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Journal

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VETERINARY
JOURNAL

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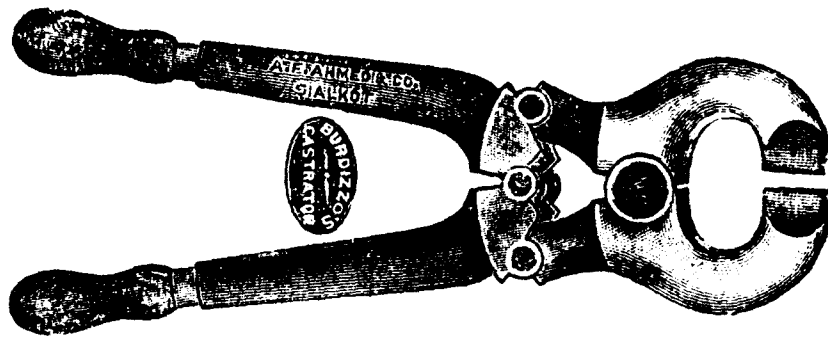
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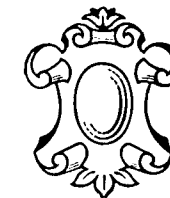
Vol. VII.

April, 1931

No 4.

The Indian Veterinary Journal.

(The Journal of The All-India Veterinary Association)



Editor :

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

Veterinary Surgeon, Madras.

Office : 26, WALLAJAH ROAD, MOUNT ROAD, MADRAS (S. INDIA)

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NOTICE

The Indian Veterinary Journal

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

PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION.

EDITOR:

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

*Veterinary Surgeon and Proprietor, Dr. Pangal's Veterinary Institute,
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THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)

Vol. VII.]

APRIL, 1931.

[No. 4.]

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THE

Indian Veterinary Journal

Vol. VII]

APRIL, 1931

[No. 4

Editorials.

THE ELEVENTH INTERNATIONAL VETERINARY CONGRESS AND INDIA.

We publish, in this issue of THE JOURNAL for the benefit of our readers, the important resolutions passed at the ELEVENTH INTERNATIONAL VETERINARY CONGRESS, held in August 1930 in London, under the distinguished presidency of Sir John McFadyean, M.B., B.Sc., C.M., LL.D., M.R.C.V.S.

There were in the august gathering some of the most celebrated members of veterinary profession from all countries. The resolutions passed by such a gathering of eminent men therefore naturally carry much value as they are the outcome of weighty discussion and ripe experience in the important field of veterinary science. They are of special interest to us in India, where the veterinary departments in different provinces and Indian States are yet to be properly organised to enable them to render the necessary service to the agriculturist and stock-owner. We, therefore, invite the attention of the Legislators and the Hon'ble Ministers in charge of the veterinary department to these important resolutions. We have no doubt that the heads of the veterinary department in various provinces in India, will press the several points contained in these resolutions, on the attention of their respective Governments and thus spare no pains to give practical effect to these suggestions at an early date.

Though foot and mouth disease does not claim any deaths among cattle in this country, yet the economical loss to the

agriculturist caused by the inability of the affected animals to do the normal work, is very great. Similarly, the milk supply which is already very inadequate and far from satisfaction is also affected to a great extent, when foot and mouth disease breaks out in any locality. Therefore, the recommendations made in the resolution on the subject is also of great practical value to this country.

It is no exaggeration if it is said that no systematic and scientific effort has been made till now to check the deaths from anthrax and its spread through hides, bones and other materials from the anthrax carcasses in this vast country. Now that the international experts have laid much emphasis on this subject, it should enable the Veterinary Directors of various provinces to get the necessary sanction for the prevention and control of this disease as indicated in the resolution.

The enormous loss caused by the great cattle plague—rinderpest—is very well known to all the cattle owners, legislators, the heads of veterinary departments, and the Hon'ble Ministers in this country, and most of the departments are concentrating all their attention on this all important question of suppression of this fell disease. It is therefore unnecessary to press this point any further. But it is appropriate to mention that the present inadequate staff of the veterinary department, the equally inadequate supply of serum and the numerous other causes have stood in the way of achieving any substantial progress in this respect. We shall repeat in this connection, that it is highly necessary at least for each of the major provinces and states to establish their own serum producing institutions to meet the incessant demands in their own areas.

We find, no attention, worth mentioning, has been paid to the investigation into the numerous diseases from which the cottage industry of 'Poultry Farming' has been suffering in this country. Both in the rural and urban areas, poultry breeding and egg production have been of very great economic value. Almost in every village and town numerous birds (fowls) have died of late, in this country from several diseases which require immediate attention. The instruction imparted at present on this subject in the various veterinary institutions in the country and want of necessary facilities

and time on the part of the over-worked staff in the departments do not enable the latter to carry out any systematic investigation into these causes. It is therefore time that the departments paid sufficient attention to this important subject and create the staff to conduct the necessary investigation in this vast field, and save the country from the great loss. 7 OCT 193

What all has been said above in connection with the diseases of poultry in this country, applies with equal if not greater force to the diseases of sheep and goat. The great economic part played by these animals in this agricultural country needs no mention in these columns, as it is well known even to the casual observer. No systematic effort is at present made to record, report and eradicate the numerous diseases which have been playing much havoc among these animals. The touring staff which is very much short of the actual requirements of the country has been always busy with the numerous reports of rinderpest as the area in charge of each member is very vast at present. The Directors of veterinary departments, without losing any much further time should make special representation to their respective Government with a view to get the necessary sanction and funds for conducting the much needed investigation into these and other matters.

In conclusion, we suggest the appointment of a special committee consisting of veterinary officers and representatives of agriculturists to enquire in detail into the present condition of the veterinary aid in this country, its immediate requirements including the subject of veterinary education and to recommend the necessary improvements, since it is no good to deal with these matters in piecemeal as at present. Therefore a comprehensive enquiry is an urgent necessity in the interests of rural economy and it is hoped that the authorities concerned will take the initiative in this matter without any more loss of time.

"THE CINDERELLA OF THE SERVICES".

It was an apt description of the Madras Veterinary Services when, during the last Budget session, one Hon'ble member called it the "Cinderella of the Services". We say it was an apt description because it is a fact, it is true; and pity it is, it is true; and, pitier still, that it is true practically all over India. Year after year, the representatives of the people in the Madras Legislative Council have been drawing the attention of the Government to the extreme inadequacy and insufficiency of veterinary aid to the agricultural masses of the country, to the alarming increase in the mortality of cattle from purely preventable diseases and to the unreasonable dependence of this province on a far-off laboratory for its requirements of protective serum. These representations have been in vain and the response of the Government to these pleadings have been very poor, indeed. Ministers after Ministers, and Parties after Parties have come into power and gone; but the Civil Veterinary Services have remained where they were. To make ourselves clear, we will deal with the services in Madras under three heads viz. Executive, Educational and Research.

On the executive side, the brunt of the whole work of the Department is on the subordinate service. Whether it be for carrying on a vigorous campaign against a ravaging contagious disease or whether it be running a Veterinary institution efficiently and cleverly, it is the veterinary Assistant Surgeon who has to do the work. And yet what is his position and status? His pay is poor and his prospects are gloomy. He does not get even a living wage and, from start to finish, his life is one struggle for existence. His many attempts to improve his condition have been fruitless. He has, for over a decade, been petitioning the Government, individually and through his recognised Associations, for a treatment equal to members of other similar services of the Government; but the Government have never been pleased to consider their prayers. His jurisdiction is still heavy and he suffers frequently for want of a relief. He cannot even get leave when required because, forsooth, there is work on hand and the Department has no leave reserves! Naturally, the whole rank and file is discontented beyond measure and we are not quite sure whether this dis-

content has had no adverse effect on the output of the Department. The strength of the flock lies in the sheep, and, if the latter is kept underfed and overworked, there cannot be much strength in the flock. This is such a simple true fact which, unfortunately, the Government have not yet realised. Why?

