretary is empowered to send a letter of condolence to the members of the bereaved family.

Passed all members standing.

4. Resolved that the Secretary be empowered to send an appeal to those members that are heavily in arrears, requesting them to discharge their debt of honour by paying small amounts monthly towards clearing of the arrears. The Secretary will also write

to different members in different centres to try and use their influence to collect the arrears of subscription.

Proposed by Mr. M. Anantanarayana Rao.

Seconded by Mr. V. Janakiram Ayyar.

Carried unanimously.

5. Resolved that this meeting views with great concern the growing apathy on the part of some of the members towards the association and requests them to stand by the association as of old.

Proposed by Mr. T. Vinayaka Mudaliyar, with a speech printed at the end.

Seconded by Mr. M. Ananthanarayana Rao.

Carried unanimously.

6. Resolved that either Mr. L. Parameshwara Ayyar or Mr. S. N. Thammiah be sent to the A. I. V. Conference at Bombay during the ensuing Easter. The Secretary is also requested to be present there. These are to go as delegates from the Madras Branch.

Proposed by Mr. T. R. Rajagopal Rao.

Seconded by Mr. T. Vinayakam.

Carried unanimously.

7. Office Bearers' Election.

President : Mr. M. Anantanarayana Rao.

Secretary : Mr. M. S. Sastry.

Treasurer & Joint Secretary } Mr. V. Janakiram Ayyar.

Committee Members :

1. Mr. L. S. Parameshwara Ayyar.
2. „ P. Srinivasa Rao.
3. „ T. Vinayakam.
4. „ T. R. Rajagopala Rao.
5. „ R. Swaminathan.
6. „ Thillanayagam.
7. „ Noor Ahmad.
8. „ G. R. Vishwanathan.

Committee Members :

9. „ H. R. Rangaswami.
10. „ A. Ramalinga Mudaliar.
11. „ T. Raghavan.
12. „ P. A. Parthasarathi
13. „ V. P. Subbiah.
14. „ S. N. Thammiah.
15. „ S. Seshadri.
16. „ A. Castalino.

A vote of thanks was proposed and seconded for the retiring office bearers for the useful work they did during the year.

With a vote of thanks to the chair the meeting terminated.

“That this meeting views with great concern the growing apathy of some of the members towards the association and requests them to stand by the association as of old.”

In moving the above resolution Mr. T. Vinayaka Mudaliar spoke as follows:—

Mr. President and Gentlemen,

No body regrets the necessity of such a resolution more than myself. At a time when self-preservation is uppermost in the minds of individuals and nations, that an appeal of this sort should be on the record of a professional association is not much to its credit. So it is with no small amount of anguish, of indescribable agony that I have come forward with the above resolution, with a hope that finds solace in the fact that sons of India are never deaf to calls of righteousness, of justice, of equity and of fair-play. It is a heritage, gentlemen, that has come down to us from a hoary past, that does not pride in guilded ancestry, in palaces and princes, in bugle, bow and battle-axe, but in ill-clad, ill-fed, self-less Maharishis, whose path lay in righteousness, who feared no one under the sun and who were “the salt of the earth” to use the words of that Prince of Peace, Jesus, whose birthday the world is celebrating to-day.

Sons of such an ancestry! of such a noble heritage! Have you degenerated so far as not to hear the clarion voice of righteousness, the sublime and solemn voice of a cause that is so potent of good both to you and to the humanity at large? I believe not. I for one refuse to believe that we have fallen on such evil days. I have robust faith in the spirit of sacrifice, of good sense of my professional brothers. If to-day they seem to be apathetic, if to-day they are negligent, if to-day they are indifferent, I know the causes are economic than otherwise. The causes are of the lean purse and not of the heart.

They only need be told of the exact state of affairs and I feel sure their heart will go to their dear old association.

Brothers! let me pour out my heart fully on this question. I beseech you to bear with me for a little while as I take stock of our present condition which necessitates such a resolution.

The origin and development of our association are now a matter of history to our little Veterinary world. When that comes to be written by a grateful professional posterity, we know of the two names that will shine untarnished through ages. Little does the outside world know the exact extent of the services of those two noble souls. As one who had the privilege of watching them at close quarters, of studying them from behind the screen, I make bold to say that those services and sacrifices would have done credit to the greatest sons of any land, under any clime. This is no hero-worship but a narration of bare facts. Sleepless days and nights, of devices and means, with no better place to meet than station platforms, under the shelter of dilapidated railway carriages or cabins, in cold nights and chill weather, with the fright of transgressing the rules of Government service—never intentionally of course but by a lapse even—of injuring the feelings of their officers, surmounting difficulties incidental to all such organisations, adjusting, accommodating and yet not

yielding on principles, casting their domestic demands, cares and anxieties to the winds before this call of the profession, nurturing the association with a love too deep for words, were all features of their sacrifice, which must find utterance from abler men than my humble self. All those were terrible tasks indeed and when I look back over those days of 1920, the irresistible question presents itself to me "are those sacrifices to go in vain?" Have they suffered on our account for nothing? Will it meet the ends of Justice if we pay back our gratitude by perishing such an association within six short years of its existence?

Never mind of those founders even; let us be a little selfish. Will it be in our interest to allow this threatening decay to take hold of our association? No. A thousand nos. Gentlemen! It is easy to pull down a structure but what a task it is to build one! It is easy to destroy but well nigh impossible to create. Let that one elementary maxim be remembered by all of us in our attitude towards our association.

Till now I have briefly surveyed the difficulties encountered and sacrifices made for founding our association and now let me turn to the utilitarian side of our association. For kindly critics are not wanting to question us about our achievements for granting the lease of life we pray for our association.

Gentlemen, to begin with we asked for certain improvements in the college. Who can say that our requests had fallen on deaf ears? Thanks to our Principal, he has made it a first-class institution. We urged for the introduction of written examinations with favourable result. On the executive line we prayed for peons to T. V. A. S's; practically the prayer has been granted. We asked for change in our designation; we got it. The anomalous office of an Inspector has been abolished, though it is considered as highly unfortunate by some in the wake of subsequent developments. The clerical part of our work is now sought to be much reduced. We

asked for a Post Graduate course of studies. We got more than we bargained for. Our private practice rules have been removed as urged by us. The grade system has given place to the time-scale system. The scheme of converting the T. V. A. S's billets as so many minor dispensaries is now being slowly pushed on. All these may seem now trifling but they were bitterly complained of while they were in operation. Thanks to our departmental officers; without their silent aid and sympathy it would have been impossible to achieve anything. I don't claim all the credit entirely to our association, but I do say that, that body has done much in pressing forward our needs in a manner which no single individual could have done. It had the necessary dignity and authority to speak on behalf of the entire profession and it will continue to do so as long as you all don't waver in your duty of supporting her as of old. The association had contributed its own humble share to the sanction of Rs. 50, as allowance to the teaching staff of the Madras Veterinary College, by requesting Rao Sahib M. R. Ry. V. P. Subramaniya Mudaliar to plead on our behalf. We cannot be too grateful to him for all his invaluable services. The Veterinary Adviser deserves the heart felt thanks of the entire profession for his unstinted support of our cause.

Leaving alone our achievements in 'Service matters', let us see how far we have fared in other matters. We have been able to bring together annually members of our profession to one particular place providing facilities for their professional and social intercourse and thus increasing the *esprit-de-corps* amongst them in a marvellous manner. We are marching strong professionally—just think of the number of professional papers we have read and discussed. Do you think all these will go without benefitting our members? Again within these six years we were able to invite the All-India-Veterinary Conference to our Presidency and conduct it in a manner that received the approbation of all who attended that momentous

session. Your representatives had gone over the whole land and had established a bond of love between our Presidency and the far off Punjab, United Provinces, Bihar, Bengal and Bombay. Gentlemen, the zenith of our success had been reached when Madras was honoured by the rest of India with the work of editing an All-India Veterinary Journal and one of our members, mark ye, was installed in the editorial *ghadi*. That is our record. Don't you feel proud of that record? Is there anything to be ashamed of in our deeds? If there had been pitfalls, God knows, how far we have been trying to rectify them. No human institution is perfect. You may say "all these are true but not a pie has been added to our salary." Alas! it is too true to deny. You must remember we were very late in the field of organising ourselves. When that was done, retrenchment and economy were in the air. That was our ill-luck. I am sure the time is not far off when with the help of our sympathetic officers we will be able to move the Government to grant us our dues. Until then what is wanted is patience and self-confidence.

Brothers! I have spoken at some length on this resolution. The importance of the subject is my only excuse. The association stands to-day in dire need of all the attention you can pay her. Will you help her or will you stand aside and be an indifferent spectator of her troubles and turmoils? On your answer depends the prosperity or otherwise of your association. Your indifference will kill her. Your negligence will break her heart and if her voice is hushed into silence there will be none to champion your cause; with her will die your independence, your rights and claims and the advancement of science in this Presidency. God forbid such a calamity. Brothers! bestow your serious thought over this important matter and when my frantic appeal reaches my other professional brothers beyond the confines of this little hall, I beg of them to shake off their apathy and rise equal to the occasion. May God grant them strength enough to do this.

APPENDIX I.

Report of the managing committee of the Madras Branch of the All India Veterinary Association for the year ending, 31st October, 26.

Membership. The number of members on the role at the end of the year was 295. There was only one casualty during the year, Mr. P. K. Achuta Menon.

Meetings. Only one meeting was held during the year. As per resolution at the last annual meeting, the Easter session was discontinued and the Divisional Associations were requested to carry on the activities of the Branch Association by holding meetings during Easter and Michaelmas. The response of the divisions has unfortunately, not been satisfactory. Only one division, Coimbatore—held a meeting during the Easter, while the rest were not functioning. It has been the regret of the Secretary that his efforts to make them function were fruitless. The general annual meeting was held at Vizagapatam in December 1925 and the proceedings of this meeting as well as those of the Coimbatore Division were published in the organ of the Association, the Indian Veterinary Journal.

Delegation. The annual conference of the A. I. V. A. was held at Calcutta in December, 1925 and this Branch was represented there by 2 members—Mr. M. Anantanarayana Rao and Mr. R. Swaminathan. Besides taking part in the general discussion of the various subjects, Mr. M. Anantanarayana Rao gave microscopic demonstration of Piro-gibsoni and the latter—Mr. R. Swaminathan—read a paper on Pneumonia in dogs.

Indian Veterinary Journal. The Journal continues to be edited by our popular editor—Mr. P. Srinivasa Rao. It is gratifying to note that Madras still maintains its first rank in the number of subscribers; but it is to be regretted that

its share in the contribution of professional papers to the Journal has been very poor.

The reason for this is the existence of the G. O. preventing the members of the Civil Veterinary Department, Madras, from sending the articles to the Journal direct. The association has been requesting the Government to rescind the G. O. but so far without any success.

Finance. A statement of receipt and expenditure is herein appended. As usual, a monthly statement of account was being regularly sent to the members of the managing committee. It is a matter for serious concern that the arrears are still enormous.