On the educational side, the course of studies in the Madras Veterinary College is far from satisfactory. As clearly explained in one of the previous issues of this Journal, the revision of the curriculum has been neither judicious nor productive of good to the students. In an already over-cramped course of 3 years, more important and vital subjects have been added without a corresponding lengthening of the course. What is worse, the selection of the staff has been open to very grave objections. Persons who have been toiling in the College as teachers for years, with credit to themselves and to their *Alma mater*, and persons who have been "specialising" in particular branches of Veterinary Science have been refused preferments on the sole ground of their want of Post Graduate study in a foreign country. These men were neither given study leave, when asked, to enable them to qualify for these posts, nor, as a special case, their specialisation taken into consideration. And, yet, these very men were asked to do the duties of lecturers drawing the pay of assistant lecturers! Could there be anything more unjust and unfair? If considered absolutely essential, why should not three or four men, experienced in the conditions of this country, be deputed to foreign countries for higher training, as is done in other departments even in these days of financial stringency? Why, we ask again?

On the research side, what has the Government done all these years? Have they allotted any some of money for conducting research into any of the varied diseases of the live-stock of this province? Have they at least, successfully tackled the question of the supply of protective serum to this province? The opening of a Serum Institute for this province has been under the "consideration" of the Government for the past so many years that it is not yet known when the "consideration" will materialize. From a preliminary "consideration" of the question to a comparative study of the working

of a neighbouring State Institute, it reached the realm of a selection of a site and its acquisition. A nervous feeling of a probable displeasure to the Imperial Government by this regular customer becoming independent soon brought a lull to the whole consideration of the subject from which it is only recently showing signs of some animated life—all the while, the cattle of this province die for want of a timely adequate supply of serum. The simple fact that this Serum Institute, when once opened, can ultimately be made the nucleus for a Research Laboratory, necessary for investigation of the various diseases of the live-stock of the province, is not recognised and Government still continue considering the question. When, in this connection, we consider the amounts of money allotted for research in the closely allied Agricultural Department, the omission to encourage the equally important Veterinary Research becomes quite glaring. Why is this difference?

Are we to understand that the live-stock industry is of no importance to the economic prosperity of the country? Are we to take it that the cattle wealth of the nation is of no consideration to the Government? In a country like ours, where small holdings are the general feature, mechanised agriculture is not a possibility and the ryot must necessarily depend upon his cattle for the cultivation of his land. It is, therefore, the bounden duty of the Government to provide adequate Veterinary aid for the live-stock of the country and we do hope that the Government would hereafter at least throw off their apathy and indifference and rouse themselves to action.

Appeal.

AN APPEAL TO THE VETERINARY PROFESSION IN INDIA.

I am thankful to the members who had assembled in large numbers in the Seventh All-India Veterinary Conference at Bangalore in December last, for having unanimously elected me as the General Secretary of the All-India Veterinary Association. I consider this is a sacred call to me from the profession to place at its disposal my humble services and experience gained in the course of working of the Madras Branch

of the All-India Veterinary Association for over 10 years and I have therefore gladly, though, with good deal of diffidence accepted the honour.

The last Conference at Bangalore under the distinguished presidency of Col. A. Olver was a remarkable success over the previous sessions in more than one respect. An account of this has already appeared in the press from more than one pen. Therefore I need not elaborately describe it here. However, I should not hide the unpleasant fact that a few of the provinces did not represent at the Conference. It is true there are many unavoidable circumstances which stand in the way of members to undertake such long journeys. But still, it should have been possible to find some member or members in each province who could make some sacrifice for a noble cause as ours. It is hoped that such defects will soon be a feature of the past and will not be allowed to recur.

Communications have been addressed to the Secretaries of the Provincial Branches, requesting for information as to their head-quarters, number of members, office bearers and to elect two representatives to the Executive Committee of the All-India Veterinary Association. Many of the provinces have not yet responded even though it is over three months, since the issue of this communication. I make bold to repeat that request now through the columns of the *Indian Veterinary Journal*, with a hope it will have a ready response.

Again I make use of this Journal to appeal to the members of the profession in such of the provinces which have not yet organised and affiliated Associations to remove this defect at an early date by starting and affiliating them to the All-India Veterinary Association without loss of any more time. These are days when only well organised and developed Associations alone, will be able to achieve some success for the entire profession. Therefore I need not emphasise any further on the necessity of having a good strong working branch Association in each province in India and an equally strong and representative Central Association for the whole country.

It is expected that the British Veterinary Graduates who have been at the helm of affairs in each province and to whom the Indian Veterinary profession eagerly looks for light and lead, will encourage the formation and working of

the Association in their respective areas on the model of the National Veterinary Medical Association of Great Britain and Ireland, of which almost all of them are members. These British Officers have spread Veterinary Education in this country and organised the official departments, and the Indian Veterinary profession is really grateful to them for their services. Now it is hoped they would go a step further and encourage the promotion of the Association of these professional men in each province as mentioned above.

The Central Committee is in need of funds to carry on its work and it requests each province to give its quota of contribution for that purpose.

The following information from each province is urgently required and it is hoped it will be furnished to the General Secretary without further delay to enable him to do his work at once:—

1. The head-quarters of the provincial association.
2. Its office bearers' names and addresses.
3. Number of members on its rolls and total number of members in their province.
4. Rate of subscription collected.
5. Statement of account of Receipts and Expenditure.
6. Copy of rules.
7. Programme of work.
8. The correct designation of the Government departmental head who controls the Veterinary department.

Information on any other useful matter.

The next session of the All-India Veterinary Conference has been invited to Patna, and if all the provinces get ready from now to make this a great success, the work of the Reception Committee will be made easy. It is expected Bihar & Orissa will soon form the Reception Committee and issue a necessary draft programme for the information of the provinces and invite the contribution of professional papers which need to be edited and sent out to the delegates, much in advance of the Conference to enable them to come prepared for discussion. There is enough time now to move in this direction.

I close this appeal with a prayer to the Almighty God to lead us aright, so that the organised Veterinary profession in India may place its valuable service at His feet for the benefit of the country.

ANANTAPUR, }
1-4-1931. }

(Sd.) M. S. SASTRY,
General Secretary.

Notes.

We are glad to note that the Hon'ble Members of the Madras Legislative Council have been evincing increasing interest in the work of the Civil Veterinary Department in the presidency. This is evident from the number of members who took part in the budget discussions when the demand on Veterinary Head was moved by the Hon'ble Minister. Extracts from these speeches appear elsewhere in this issue.

This is a healthy indication of the fact that the existing staff of the veterinary department have been popular in rendering valuable help to the agriculturist even under the adverse circumstances such as, inadequate staff, large jurisdiction, short supply of serum, illiteracy and ignorance of cattle owners.

Member after member has pointed out the immediate necessity for establishing a Veterinary Serum Institute for the manufacture of Rinderpest Serum and other preventive sera and vaccines, in this presidency. The Government has admitted both the necessity and urgency. Experiments in the production of rinderpest serum in Madras have proved successful. Yet, the scheme has been inordinately delayed. What causes this delay is a mystery to the public. It is however hoped, that the starting of a Serum Institute in Madras will be a *fiat accompli* ere long.