General. During the year, the Association arranged for the submission of memorials to Government for the redress of grievances of its members in Government service. Rao Sahib M. R. Ry. V. P. Subramania Mudaliar, in spite of his failing health, interested himself whole heartedly in the matter, and on behalf of the Association, interviewed and addressed the Honourable Minister many a time. As a result of it, the Government has passed a G. O. published below recording his communication and sanctioning an allowance of Rs. 50 to the teaching staff of the Madras Veterinary College. The G. O. also stated that the other matters were under the consideration of the Government. For this, our grateful thanks are due to Rao Sahib M. R. Ry. V. P. Subramania Mudaliar for the selfless services rendered.

COPY OF THE G. O.

Veterinary :

Memorials—Assistant Surgeon Service Association ;
M. R. Ry. V. P. Subramania Mudaliar's—letter replied to.

Development Department.

G. O. No. R. 386

Dated 10th November, 1926.

Read the following papers :—

From the Veterinary Adviser, Endt. N. Dis. 72 A/26,
dated 3rd March 1926.

From the Veterinary Adviser, Endt. N. Dis. 80 A/26,
dated 4th March 1926.

From M. R. Ry. Rao Sahib V. P. Subramania Muda-
liar Avl, G. B. V. C. letter dated 15th August, 1926.

From the President, Veterinary Assistant Surgeon's
Service Association, dated 21st September, 1926.

From M. R. Ry. Rao Sahib V. P. Subramania Muda-
liar Avl., G. B. V. C. dated 3rd October 1926.

ORDER.

With reference to his memorial dated the 15th August 1926, M. R. Ry. Rao Sahib V. P. Subramania Mudaliar Avargal is informed that orders have already been issued sanctioning an allowance of Rs. 50 per mensem to the teaching staff at the Madras Veterinary College and that the other matters are under the consideration of Government.

2. The Veterinary Adviser is requested to communi-
cate the above orders to the President, Veterinary
Assistant Surgeons' Association.

(By Order of the Government, Ministry of
Development.)

For Secretary to Government.

To the Veterinary Adviser.

To M.R.Ry. Rao Sahib V. P. Subramnia Mudaliar
Avl., G. B. V. C.

Statement of account of the All India Veterinary
Association Madras Branch for the year 1925-1926. (to the
end of 31-10-26.)

No.	Details.	Amount. Rs. A. P.	No.	Details.	Amount. Rs. A. P.
	Closing balance of 1924-1925	351 3 1		Railway Charges for the delegates to Cal- cutta & back	
	Subscription 170 0 0			Secretary's trainage to Vizagapatam and back	111 7 0
	By interest on S. B. Acct. 7 7 0			Meeting expenses and the out of pocket expenses of the dele- gates to Calcutta & back including con- veyances.	62 12 9
				Postage ...	45 8 0
				Cost of printing	12 0 0
				Cost of stationery	1 9 6
				Presents to servants	1 8 0
Total receipts			Total expenditure		
for the year		177 7 0			234 13 3
Grand Total		528 10 1	Balance		293 12 10
			Grand Total		528 10 1

MADRAS. }
25-12-26. }

V. JANAKIRAMA AYYAR,

Joint Secretary and Treasurer.

EXTRACTS.

**Experimental Infection of the Jackal (*Canis Aureus*)
with *Piroplasma Canis*, Prana and
Galli-Valerio 1895.***

A PRELIMINARY NOTE.

BY M. ANANT NARAYAN RAU,

Senior Lecturer, Madras Veterinary Collge.

(From the King Institute of Preventive Medicine, Guindy.)

IN the early part of the year 1926, I had many opportunities of examining blood smears from the wild jackal, as also from the fox (*Vulpis bengalensis*), and on one occasion in the jackal I observed a parasite resembling *Piroplasma canis*.

It has previously been generally held that *P. canis* is not communicable to *Canidæ* other than the dog. Nuttall and Graham-Smith attempted to transmit this parasite by inoculation of virulent blood into an old fox and four young foxes, but they failed in their attempts. Lounsbury in South Africa failed to infect a jackal (*Canis misomilas*) either by inoculation or by the application of ticks. He conducted a second negative experiment in which he used a young jackal that had been under observation for 6 months previously. These workers employed the South African strain of *P. canis*. Nuttall and Graham-Smith say:—'The foregoing experiments appeared to indicate that *P. canis* is peculiarly specific in its pathogenicity, since it is incapable of producing disease in the fox and the jackal, species closely allied to the dog. They also seem to show that neither of these species is concerned in

* Reprinted from the Indian Journal of Medical Research Vol XIV No 1. July 1926.

the maintenance of this disease in nature.' (*Parasitology*, 1909, page 214.)

The following experiments were undertaken with the South Indian jackal:—

Four jackal cubs were purchased about the beginning of February 1926 and were under observation for over one month, and I also had in my care an experimental dog which was showing a few *P. canis* in its blood.

On 17th March, 1926, a jackal cub was given intravenously 5 c.c. of citrated blood from this dog and on 19th March, 1926, the cub received a second injection of 4 c.c. of the same blood. On 20th March, 1926, blood smears from the jackal cub showed a fairly large number of *P. canis*. Some red cells contained as many as 4 and even 8 parasites. On 21st March, 1926, the cub's blood showed a very few parasites and on the following day only one parasite was seen even after a prolonged search. From 23rd March, 1926, to 2nd April, 1926, no parasites were detected in its blood, but on 3rd April, 1926, they reappeared in fairly large numbers and were still visible daily a fortnight later. The temperature of this cub oscillated between 101° F. & 104° F. during the period in question. Its appetite was poor and it was losing condition.

On 5th April, 1926, 10 c.c. of citrated blood from this jackal cub was injected intravenously into another of the cubs which had been kept under observation. The blood of the second cub showed *P. canis* for the first time on 7th April, 1926. They were plentiful on 8th and 9th and could still be seen 10 days later.

CONCLUSION.

These two experiments seem to prove that the South Indian jackal is susceptible to *P. canis* when introduced into its blood. The finding of a parasite resembling *P. canis* in a blood smear from a wild jackal suggests that it may also be possible to transmit this disease to the jackal by the application of infected ticks, but experiments to this

end have not yet been undertaken. Also it suggests that the jackal is concerned in the maintenance of this parasite in addition to the so-called 'pariah' dog, which is usually blamed.

Note.--While studying blood smears from the wild fox, *Hæmogregarines* were observed in the polymorpho-mononuclear leucocytes. Three of these animals had been obtained from Cuddalore, a few miles south of Madras, and all of them showed these parasites in their blood. The morphology of the parasite appeared to be identical with that of *Hæmogregarina canis*, James 1905.

As far as I am aware this is the first time that the fox (*Vulpis bengalensis*) has been recorded as the host of this parasite.

I have to thank the Indian Research Fund Association who have made it possible for me to publish these observations, and my thanks are also due to Major H. H. King, I.M.S., Director, King Institute of Preventive Medicine, Guindy, for his help in the matter.

REFERENCES.

- (1) NUTTAL and GRAHAM-SMITH Note on attempts to infect the fox and the jackal with *P. canis*, 'Parasitology' 1909, page 211.
- (2) M. ANANT NARAYAN RAU *Hæmogregarina canis*. The Indian Veterinary Journal, Vol I, No. IV.

Nasal Granuloma in Cattle.*

BY V. KRISHNAMURTI AYYAR, I.V.S.,
Professor of Pathology and Bacteriology,
Madras Veterinary College.

THERE exists in the Madras Presidency a disease condition of common occurrence among cattle which is known as "Nasal Granuloma," or popularly, "Snoring Disease." From information gathered concerning the prevalence of the disease it would appear to cause considerable annoyance and often serious trouble to cattle owners. The condition appears to be highly infective, and as there is, so far as I know, no literature on its ætiology or any work connected with its occurrence, I made arrangements in February, 1922, to obtain material for study from animals suffering from this peculiar disease, and, after having made a preliminary investigation, I contributed a short article upon it to *The Madras Veterinary Journal* in July, 1922, at the special request of the Chief Superintendent, Civil Veterinary Department, Madras.

Though I have not been able to make a complete study of the disease for want of time, yet I believe it would be opportune to place on record certain observations made upon the disease and formations of a causal significance demonstrable in the lesions.

Distribution. The disease is found to have a wide distribution in the Madras Presidency, and cattle of all breeds and both sexes seem to be affected. It is also reported to be prevalent in certain other provinces in India (Assam and Bombay Presidency). At one time it was supposed that only draught cattle, the nostrils of

* Read before the Second Meeting of Imperial Veterinary Officers held at Calcutta in February, 1923, and slightly modified after discussion at the meeting by Mr. Edwards, Director, Imperial Institute of Veterinary Research, Muktesar. The specimens and slides from which photographs and drawings appended to this paper were made were exhibited by the author to the members at the meeting.

Reprinted from Memoirs of the department of Agriculture in India Aug. 1925. Vol. III No. 6.

which were punctated with nose strings, became affected, but the disease is seen also in heifers, cows and bulls which do not carry the nose strings, with which the Indian transport driver guides his cattle.

Lesions. The lesions are essentially chronic in development and are localised upon and limited to the nasal mucous membrane. In this location they are found as small rounded growths, each varying in size from that of a large millet seed to that of a big pea. The small growths develop in what seem to be multiple, densely packed formations, which in the aggregate suggest the appearance of masses of granulation tissue. Close examination indicates that the growths originate at or near the junction of the nasal mucous membrane and the skin, and on and around the margins of the perforation through which passes the nose string and thence spread to the surrounding mucosa. The mucous membrane becomes considerably thickened and considerable irritation is caused during respiration by the occlusion of the nasal passages. The friction would appear to assist in the spread upwards of the condition and sooner or later a large number of coarse growths develop over a large extent of the membrane. The masses formed by the aggregation of nodules may attain in some cases the size of a small walnut with their base intimately adhering to the nasal mucous membrane. As further enlargement of the masses takes place, necrotic foci begin to make their appearance on the surface of the lesions, and multiple abscesses of very minute size are found also to form in their interior. If a well-developed nodule is examined very closely the suppurative centres can readily be seen on the surface. The centres are seen as very small whitish or yellowish white elevations which on palpation seem to contain interiorly some soft material in the nature of pus. If a nodule is squeezed or punctured with a needle, a minute droplet of yellowish thick pus oozes out and a tiny cavity remains on the surface of the lesion. When the

lesions are left untouched there is a tendency for them to break down of their own accord and to be sneezed out by the animal, and a raw varied surface is then seen inside the nostril. It is probable that the spread of infection is caused by the infective material discharged in this manner from the nostril. In young nodules this appearance cannot be seen on their surface, but when they are incised one discovers a number of suppurating foci similar to those seen on the surface of the older nodules and containing pus of the same character and consistence.

If one attempts to dissect out these growths much hæmorrhage accompanies the operation. The dissected growths are greyish-red in colour, and very soft and fragile to the touch. How far into the nasal cavity the growths extend or what structural alteration the nasal fossæ have undergone in advanced cases, I cannot say, as I have not had the opportunity to trephine the nasal fossæ or to make a post-mortem examination of affected animals that have died, for deaths from the disease are very rare. Hitherto, in the few cases that I have examined clinically the upper limits of the affected membrane could be reached with the finger, and thus it would appear that the growths are limited to the anterior nares and are, for the most part, visible from the exterior. It has, however, been reported to me that cases occur in which the growths are found to extend far inwards into the interior of the nostrils.