One Hon'ble member (Mr. A. B. Shetty) referred *interalia* to the question of improving the course of Veterinary Edu-

cation in the Madras Veterinary College and affiliating it to the University of Madras. We are sorry, no other member has referred to these important subjects in the discussion. The reply from the Hon'ble the Development Minister as reported in the press does not also refer to this question. We are never tired of repeating the fact that unless the highest Veterinary Education is made available to the youths in this country, and unless a status is given to this science by instituting a Veterinary Faculty in the local university, the veterinary profession will not be able to take its place among the learned professions and the result will be its inability to advance and serve the interests of the community to the extent to which it has been able to do in the advanced countries of the west.

The University of Madras has of late years, made rapid progress in the matter of instituting courses of studies in subjects other than those of the old classical type. The institution of courses of studies in agriculture, public health, commerce, economics and music are some of the instances. We find, of late, attempts are being made to institute a faculty in military science. These are all no doubt, good signs of progress. Since veterinary science is economically of vital importance to the great rural population, it is hoped, that the present enlightened Ministry whose members hail from those classes, will take early steps to create a Veterinary Faculty in the University of Madras and thus lead other provinces. This is also a subject which deserves the immediate attention of the Senators of the University.

On a previous occasion, we expressed the hope that the present Director would take up this subject as he had the advantage of visiting recently, the University Veterinary Colleges on the Continent of Europe, where under the patronage of both the State and the Universities the veterinary science has made rapid progress in all directions, to the great benefit of the public. We do not know if Mr. Saunders has moved in this direction. However we repeat this hope.

Recently in all the conferences of the agriculturists, Yadhavas and others interested in cattle great anxiety was express-

ed on account of the enormous loss of cattle from rinderpest in the Southern Presidency. During these conferences and while presenting addresses to the Hon'ble the Development Minister, request was made among others, for the early provision of a veterinary institution and a touring veterinary assistant surgeon for each taluk. The Minister sympathised with the royts and promised to do his best. He is also reported to have said that for want of trained hands greater number of people could not be entertained in the Civil Veterinary Department. Most of his predecessors in this high office, have said the same in the past. This year, the Madras Veterinary College has produced 26 new graduates in the recent examination. This is an opportunity for the Hon'ble Minister to translate his sympathy into solid action, drafting all these 26 young graduates into the Service of the State and thus giving some amount of relief to cattle owners.

Usually in the past, there used to be unnecessary delay of 8 or 9 months before the passed candidates were entertained in the department. In the interval some of them used to seek service outside the presidency, while there was great need for their services at home. It is hoped that the present head of the department will not allow such delay to recur.

Recently there was an advertisement in the Madras dailies inviting application to fill up 10 appointments of veterinary compounders, in Madras Civil Veterinary Department, from duly qualified men. We are not certain if there was a response from sufficient number of men, because we are not aware of any arrangement made to train up veterinary compounders in the south. We only hope that these posts will not be kept vacant, repeating the usual statement, that no trained people are available. It is always better to see ahead and provide for the future. If this advice is followed, the institution of courses for veterinary compounders in the Madras Veterinary College may be re-established.

Following the recent announcement in the last issue of this Journal regarding the availability of lantern slides in the Madras Veterinary College, there seem to have come a number

of demands from different parts of Madras Presidency for the supply of these slides for the purpose of propaganda. It is learnt that many of the staff who indented for a loan of these slides were disappointed owing to the availability of only one set in each variety. We said in the last issue that many sets of these slides should be made available to serve the requirements of this vast presidency. We hope that the authorities concerned will see to this before the enthusiasm of the staff cools down.

We find that in the current year's budget, provision has been made for the creation of a post of 'Special Rinderpest Officer.' This is a move in the right direction and long overdue. If the Officer selected for the post spends much of his time in camp in the affected rural parts, he will be able to get the first hand information and fresh materials for his investigations, since there is greater scope for this kind of work in the villages than in the towns and cities.

This Journal is the Official Organ of the All-India Veterinary Association, but owing to the paucity of news of veterinary interest from other parts of India, it suffers a good deal. Often times, the members especially the Secretaries of the Provincial Associations, have been requested to keep the Editor informed of various items of veterinary news in their respective provinces. Since the response is poor, we repeat this request once again.

Enquiries have been reaching us from different provinces asking for information whether the Provincial Branch of Bihar & Orissa which has the honour of inviting the next All-India Veterinary Conference to its midst in Patna, has formed a Reception Committee as yet or not. The enquirers also suggest for the early arrangement and announcement of the programme, so that they may not be rushed through at the eleventh hour, as on the previous occasion. We fully endorse the views contained in these enquiries, and hope that the programme will be available for publication in the next issue of the Journal, if not earlier than that, through the daily press.

We invite the attention of our readers to an appeal from the General Secretary of the All-India Veterinary Association published in this issue and we express our hope that there will be ready response from the profession in this country.

Our constituents may be reminded that with this issue the Seventh Volume of the Journal will be completed and the next issue will be the first number of the Eighth Volume. The Post Office does not now keep the V.P., articles for more than three days without charging extra fees of annas two for each day of detention. Therefore with a view to avoid unnecessary payment of charges on both sides, it is requested that the subscribers will kindly remit the amount of subscription by M.O., in advance, failing which the journal will be sent by V. P. P., as usual for their ready acceptance.

We are glad to inform our readers that Professor A. C. Aggarwala, B. Sc., Hons., M. R. C. V. S., of the Punjab Veterinary College, Lahore, was awarded a medal for writing a memoir on "The Art of Milking" by AL'Academie Veterinaire de France (The French Veterinary Academy). This is the first distinction of its kind that has been conferred upon an Indian Veterinary Surgeon. We hope that many more will follow.

Original Articles.

A SCHEME FOR THE SYSTEMATIC DESCRIPTION OF DISEASES OF ANIMALS.

BY

D. C. MATHESON, F.R.C.V.S., D.V.S.M. (Vic.)

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Royal (Dick.) Veterinary College,
Edinburgh.*

In an article contributed to "The Veterinary Record" in 1929, the present writer (Matheson 1.) enunciated what he called the seven fundamental questions in Epizootiology and pointed out that these questions suggest a proper line of thought for the student and that the initiation of proper methods of control depends upon correct answers to them. The questions may be applied to any disease but they are especially applicable to the contagious and/or infectious diseases.

For the convenience of reference the questions may be summarised:—

1. What is this disease?
2. Why is the disease so important?
3. How may the disease be recognised?
4. What can be done to prevent the disease gaining an entrance into the flock, herd or drove etc.?
5. What can be done to limit the spread of the disease when it does gain an entrance to a flock, herd or drove etc.?
6. What can be done to eliminate the disease from a flock, herd or drove etc.?
7. What can be done to eliminate the disease from the flocks, herds or droves etc., of the country?

These questions were originally devised and used by the writer in connection with an address on "The Control of Bacillary White Diarrhoea of Chickens" which he delivered at a Poultry Conference organised by the Department of Agriculture for Scotland in May 1928; the article already referred to was based upon the address, that is the reason why

the word "so" appears in the second question: for general purposes it may be omitted and the question may read "Why is the disease important?"

The words "pack" and "stud" may be added after the word "drove" in questions four, five, six and seven: the word "or" will then appear between the words pack and stud. The object of the present article is to show how these questions may be adapted to the purposes of a scheme for the systematic description of diseases of animals. The student will find, if he arranges his lecture-notes, supplemented by information available in text books, current periodicals etc., under the headings indicated below, he will have when finished an orderly presentation of the known facts, etc., in connection with any disease, while there is kept before his mind the important consideration—"What can be done to prevent it"? That is what the stock owner wants to know: other aspects of a disease have an academic interest—a legitimate interest—for the practitioner and the research worker: but in the end "What can be done"? is the really important consideration. In an article on "Avian Coccidiosis" the writer (Matheson 2) has used this method as a basis for his remarks because it confronts the practical questions of the stock owner with the answers which Science has to give.