Etiology. Of causal significance in the disease is a characteristic "ray-fungus" or "club" akin to the formation well known to occur in the common disease condition of Western countries designated *Actinomyces bovis*. The peculiar "granule" and "club" formation can be demonstrated quite easily in morbid tissues. Of 19 specimens examined, the granule formations have been detected in fourteen.

Histopathology. When sections of the lesion are examined histologically, they are found to be composed of

a newly formed typical connective tissue arranged in the form of numerous follicles. In the centre of most of these follicles, a large number of round cells are aggregated and held together in a fibrillary reticulated network and it is within this central core of tissue that the granules, presumed to represent colonies of the causal organism, are discoverable. Within other follicles one often finds a collection of poly-morphonuclear leucocytes invading and crowding the interior of the follicle in its entirety. The colonies would, therefore, appear to develop within tissue material consisting of fibroblasts which at first multiply owing to the irritation set up and form fibrous tissue distally from the centre of the reaction. As the disease develops the central core of fibroblasts breaks down, and invasion with Polymorphonuclear Leucocytes takes place with the resulting formation of a minute abscess cavity around the developing or involutionary mass of parasites. In some other foci of infection one can see only degenerated leucocytes and granular cellular detritus.

As the "colonies" increase in size, their composition can be readily resolved into radially disposed "clubs," and meanwhile some of the newly developed fibroblasts commence to become transformed into a fine interstitial connective tissue which subsequently becomes much fibrillated and finally transformed into fibrous tissue. In one of the specimens examined the "granule" formations were found to have penetrated more deeply, involving even the deeper layers of tissue forming the nasal septum.

Increased formation of fibrous tissue and endarteritis forms a predominant feature throughout any section of morbid tissue examined. It is worthy of note in this connection that Castellani and Chalmers, in describing the lesions of mycetoma in man, state that the fibrous tissue, by encapsulating the "fungus," prevents its spread, while the endarteritis cuts off the supply of nourishment

to it. In short, the histopathology of the nasal granuloma lesion is identically the same as that of the lesions found in all mycetomas.

Staining characters of the "colonies." Both the "clubs" and "granules" do not stain well with ordinary aniline dyes, but with Ziehl-Neelsen's method, as commonly employed in staining tubercle bacilli, one obtains excellent results. They are found to be "acid" and "alcohol-fast," and it may be affirmed that some of the colonies are as acid and alcohol-fast as tubercle bacilli. When stained by Ziehl-Neelsen's method, and counterstained with methylene blue, they stain an intense red colour, while the rest of the tissues are stained blue. With a view to obtaining more precise information in regard to the degree of the so-called "acid-fastness" possessed by the colonies, the methods adopted by Herman and by Much for staining acid-fast organisms were applied and the colonies were found to be acid-fast by these methods also. They were not stainable by the method of Gram.

Whatever methods are employed for staining the "granules" and "clubs" they can be seen clearly in the lesions as relatively coarse masses of various sizes and shapes. Many of the "granule" masses are readily seen to consist of radiating elements—the so-called "rays" or "club"—emanating from what seems to be a kind of basal membrane surrounding a central almost hollow core. Some of the rays are short and stumpy having the appearance of typical Indian clubs, while others are long, delicate, and fringe-like. There would seem to be within each ray a central filament by means of which it is attached to the membrane surrounding the central cavity. It is not improbable that the appearance of a central cavity is due to the shrinkage of the radiating elements during the fixation of the tissues for histological examination, or to the contraction or elimination of the thin purulent matter in which the granules are embedded. In some granules the central space is not a hollow cavity

but is found to be occupied with a granular detritus and pus cells with finely shredded filaments radiating from its centre.

Symptoms of the disease. The earliest sign of the disease that attracts the attention of an observer is the frequent sneezing of the animal which is more marked at work than at rest, accompanied by a thick mucous discharge from the nostrils. If one examines the nostrils at this stage, small eruptions as described already are seen. As the disease advances the nodules increase in number and a snoring noise becomes more noticeable and the animal sneezes repeatedly. The mucous discharge then becomes profuse and sanguineous at times. When the growths have commenced to disintegrate and to be discharged, the animal is greatly relieved of its difficulty in breathing and the snoring noise becomes less marked, but the relief is only temporary, for the growths recur and cause a repetition of the symptoms. Reports were forthcoming of animals becoming so debilitated by the disease that they succumbed to it.

Mode of infection. As in the cases of other actinomycotic infections, infection in this disease is presumed to take place through wounds, and in view of the very definite localization of the lesions it may be considered *a priori* that the probable portal of entry of the causal agent is therefore through some abrasion or wound in the nasal mucous membrane, which may be either caused by misuse of nose strings or wounds inflicted by coarse grass during grazing. When animals with such abrasions have access to food or water containing the causal agent, these wounds offer a good channel for its entry into the tissues and having once established itself there it excites a chronic or extremely subacute inflammation and undergoes itself a sort of involutionary metamorphosis accompanied by a tissue reaction resulting in the formation of granulation tissue, and the subsequent changes to which allusion has already been made. That the infection

of the mucosa or sub-mucosa takes place in close proximity to the skin is closely borne out which shows the "granular" formations very close to the papillæ of the skin.

In considering the possible sources of natural infection among cattle in the Madras Presidency, where the disease is widespread, it is not unreasonable to assume that either the straw on which the cattle depend for the bulk of their ration may harbour the causal agent in a saprophytic form and thus be a source of infection, or infected watering and feeding troughs may offer a good medium for the growth and development of the causal agent and form very likely a source of infection to cattle that have access to them. Of these alternatives, the latter seems to be the more probable one, inasmuch as numerous instances have been brought to my notice in which the disease was reported to have made its appearance in a herd only when the healthy cattle were allowed to drink and feed along with infected cattle. This explanation, however, requires experimental confirmation.

Prophylaxis. From what we know of the nature of other actinomycotic affections and of the very widespread prevalence of this disease, prevention would consist in advising people of the grave danger of allowing their healthy animals to have access to feeding and watering troughs which have been made available to infected animals, and, as far as possible, infected animals should be provided with feeding and drinking arrangements quite separate from those of the still healthy ones.

Discussion. Having in mind the nature of the strikingly characteristic lesions found upon the nasal mucous membrane of the affected cattle, one appreciates here immediately that one has to deal with a lesion of a comparable origin to that of the well-known condition commonly referred to as actinomycosis in cattle. Nasal granuloma differs, however, from the common bovine actinomycosis in the following striking respects, clinically

and pathogenetically: (1) Situation exclusively on the nasal mucous membrane and never in the tissues of the tongue or jaw; (2) the superficial formation of the characteristic small nodular growths without deep involvement of tissues.

The condition known as actinomycosis in cattle is now known to represent, in reality, more than one etiological entity, although a feature of all types of the affection is the eminently localized development of the lesion together with presence of the causal organisms in the form of the very well-known stellate granules, which may reach macroscopic dimensions, in the interior of the lesion and which represent involution forms assumed by small aggregations of the causal agents.

In the early days when this disease was first investigated (Bollinger 1877, Israel 1878, Ponfick 1880), the organisms cultivable from the lesions and taken to represent the causal agents of the disease were members of the genus *Actinomyces*, as now designated according to the most recent system of classification adopted by the Committee of the American Society of Bacteriologists. The organisms included within this genus vary in certain respects among themselves, but possess the common characteristic of forming branching radiating threads, with club-shaped elements as "involution" structures within the lesions set up by them. A striking departure had to be made from the view that the disease was caused by a member of this genus only when Lignieres and Spitz (1902) published their observations upon the common causation of actinomycosis in cattle in Argentina by an organism differing considerably, morphologically and culturally, from members of the genus *Actinomyces*. The organism incriminated by them is a small bacillus $0.4/\mu$ in thickness by 1.0 to 1.5/ μ in length, Gram-negative, non-motile, and designated by them as "Actino bacillus."

Subsequent researches, notably those of Griffith, Bosworth, and of Magnusson have indicated that bovine

actinomycosis in Europe is caused probably more frequently by the *Actinobacillus* than by *Actinomyces*.

The appearance of "clubs" and "granules" presented by the two etiologically different conditions represented by *Actinomycosis bovis* in lesions is identical. Also, the detailed study of the properties of the two organisms have resulted in their establishment by recent writers within the same bacteriological (or, rather, mycological) group, which would seem to contain organisms of greatly varying characteristics, namely, Family Actinomycetaceæ Buchanan (American Society of Bacteriologists) or Family Nocardiaceæ (Castellani and Chalmers). The American Society of Bacteriologists divide the family Actinomycetaceæ into four genera, in which are included *Actinobacillus* (containing the single species *Actinobacillus lignièresi* only) and *Actinomyces* (with *Actinomyces bovis* Harz as the type species and comprising 64 species in all). Castellani and Chalmers include both organisms in the genus *Nocardia* Toni and Trevisan, 1889, of their family: *Nocardia bovis* (Harz, 1877) belongs to Section 2, *Parasitica* Foulerton, 1910 (Subsection 2, *Majora*), and *Nocardia lignièresi* (Brumpt, 1910) to Subsection 3, *Brevis*, of the same section.

It is beyond the scope of this paper to discuss further the affinities of the parasites responsible for the well-known bovine affection *Actinomycosis bovis* which, curiously so far as I am aware, is unknown or, at least, has not been recorded in India. It would seem that the causal agent of "nasal granuloma" must be closely allied to those of actinomycosis, that is, to organisms classified as Actinomycetaceæ, *Nocardia*, or, under what is now generally regarded as merely a descriptive term when applied to such organisms, "Streptothrix." Further laboratory investigations are necessary to elucidate this point, but I regret that through want of time I have not been able to undertake them.

CONCLUSIONS.

1. There exists a widespread disease condition among cattle in the Madras Presidency and some other parts of India, characterized by the development of chronic granulomatous formations upon the nasal mucous membrane.

2. The disease appears to be of an infective origin.

3. Clinically, the disease is manifested by a snoring noise due to the obstruction of the nasal passages and this symptom is aggravated by any condition which causes increased respiration. The disease is seldom fatal.

4. Histologically, the lesion resembles closely that of *Actinomyces bovis*, and in the tissue follicles composed of connective tissue elements, one can readily demonstrate granules very similar in appearance and texture to the so-called "ray-fungus" of actinomyces.

I am very much indebted to Mr. Aitchison, Principal of the Madras Veterinary College, for the facilities he afforded me in carrying out this investigation, and I take the opportunity of conveying to him my grateful thanks for his sympathetic help.

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Foot and Mouth Disease and its Treatment with Sterilised Milk.

BY E. MEISSNER, D. V. M., KUTTERSCHITZ.

Prager Archiv. f. Aug. 15th, 1926, Tiermedizin.

(Extracts from The Veterinary Journal, December 1926.)