The scheme presently to be formulated is relatively complete; the young practitioner who wishes to prepare an article for presentation at a meeting of his Veterinary Medical Association will find a useful guide for the arrangement of his facts and observations: the scheme can be expanded to cover the requirements of a monograph, or it can be condensed to meet the needs of an article where, as in the case of "Avian Coccidiosis" referred to above the number of words permitted was strictly limited. The scheme may now be formulated.

1. *What is this disease?*
Definition.
2. *Why is the disease important?*
History.
Popular names.
Geographical distribution.
Tenacity of life of the virus.
Facilities for distribution of virus.

- Methods of transmission.
- Disposing causes of the disease.
- Animals susceptible.
- Pathogenicity of virus.
- Pathogenesis.
- Mortality rates.
- Disposes to secondary infection?
- Cause of economic loss?
- Etc.,
- 3. *How may the disease be recognised?*
 - Seasonal incidence.
 - Anamnesis.
 - Incubation period.
 - Symptoms.
 - Course of the disease.*
 - Characters of virus.
 - Clinical tests.
 - Material to be sent to the laboratory for examination.
 - Laboratory tests.
 - Post-mortem examination.
 - Data upon which diagnosis is based.
 - Differential diagnosis.
 - Prognosis.
 - Etc.
- 4. *What can be done to prevent the disease gaining an entrance into the flock, herd, drove, pack, or stud etc.*
 - Character of virus.
 - Obligatory parasite?
 - Facultative parasite?
 - Unknown cause.
 - Prohibition of importation of animals from countries, where the disease exists.
 - Quarantine measures.
 - Relation of incubation period to duration of quarantine.
 - Application of biological or other tests to any animal before admission to flock, etc.
 - Measures to prevent owner, or attendant introducing the disease by carrying virus on boots,

- clothing etc., from a centre where disease exists eg. shows, markets, fairs etc.
- General hygienic and sanitary measures.
- Dietetics, Prophylactic immunization, etc.
- 5. *What can be done to limit the spread of the disease when it does gain an entrance to a flock, herd, drove, pack, or stud etc.*
 - Prohibition of movement.
 - Stamping out measures.
 - Isolation of affected animals.
 - Isolation of incontacts.
 - Treatment.
 - Immunization.
 - Sanitary and hygienic measures. Dietetics.
 - Disposal of carcasses, etc.
- 6. *What can be done to eliminate the disease from a flock, herd, drove, pack, or stud etc.*
 - Persistence in the measures required to limit the spread of the disease.
 - Systematic testing to discover carriers.
 - Removal of carriers.
 - Immunization.
 - Attention to hygiene.
 - Sanitation and dietetics.
 - General management.
 - Etc.
- 7. *What can be done to eliminate the disease from the flocks, herds, droves, packs or studs, etc., of the country?*
 - Education of stockowners as to measures of prevention.
 - Immunization.
 - Administrative measures.
 - Etc.

It is obvious that the subdivisions under the questions do not apply equally to every disease: for some, eg. Rinderpest they are generally applicable: for others, eg. Equine Hæmoglobinuria their application is more limited as this disease does not call for administrative measures or immunization etc. The sub-divisions are intended to be suggestive to thought: they must be modified as may be required for each disease considered.

For the guidance of those to whom they may be useful a list of books is appended: the titles explain their purpose: a perusal is recommended.

Matheson D.C. (1929) The Control of Bacillary White Diarrhoea of Chickens. The Veterinary Record. Vol. 9 P. 490.

Matheson, D.C. (1930) Avian Coccidiosis. Proceeding Fourth World's Poultry Congress, London.

Allbut T. Clifford (1905) Notes on the composition of scientific papers. Macmillan & Co., London.

Rolleston H.D. (1911) On writing theses for M.B. and M.D. degrees. John Bale, Sons and Danielson Ltd., London.

Earle S.C. (1911) The theory and practice of technical writing. The Macmillan Co., New York.

Privy Council Medical Research Council. Notes upon the preparation of reports for publication. London, 1929.

Fisher R.A. (1930) Statistical Methods for Research Workers. Oliver and Boyd. London and Edinburgh.

Jevons W. Stanley (1913) The Principles of Science. Macmillan & Co., London.

A STUDY ON MADRAS FOWL PEST*

BY

K. KYLASAMAHER, G. B. V. C.

(From the Madras Veterinary College Laboratory).

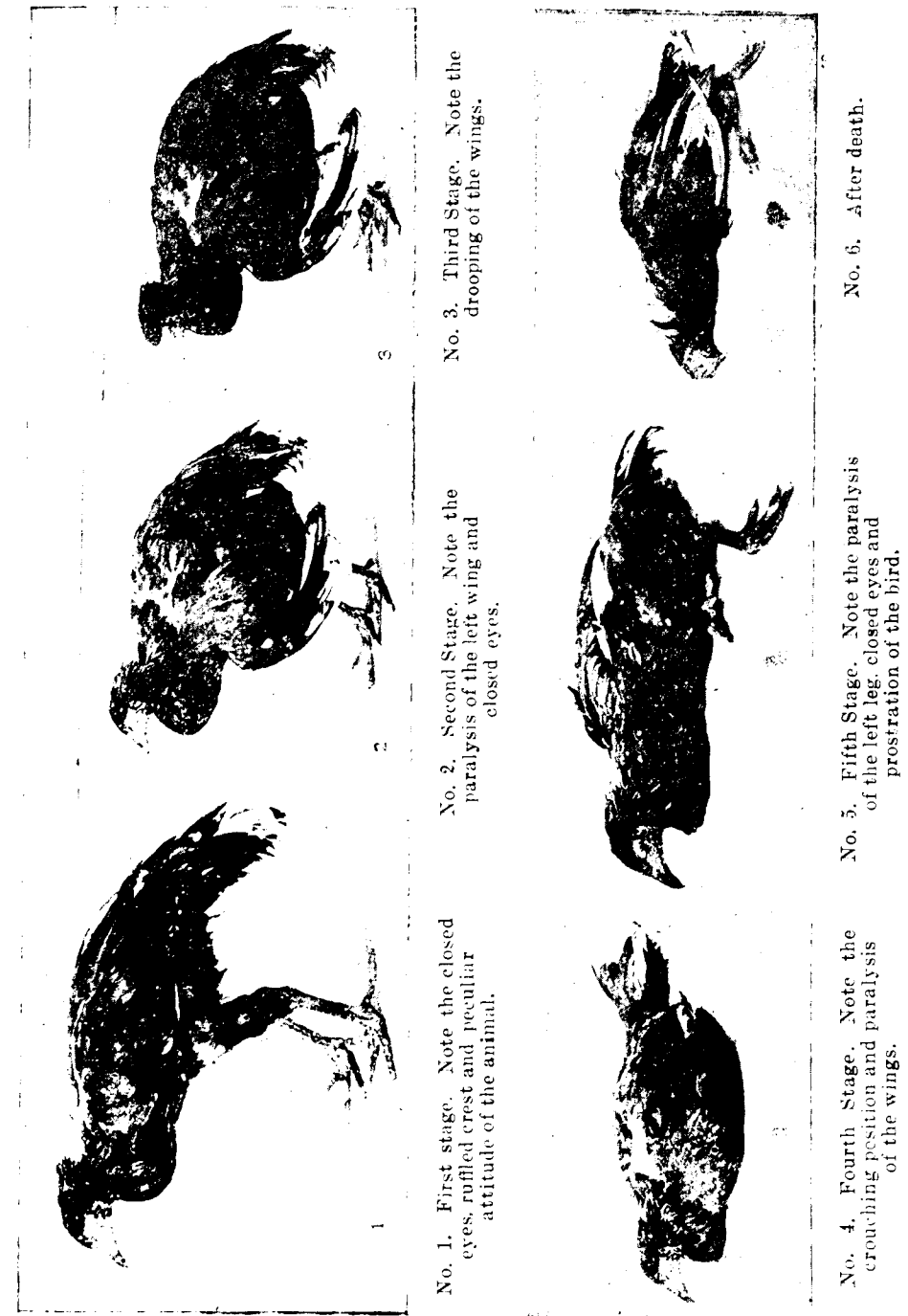
The nomenclature of this disease is somewhat confusing for several writers have within recent years described what appears to be one and the same pest among fowls under different names such as "New Castle Disease", "Ranikhet Disease", "Pseudo-Fowl pest", "Fowl pest", etc

A widespread Outbreak of this disease occurred during the year 1929-30 in the City of Madras and in the districts. Several cases in different stages of the disease came under observation, thus affording an opportunity to study the disease in some detail.