Since inoculation with serum in this complaint is very dear, and the stuff seldom handy, I resolved to try the milk treatment. I was induced to do this by reading an article by Wittmer in the "B. T. W.," which was produced in the "Archiv" for September 15th, 1924, and which proclaimed the great advantages of this new method.

When an outbreak of foot and mouth occurred at Meierhof I resolved to try the treatment and will state at once that the result was quite astonishing.

Not only cows, but oxen, bulls and calves were inoculated.

For the inoculations the necessary milk was freshly taken from several cows acutely affected with foot and mouth. It was put in clean sterile vessels then through boiled linen cloths and after cooling and in a lukewarm state subcutaneously injected on both sides of the neck of the animals. The amount given varied according to the size of the animal from 80 to 120 c.c.; calves, 20 to 40 ccm. After injection all the animals with the exception of the calves were infected with the saliva of sick animals.

With great difficulty we succeeded in getting eight litres of milk from the first eight cows that were ill, although the cows had missed a milking time—a proof of how the flow had declined. Statistics show that the loss of milk in this country in affected animals is 75 per cent. in old milking cows, 55 per cent in fresh milkers, and 43 per cent. on an average, and that at best the milk supply after an attack only amounts to three-quarters of the pre-sick quantity.

The result is shortly summarised thus:—

(1) The milk supply which, after the illness of the first cows, had declined by 40 litres, showed only a fall of 34 litres three days after inoculation and during the whole period of the illness. Kept up to normal apart from the usual slight variations due to feeding.

(2) There was no loss of flesh, the animals only being off feed for a day and then regaining good appetites.

(3) The claw lesions only needed treatment in such animals which had panaritium before the attack.

(4) Calves born and inoculated during the outbreak (not, however, infected with saliva) did not fall ill. In the uninoculated calves, however, there was a high mortality.

(5) The milk supply of half the cows went up after inoculation, a fourth remained the same, whilst 25 per cent showed a decline.

(This treatment will perhaps interest veterinarians practising in India and Africa.)

Curson, H. H., M. R. C. V. S.—Treatment of Nagana with Tartar Emetic in Zululand in 1921-1923.

From a Thesis for the D. V. M. of Hannover Veterinary School 1926.

(Extracts from the Veterinary Journal, December 1926)

The author, from his extensive and painstaking researches, arrives at the following conclusions from the treatment of Nagana—sick animals with intravenous injections of tartar emetic:—

1. The treatment was easy to carry out, cheap, and quite suitable for mass use.

2. The effect of tartar emetic on a great number of *T. congolense* strains was favourable.

3. The intravenous injections hinder the formation of local lesions and quickly attack the parasites occurring in the blood.

4. The treatment apart from isolated cases of shock is not detrimental to the general condition of the sick animals.

5. The blood stream and tract were almost immediately sterilised and remained in this state for at least a week. The animal treated, during this time, is ruled out as a source of infection.

6. Tartar Emetic caused animal to recover which were too weak to stand and sometimes effected complete cure.

7. The method of treatment makes it possible for the sick animals to survive the "Nagana period" and the winter with its bad pasturage; the settlers could also use their oxen during the illness.

8. Tartar Emetic diminished the losses in the herds of the Ntambanana settlement from 25 per cent. in the year 1921 to 5 per cent. in the year 1922. In trials conducted in the Nagana Research Laboratory in the year 1922, it was found that the preparation saved the lives of 84 per cent. of cattle affected with *T. congolense*.

9. The use of the emetic hinders the quick and wide spread of the disease since all treated animals become no longer sources of infection.

10. The trypanosomes appear not to become easily active against the remedy, but on the contrary they generally undergo a great diminution of virulence.

11. In the fight against Nagana, in addition to medical treatment, the care and tending of the sick animals plays a marked part in bringing about recovery.

REVIEW.

The Annual Administration Report of C. V. D. Madras for 1925-1926.

The annual administration report of the C. V. D. Madras for the year 1925-1926 has just been published. It is an interesting record of a year's work, involving some

changes in the policy of the department and we shall therefore examine it in detail.

The one thing that strikes us most on reading the report is that the Government had failed to a great extent in administering proper Veterinary aid to the agricultural masses. During the year under report, the mortality from contagious diseases has been very great; indeed, it is nearly twice of what it was in the previous year and is the highest for the last quinquennium. The deadly disease Rinderpest alone "has been responsible for a little over 50% of the total mortality." And yet what do we find? In the words of the Veterinary Adviser, "many outbreaks had to go unattended for want of available Veterinary Assistant Surgeons". It is a pitiful confession, but still, there it is. The livestock of the country is the wealth of the nation and when that is drained away by ravages of contagious diseases of a preventable nature, it is the primary duty of the Government to take all measures to stop the ravages immediately. Diseases like Rinderpest, Hæmorrhagic Septicæmia, Black quarter are easily combated by preventive inoculation, but, as the immunity conferred by such inoculations lasts only for a little time, a kind of concentrated and intensive campaign against the disease is the first and foremost thing to do. Any other spasmodic and leisurely method is highly wasteful and ineffective. It not only allows the diseases to drag on but does not impress the ryot with the efficacy of the prophylactic inoculation. For an intensive campaign, a strong staff is very necessary, but, unfortunately, shortage of staff has been the chief problem of the department. We understand, that, as at present constituted, the department is short of even leave reserves. This is the result of the short-sighted policy which the Government has been pursuing for the last few years in not absorbing all the graduates that pass out of the Madras Veterinary College. That is a policy to which we have been objecting all along but our objections

were never heeded. It is never too late to mend and we do hope the Government would at least make amends for its past policy and immediately start on an intensive campaign against Rinderpest and other contagious diseases by employing extra special staff for the purpose. This is a duty which, we would emphasize again, *the Government should not neglect any longer.*