The disease was rather sudden in its onset, the affected birds in a few cases not showing any apparent illness and

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

Photographs of the Fowls in different Stages of the Disease.



Fowl No. 130.



Note the hæmorrhage at the subcutis in the regions of the neck and thorax (left side).

Fowl No. 1003.



Note the engorged condition of the blood vessels of the subcutis (left side).

dying suddenly. In some cases, they were very dull and depressed, not able to stand on their legs; dropping of the head and discolouration of the comb and wattles were noticed; whitish diarrhoea and coma followed by death; a few others did not feed, the mouth gaping with frothy discharge and dribbling of ropy saliva from beak; dyspnoea; a rise in temperature falling to sub-normal before death, duration of the disease being 3 to 10 days. (Photographs appended).

2. Experimentally infected birds refused food, were dull, feathers ruffled and assumed a crouching position; there was dropping of the head and in some cases dribbling of saliva; the eye was closed or partially closed and sometimes there was discharge present; the cloaca became soiled with diarrhoea which was whitish or greenish white in colour; the birds became very weak, exhausted and comatosed and they finally died. Dropping of the wings and paralysis were also noticed in a few cases. The carcass presented a dry and stiff appearance. Average duration of illness was about 4 days.

3. Among the important post mortem lesions may be mentioned a general congestion of the blood vessels of the subcutis and mesentery; congestion of the pharynx and alimentary tract with punctiform hæmorrhages over the epicardium and in the proventriculus; an acute gastro-enteritis with presence of bran-like deposits in the intestines and cloaca and congestion and pin-point ulcerations at the cloaca (vide illustrations). The blood smears were negative for organisms and the cultures revealed no growth.

4. Infection is said to be capable of being transmitted by saliva, stomach and intestinal contents and perhaps blood and tissues such as liver, spleen, kidneys and nervous tissue. It was decided to conduct some transmission experiments.

A healthy fowl was inoculated with 2 c.c. of a mixture of blood from a natural case of the disease in N. S. S. and another healthy fowl was drenched with 5 c.c. of the intestinal contents. Both the fowls contracted the disease in an acute form and showed typical post mortem lesions. Series of transmission experiments were also conducted with the liver and spleen emulsion. It was found that infection could be readily established with the above materials.

8. As no protective vaccine or serum for this disease is now available and as some biological products to tide over an outbreak would be a great boon to those interested in poultry farming, experiments were undertaken to see what could be done.

An immune serum was prepared from fowl No. 74. This was inoculated into a fowl, No. 138, dose being 3 c. c. After 24 hours the fowl was injected with liver emulsion from a bird that contracted natural infection with the result that fowl which received the virus and serum died after 1½ days showing characteristic lesions of the pest.

Another fowl, No. 146, was inoculated with 3 c. c. of the serum and was tested with the pest virus after 24 hours and subsequently after a week. This fowl died after a period of 10 days revealing lesions of the disease on post mortem examination.

An opportunity presented itself for testing the effect of the serum on infected birds. Three naturally infected birds showing clinical symptoms of the disease were received from the Moffusil for biological study. One of the fowls was inoculated with 3 c. c. of the serum. During the period under our observation, this fowl, exhibited symptoms of constitutional disturbance, dribbling of stringy saliva from the beak, inability to move about, a crouching posture, and later on, recumbent with unsteady limbs, paralysis and death. Post mortem revealed characteristic lesions of the pest. Tests so far conducted with the immune serum have been unsatisfactory unlike the results obtained by some other workers.

9. Liver and spleen tissues of fowls that had recovered from an attack of the disease under investigation were used in the preparation of a vaccine to try its effect in the field, if possible against this widespread disease causing heavy losses to poultry owners.

With all sterile precautions, the liver and spleen from fowl No. 18 mentioned previously were preserved in sterile 50 % glycerine in a flask for the preparation of vaccine.

Technique.—Made an emulsion of the liver substance in 1 to 10 dilution of normal saline in a mortar. Prepared 400 c.c. of stock emulsion in two flasks of 200 c.c. each. To each of the

Fowl No. 1003.



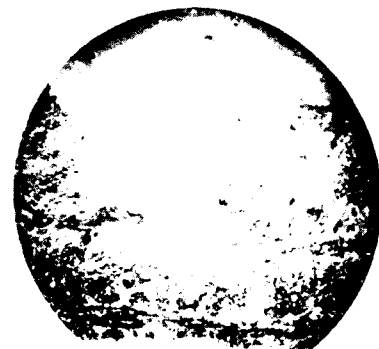
Proventriculus and intestines showing the presence of ulcerations and branlike deposition on the mucous membranes of the intestines.

Fowl No. 1003.



Note the engorged condition of the blood vessels of the subcutis (near view).

MICROPHOTOGRAPHS.



1. Section of proventriculus showing mucosae and gastric glands. Note the distortion of the gastric follicles.
2. Section of proventriculus showing haemorrhagic areas in the follicles.
3. Section of bran-like deposits in the intestines.
4. Section of bran-like deposits in the intestines (magnified).
5. Section of intestines showing distortion of the villi.
6. Section of intestines showing distortion of the villi (magnified).

flasks (1 and 11) 2 c.c. of Tuluol (1 % strength) was added. Incubated flask 1 at 37° C for 72 hours and flask 11 was heated to 60° C for one hour each day for 3 days. The contents of both the flasks were filtered separately into 2 flasks by means of a funnel and filter paper. To the filtrate of flask 1 which was incubated at 37° C was added 0.2 c.c. of liquid formaldehyde (1 in 1000 strength) and to the other filtrate heated to 60° C (flask 11) was added to 0.4 c.c. of chloroform (strength 1 in 500) and incubated at 37° C for 24 hours. The filtrates were tested for sterility.

Flask 1 (formalised) was found to be sterile and the filtrate clear. The same was stored in ice chest. A rabbit and a fowl were inoculated with 1 c.c. of the vaccine with no harmful effect. Flask 11 was found to be contaminated and the filtrate was also slightly turbid. However, the rabbit inoculated with 1 c.c. of this vaccine remained alive and showed no harmful effect. Owing to contamination this vaccine was discarded.

10. A series of controlled immunity tests were conducted and the results were found to be so good as to warrant the issue of the vaccine for use in the field. The reports received so far have been favourable, the mortality following vaccination of birds exposed to infection being negligible.

Summary.

The virus of the disease is ultra-microscopic. Culture tubes inoculated with virulent materials have remained sterile, nor could any specific organisms be demonstrated in the blood or other tissues of affected birds. The period of incubation as observed varied from 24 hours to 5 days, exceptionally over 5 days. From the tests made so far, it has been found that besides the saliva, alimentary contents and heart blood, the tissues such as liver, spleen and brain are highly infective. Liver and spleen and possibly brain tissue appear to be suitable material for vaccine.

The results of cross tests with rinderpest virus would seem to suggest a relationship between rinderpest and the pest among fowls. As regards immunity following vaccination, it is premature to say how long the immunity lasts. It would appear that at least 3 days must elapse after vaccination for birds to resist the infection.

Owing to the widespread outbreak of this disease in the city and in the districts, it was rather difficult to secure healthy fowls for experimental purposes, but all possible precautions were however taken in selecting the birds for the experiment. These were kept under observation whenever possible.

Further work on this disease is in contemplation.

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3. Dr. Noriohika Nakamura and Yutaka Kawamura, An experimental study on the virus of fowl pest etc., *Journal of the Japanese Society of Veterinary Science*—Vol 9 No. I, page 93.
4. Hugh Cooper, Mukutesar Laboratory, a Summary of the paper entitled Ranikhet disease.
5. Lt. E.W. Bevan—Some notes on virus disease.—*The Veterinary Journal* Vol. 86 No. 2, page 451.

Mr. R. Venkataraman, Laboratory Assistant was closely associated with me in this work and I wish to thank him for the care and enthusiasm while he did the work entrusted to him and my thanks are also due to Mr. S. Ganapathy, Laboratory Assistant for the help rendered in compiling this paper.

HERNIA IN FOALS.

BY

MOHAMMED DAVOOD,

Veterinary Officer, Government Stud Farm Kunigal.

(Continued from page 138 of 2nd issue of this volume)

In continuation of my article on Hernia in foals, published in the 2nd issue of Vol. VII of the Indian Veterinary Journal Madras, I would like to add that cases of hernia of very big sizes can be successfully treated by means of the most recent method of ligaturing the herneal sac, without any bad results whatsoever, that naturally threaten to follow. The following case was thus treated by ligature.

Subject :—Filly by Rostrum, out of Grand Dance.

Description :—Black, Kunigal Stud Bred, Filly, age one year and seven months.

History :—The animal was showing colicky pains very often and was running down in health, so much so that she was almost a skeleton.

Symptoms :—Locally there was a swelling at the umbilicus of the size of a small cocoanut, which used to be sometimes very hard and at other times soft enough to be pushed into the abdominal cavity through the opening in the abdominal wall, which could lodge in the tips of four fingers. Generally the animal was suffering from frequent flatulent colic of a rather severe nature. Bowels were irregular and the animal lost condition and was very much emaciated.

Etiology :—The swelling was congenital.

Diagnosis :—The case was diagnosed to be one of umbilical hernia on its characteristic features described in symptomology.

Prognosis :—Was rather unfavourable, the hernia being of a very big size.

Treatment :—On 1st August 1930, the animal was fed on simple bran mash and a little green grass.

On 2nd August, 1930, the following ball was administered early morning :—

R	Pulvis Aloes	dr. 4
	Hydrargyri Subchloride	gr. 40
	Ext. Belladonna Sic.	gr. 30
	Lini Semina Contusa	
	Treacle	q. s.
	M. ft. bolus.	

Sig.—To be given at once.

In the evening an enema of warm water and soap was given, following which walking exercise for half an hour was given.

3-8-30 :—Ligation.

Equipments :—

Two full curved needles.
Two straight needles.
Two artery forceps.
A pair of tissue forceps.
One aneurism needle.

Sterilised silk thread.

Four horse shoe nails curved almost semicircularly.

Hobbles.

Side lines.

Head collar.

Sterilisation:—A bucket full of phenyle lotion. The instruments were boiled in water for about half an hour along with a little of soda-bicarb, and then changed to another tray containing carbolic lotion 1 in 20.

Restraint:—The swelling, on being felt to be soft and reducible, the animal was cast on back on a clean straw bedding and on its either sides bags of straw were placed to keep her in position.

Preparation of the seat:—There being no hair at the umbilicus, the part was thoroughly washed with soap and water and was dried well. Then it was disinfected by means of Mercuric Chloride solution 1 in 500 and was painted ultimately with tincture of Iodine.

Technique:—The herneal contents were thoroughly reduced and the reducibility was made sure by the clean herneal rent that was felt allowing the fingers.

The two curved and sterilised horse shoe nails were then passed through the herneal sac which was held up by the assistant; and the points of the nails were turned out. The thick sterile silk thread was passed doubly through the middle of the herneal sac by means of the suture needle, and each thread was tied on either side with its fellow. Later on, the whole sac was strangulated by means of the remaining extra length of the threads and was ultimately knotted well surgically. The whole was then painted with Tincture of Iodine dusted over by Boro Iodoform to ward off flies etc. The animal was then released and a big three tailed bandage was placed over the neck of the animal to keep her off from disturbing the ligation.

Next day, there was found some swelling around the sac on the abdominal wall and it increased day by day for about a week so much so, that the ventral part of the abdomen became pendulous. The animal was slightly off food due to the

pain; but there was a rise in temperature that could have caused any suspicion towards peritonitis.

Further, the swelling below the abdomen reduced; but, the ligature became loose and consequently another ligature was put in its place, on the 5th day after the first ligature when the latter had cut about half the herneal sac. The wound was daily cleaned with Pot. Permanganate solution 1 in 500, and then dressed with Tincture of Iodine, dusted over with Boro Iodoform and bandaged.

On the 22nd day after the first ligation, the whole of the herneal sac, about the size of one and half times the first, dropped down leaving behind a raw surface. This was dressed daily antiseptically and the cicatrisation completed on the 20th Sept. 1930. The animal, meanwhile, slightly improved her condition and was discharged as cured on 22nd Sept. 1930. Thence after, she was let into the paddock along with other fillies; and no sequelæ followed. The filly has been now quite hale and healthy and the herneal rent is closed up totally.

The Chief Commandant, Mysore State Troops, Superintendent of the Stud Farm, Superintendent Civil Veterinary Department, Mysore and Col. Arther Olver. C.B., C.M.G., F.R.C.V.S., Expert Adviser in Animal Husbandry to the Government of India, were all pleased to see the animal healthy and the preserved herneal sac that had dropped down.

General Articles.

FORM IN WHICH TO REPORT POST-MORTEM EXAMINATIONS, TO BE USED WHEN FORWARDING VISCERA TO THE CHEMICAL EXAMINER

BY

T. S. RAJAGOPALAN G.M.V.C.,

Veterinary Assistant Surgeon, Trichinopoly Circle.

(Abstract from the Civil Medical Form No :—86 vide para 1106 C. M. code) adopted to Veterinary Profession in India.

(Continued from page No. 249 of 3rd issue of this Vol.)

I

From the:—.....(Name and Designation).

Dispensary

Veterinary—

Hospital.

Dated:—.....

To the:—.....(Chemical Examiner.).....

Description of viscera forwarded for examination:—

Full description or particulars regarding the viscera sent should invariably be stated. Thus it is useless to say—portions from stomach of the bullock: but it must be stated that it is, say, the most anterior portion of the reticulum of the bullock &c. Again it should not be stated that it is a portion of the liver but it must be, portions from the middle lobe or spigelian lobe &c., &c. Particular attention must be paid in mentioning the species, of the animal—Clearly state that it is from a horse—entire or gelding—bullock, cow, calf, heifer, dog or bitch &c., &c.

Mode of packing:—

Copy of label attached to each article:—

Weight of parcel:—

Impression of seal:—

Mode of despatch:—

Date of despatch:—

By rail-goods or parcel.

By road-post or through messenger, or police &c.

Form in which to Report Post-Mortem Examinations 351

Information furnished by Police or PRECIS of case:—

Name of the owner:—.....

Address:—.....

Description of the animal in full:—.....
Age, sex, colour, breed, height, and other distinguishing marks.

Belonging to:—(thana or village).....