One of the important features of the year is the change of policy with regard to the itinerating staff. In those days when first that staff was constituted, the existence of the department was unknown and people did not even know what to do when their animals took ill. A kind of propaganda work to educate the masses was therefore very essential and this, the touring staff have been doing very well indeed all along. It may now be safely said that the need for such a propaganda no longer exists and that the department must therefore settle down to do real professional work. The abolition of the touring staff is therefore a step in the right direction. But, unfortunately, that staff has not been judiciously employed. We understand that in the majority of cases these men have either been attached to the various institutions as a 2nd Assistant or instructed to "run a camp dispensary moving from place to place every ten days." This, we think, does not make the fullest use of the available staff. To begin with, an itinerating dispensary can never be a success. For one thing, no one would entrust the treatment of one's animal to the care of, as one officer put it, a wandering Jew: for another, the officer himself has neither the facility nor the equipment to undertake the treatment of serious or chronic cases, which, alone would injure a spirit of confidence in the minds of the ryot. And, therefore, to organise a camp dispensary is only waste of good money. What, in our opinion, would be a sound policy, is to post these men to places in the interior of the district, preferably to probable centres of future Hospitals and equip them with bare

necessities to run a sort of rural dispensary. Outbreaks of contagious diseases in and around that centre would be attended to by those men provided it does not involve the closing of the dispensary for more than 24 hrs. Any report requiring attendance of a longer duration must be sent on to the nearest reserve staff intended for contagious disease work. This method, while it would not involve any extraordinary expenditure to the Government, would ensure the maximum utility from the available minimum staff. We remember that the present Hon'ble Minister for Development while he was an ordinary member in the previous council had sent up proposals very similar to the above: and we also understand that those proposals were favourably viewed by the different circle officers to whom they were sent for opinion. Now that the Hon'ble Member is in charge of the portfolio, may we suggest to him to look into the matter and put his proposals into practice?

Lastly, during the year under report, the Chief Superintendent of the C. V. D. was appointed Veterinary Adviser with control over the college and department. This is a much needed and long over-due reform, putting an end to the unsatisfactory nature of the dual control of the department that was existing before. A central control is a strong incentive to progress and we confidently hope that the present Veterinary Adviser, with his vast ripe experience, would ably and successfully tackle the many problems affecting the profession.

COMMUNICATIONS.

From R. Krishnamurthi,
Secretary, The Madras Veterinary College
Medical Association, Madras.

To The Editor,
The Indian Veterinary Journal, Madras.

Sir. I shall be highly obliged to you if you will kindly publish the accompanying letter in your valuable journal.

Thanking you in advance,

Yours sincerely,

(Sd.) R. KRISHNAMURTHI.

The Madras Veterinary College Medical Association.

This year the association was started early enough on 11th August, 1926, with Mr. T. J. Hurley, M.R.C.V.S., I.V.S., the then acting Principal of the college, as the President and Mr. G. T. D'Silva G.B.V.C., as the Vice President of the association. The inaugural meeting was held on the 3rd Sep. 1926, with Mr. T. J. Hurley in the chair, when M R. Ry. V. Krishnamurthi Ayyar Avl., I. V. S., delivered a very interesting lecture on "Health and Disease". Subsequently three meetings were held and the subjects discussed were the following:—

1. Malayan Species.
2. Rabies in Dog.
3. Foot and Mouth Disease.

It is very pleasant to note that almost all the students attend the meetings regularly and take a very lively interest in the same. Many essays are still forthcoming and many more meetings will be held before the end of the current year.

(Sd.) R. KRISHNAMURTHI,
Secretary.

The Indian Veterinary Journal.

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in the Indian Empire.

EDITED BY

P. SRINIVASA ARO, G. M. V. C.,
Veterinary Surgeon, Madras.

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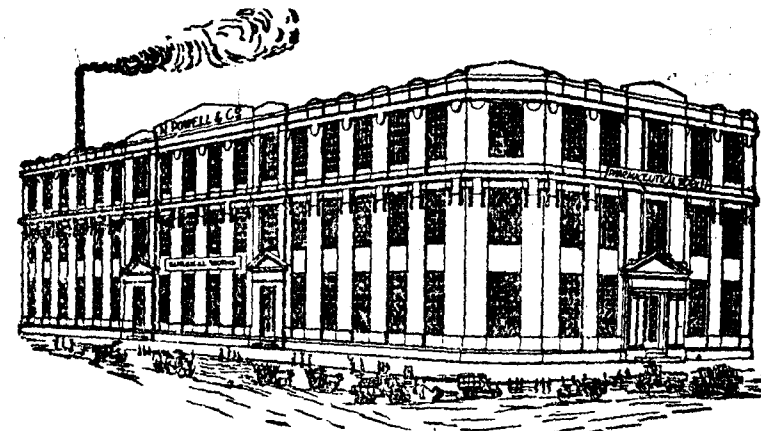
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" 1512	Searcher folding metal handle	...	" 3 8 0
" 1513	Drawing knife on wooden handle	...	" 2 0 0
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" 1583	Pocket-cases of Morocco leather with instruments from Rs. 37 to Rs. 65		
" 1593	Milking tube with two rings	...	" 1 0 0
" 1602	Tracheotomy Tube (Field's)	...	" 10 0 0
" 1604	Trocar and Cannula for Horse	...	" 6 8 0
" 1608	Thermometer clinical 6" in metal guard 1/2 min mag.	...	" 4 8 0
		1 min	" 4 0 0

Gum Elastic Catheter with stylett for Horse Rs 6-0-0 and for mare Rs. 5-8-0

N. Powell & Co.

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