History of the case:—

Date and hour of despatch of body:—

Date of receipt:—

Date and hour of autopsy:—

Name and designation of officer by whom examination was actually made:—

Appearance of the body:—

Condition:—Muscularity

Stout

Emaciated

Special Marks:—

Scars

Branding

Amount of hair and colour in different parts of the body and limbs.

Signs of decomposition:—

Wounds and bruises:—

Position:—

Character:—

Size:—

State of natural orifices:—

Eye

Ears

Nostrils

Mouth

Vagina

Anus

Urethra

State of limbs:—

Rigor Mortis

Position:—

Features:—Relaxed or contracted

Eyelids



JL

KZ m2, n2

N31.2.

Contents of mouth
 Position of tongue
 State of teeth
 Internal Examination :—
 Abdomen :—Subcutaneous fat
 Peritoneum
 Peritoneal Cavity, contents, nature of—
 Position of organs.
 Liver-Gall bladder if present—form, size
 (weight), edges, colour, consistency, sec-
 tion, capsule, nature of the contents of the
 gall bladder—diseased or injured &c.
 Spleen :—Weight, capsule, colour, consistency, section,
 disease or injury.
 Pancreas :—disease or injury.
 Kidneys :—Right and left—Weight, colour consistency
 and capsule, section &c.
 Stomach :—Size and general appearance of the outer
 stomach
 Appearance of the coat
 Interior and contents, appearance, odour, and
 quantity and quality of food materials.
 Intestines :—Outer surface-general appearance and coat
 Pyloric surface and contents
 Ileocecal valve
 Parasites and contents
 Mucous membrane.
 Generative organs :—
 Bladder and contents
 Uterus appearance size and contents
 Vagina, contents
 Thoracic Cavity :—
 Ribs :—
 Cartilage :—
 Pleura :—
 Adhesions
 Pericardium and its sac.
 Position of organs.
 Heart :—External appearance, shape
 Cavities :—Right auricle, ventricle
 Left auricle, ventricle

Weight :—
 Valves
 Endocardium
 Clots, anti or post mortem
 Muscular structure
 Blood vessels :—Clots
 Aneurism
 Atheroma &c.
 Lungs :—Appearance
 Colour
 Consistency
 Weight—Right and left
 Adhesions
 Section and density in water.
 Diaphragm :—
 Trachea, larynx, bronchi, glottis, œsophagus for foreign
 bodies or disease or injury.
 Head :—
 Bones :—disease or injury
 Membranes
 Brain substance and ventricles.
 Base of skull fractures, caries extravassation &c.
 The spinal cord-canal-need not be examined, unless any
 indication of disease or injury exists.
 Fractures and dislocations :—
 Place of fracture :—Mention name or names of the
 bone-bones.
 Kind of fracture :—compound-commuted &c., &c.
 If dislocation :—which joint and with how much of
 damage to the surrounding tissues.
 More detailed description of injury or disease :—
 OPINION AS TO CAUSE OF DEATH :—
 In my opinion :—.....
 Nature of the preservative used :—.....
 Date of supply of the preservative from the medical stores :—
 Samples of preservative sent in sterile glass bottles properly
 labelled, and sealed :—
 Station :— Signature :—
 Date :— Designation :—
 (Article exclusively for the Indian Veterinary Journal,
 Madras.—T.S.R.)

THE PRESENT DAY RICE BRAN AND ITS USE

BY

M. T. KRISHNASWAMY IYENGAR, G. M. V. C.,

Veterinary Assistant Surgeon, Ranipet.

Rice bran properly prepared forms an excellent article of food for cattle. But, after the installation of rice mills, in almost every village of North Arcot District, the quality of bran from the mills has become quite unsuitable for cattle; for all the husk with the small quantity of bran, is powdered and thrown out.

If paddy is not cleaned from stones, mud, etc., before it is given to the mill for husking, even the stones are powdered and sent mixed with the bran. Generally, people purchase this powdered husk and mud-mixed-bran at the cheap rate of six measure per anna or hundred measures a rupee and straightway feed their cattle till their stomachs are full. usually, for every Kalam or twelve marakals of paddy husked by the olden days method of husking, (in a mortar and pestle) 2 marakals of soft bran and 4 marakals of husk are separated. The major portion is the husk. Our ancestors were using the husk for purposes other than feeding cattle with or throw them away as useless. Now as the mills have replaced the mortar, no separation of husk from fine bran is wholly possible (even with the aid of a seive as the husk is also removed) or rather attempted at all by the public in view of economy. As a result of this routine daily feeding of cattle with this bran which the poor animals swallow under prompting of their appetite. I have observed that they never thrive well. In their young ages, by the constant use of this bran they never pass the natural solid faeces, but owing to the irritation in the intestines by the husk and mud (foreign bodies), diarrhoea is caused which disables and fatigues the animals very soon. At a later stage as the digestive power of the poor quadruped gets impaired, concurrent with the debility of the system, the husk and mud, etc., as they collect in the rumen get heavily impacted as a result of which the animal neither takes any food, chews its cud nor passes any dung. Bowels having become erupted from diarrhoea and the rumen fully impacted, any

number of enemas nor any quantity of stimulants or purgatives could not do any good, and except by performing rumenotomy as the last resource, the patient never survives. Thus as the poor ryot, could not get the pure bran now-a-days, he resorts to purchase this mixed bran at a cheaper rate, with which he thinks, he could fill its stomach, and extract the maximum of work. The result seen is gradual wasting, diarrhoea, impaction and death. One more interesting feature is, that as the poor animals get exhausted after constant motions, they become less inclined to feed properly. Many an ignorant ryot fills the stomach of the poor animal by forcible drenching of this bran mixed and shaken with water. I have seen at Erode, many oil-mill bullocks which are worked from morn till night, and which consequently have no time to feed, are actually drenched and stomach filled by the owners or their servants (drenching them with this stuff) in less time, at noon, to render them fit for work again till night. By such drenching accidents are not un-common. The above are my experiences about the use of the present day mill bran which was endorsed as follows by M. R. Ry. K. S. Natesa Ayyar, Avl., G. M. V. C., Ag. District Veterinary Officer, Vellore :

"This is one of the evil practice in vogue in North Arcot District, brought to the notice of the Veterinary Assistant Surgeon, Ranipet, by the large number of cases that attended for treatment there—Poor agriculturists are tempted by the cheap priced bran (100 measures a rupee) which in the long run ruins them by the loss of their cattle. The bran contains husk and other injurious materials, which deranges the digestive system, setting up diarrhoea or impaction, terminating generally in death."

M. R. Ry. H. C. Sampath Iyengar, Avl. G. B. V. C., District Veterinary Officer, Vellore, is of opinion that it should not prove a source of danger if it is given to cattle after the bran is passed through a seive.

NOTES ON THE REARING OF TIGER CUBS

BY

D. S. LAUD, G.B.V.C., F.R.H.S., F.Z.S.,

Superintendent, Victoria Gardens, Bombay.

If the tiger cubs are very young, i.e., below three months old they may be fed on goat's milk. A foster-mother goat should be obtained and the cubs allowed to suckle the foster mother; or cow's milk diluted with water ($\frac{3}{4}$ part milk and $\frac{1}{4}$ part water), should be given in a feeding bottle thrice or four times a day; or Horlick's malted milk may be given—say about 8 teaspoonfuls in 4 ounces of water; when about four months old, the cubs should be given in addition to the milk, some raw mutton, and if they digest the meat, it should be increased gradually, decreasing at the same time the quantity of milk. Till one year the cubs require to be looked after very carefully, particularly about the teething time or when they suffer from worms or digestive troubles. For worms "Santonin" in quantity of $\frac{1}{2}$ to 1 grain for young ones, once a month may be given when they begin to eat raw meat. In an adult tiger, the dose of "Santonin" is from 6 to 8 grains. For digestive trouble "Castor Oil" should be given. A teaspoonful or two teaspoonfuls is the dose of "Castor-Oil" for young tiger cubs: for adults the dose of "Castor Oil" is from 2 to 3 ounces.

The healthy stools are solid and passed twice or thrice a day, and are free from mucus or blood.

We give beef to our adult tigers in the gardens, the quantity for each adult being 12 to 15 lbs once a day, according to size, but cubs should be given mutton, and when they get used to it, then beef should be substituted gradually. Sometimes a fowl or rabbit may be given.

Diarrhoea, dysentery, distemper, paralysis, skin disease, worms and other gastric troubles are the commonest diseases in this class of carnivora.

In this garden, the young carnivora are allowed to stay with their mother, if there is one, till they are about 6 to 8 months old when they are nourished by the mother. They commence to chew meat from the third month and feed with the mother till they are six or eight months old. The cubs

while young are taken out from the cages and are allowed to play on the lawns with the keeper till they are six months old, when they begin to get troublesome and are dangerous to be handled.

WORK AMONG ELEPHANTS—SOME SUGGESTIONS

BY

R. S. GOVINDASWAMY, G. M. V. C.,

*Veterinary Assistant Surgeon, Tellichery.***Indigestion and Diarrhoea**

I was attached to the Forest Department at Nilambur as Assistant Veterinary Inspector for a period of two years and was in charge of 36 elephants and 26 buffaloes. The experience that I gathered in the management and working of elephants and particularly in treating them for such diseases as indigestion and diarrhoea, I am recording in this article. The Veterinary Assistant Surgeon in the Forest Department is responsible for the feeding of animals, their health and for the sanitation of the camp.

Elephants are less prone to attacks of diseases than other domesticated animals, probably because they are left more close to nature than other animals of work. They work and live in the forests side by side with wild elephants on the same soil and having the same fodder. The following table shows the diseases of elephants treated during 1927-28 and 1928-29.

Diseases of Elephants

Year.	Wounds.	Galls.	Indigestion or Diarrhoea.	Other diseases.	Total.
1927-28.	14	16	40	13	83
1928-29.	42	19	35	27	123

The other diseases include eye diseases, sprains, inflammation, abscesses and musth. (Musth is not a disease. It is only a physiological manifestation of what is called "Rutting".)

From the above table it will be seen that cases of indigestion and diarrhoea are common. The diagnosis of indi-

gestion and diarrhoea is very simple. When the dung is dark coloured and hard it is indigestion; when loose it is diarrhoea. The treatment of these conditions according to circulars is "ammonium chloride, potas nitras, and soda bicarb" for indigestion, and "creta preparata and pulvis gentian" for diarrhoea. The elephants are expensive animals, so, one cannot afford to try experiments on them in treatment. I was therefore content to follow the line of treatment already laid down. At the end of a year, I was surprised to find that not a single animal escaped such attacks and some suffered more than once, even though the food and sanitary conditions were satisfactory. A look into the case register for the previous five years revealed the fact that almost every animal suffered from indigestion and diarrhoea year after year.

The table is herein appended :—

Indigestion or diarrhoea cases treated from 1—4—1924 to 31—3—1929.

Name of elephant.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.
	Times.	Times.	Times.	Times.	Times.
Libera	7	7	3	3	3
Jhelum	7	5	5	1	3
Mauree	5	4	3	1	1
Loo	5	3	3	3	2
Kamatchi	3	2	1	2	2
Little Willy	3	4	3	1	1
Kuroki	4	6	—	1	1
Moulabaksh	3	4	3	2	2
Donald	3	1	3	1	1
Godavari	2	3	2	4	1
Kuttiparu	2	1	—	—	3
Nurmahal	2	1	2	—	3
Kitti	2	3	4	1	—
Narayanan	—	2	4	1	3
Valmiki	1	3	3	1	2
Frank	2	2	2	1	1
Togo	1	4	2	1	—
Kali	2	1	—	1	1
Krishnan	1	5	5	—	—
Thebow	1	3	2	2	3
Ramzanbi	...	New capture of 1928			2

The wild elephants also seem to suffer from these two complaints. I am often told that loose dung with worms are thrown out sometimes by wild elephants. I have seen freshly thrown out loose dung of a wild elephant with round worms $1\frac{1}{2}$ to 2 inches long, of ascaris species. On my way to inspect Elephant "Donald" at Nellikutta, I saw this kind of dung on the way and it occurred to me that this condition must be natural with all elephants. I talked to the elephant mahouts about this and I learnt that elephants eat mud before getting diarrhoea. All on a sudden some animals will refuse food, partly or wholly, without any apparent cause, while dung, temperature and everything else are apparently normal. It may bewilder a beginner at first, but experience will show that it is how animal behaves just before getting diarrhoea. If you examine the dung of such an animal the next morning it is either loose or hard, or coated. The worms may or may not be present in the dung. When an elephant refuses food, if you let it loose in the forest and if you follow it, you will notice that it eats the bark and root of *Miliusa Velutiana* (Kana kytha in Malayalam, or the bark of *Macaranga Roxburghii* (Podu anni) or the bark of *Careya Arborea* (Pezhu), or *Terminalia Tomentosa* (Karimarudu) or a kind of dark coloured, moist mud resembling that of a crushed ant-hill. If these barks are cut and given to the elephants at normal times they never touch them. There is little doubt that elephants select their own purgatives by natural instinct whenever there is irritation in their alimentary canal and try to get rid of the irritating matter. A few of the worms that may lose their hold on the intestinal wall pass along with the dung. Incidentally, I may mention that when the animals newly calve their milk supply is poor. If they are let free in the forest when their calves are able to accompany the mother, it has been found that their milk supply increases perhaps on account of their eating something in the forest guided by their instinct.

Indigestion or diarrhoea in elephants is not a serious matter at all, even if regarded as diseases. Invariably they get cured in 3 or 4 days whether medicines are given or not. Elephants Krishnan and Mumtuz Mahal got indigestion on one and the same day, on 1-5-1929. Krishnan was administered the usual medicines and Mumtuz Mahal was given no

medicine; both got alright on 3-5-1929. Medicinal administration to check the motions is contra-indicated unless there is super-purgation. Complete rest from work, withholding of grain food and allowing them to graze in the forest will be enough, when the dung is not normal.

Work of Elephants.

The elephants are by conformation said to be beasts of burden, but the Forest Department uses them for dragging logs of timber. Elephants are of great value from the point of their capacity for work. It is very difficult to lay a hard and fast rule as to the amount of work an elephant can do. In the Forest Department, the Inspector of live-stock fixes the working capacity of each elephant. The height, age and build of an animal are taken as a basis for determining this capacity. When an animal is 6' 9" it is allowed to drag a log 25 c. ft. a day.

7' and above	"	30 c.ft.
7' 3"	"	35 "
7' 6"	"	40 "
7' 9"	"	45 "
8'	"	50 "
8' 3"	"	55 "
8' 6"	"	60 "
8' 9"	"	65 "
9'	"	70 "

On the above basis Elephant Frank gets 65 c. ft., its height being 8' 10."

"Thebow" 45 c. ft. its height being 7' 10 "

"Moulabaksh 40 c. ft. " " 7' 7½ "

It is one of the duties of the Assistant Veterinary Inspector to see that this prescription for work is strictly followed. Anything beyond this is considered over-work. It is here that some times the Assistant Veterinary Inspector who is concerned with the health of the animals and the Forest Officer who is responsible for the work, come into conflict. The difficulties of the Forest Officer are many. He is responsible for the out-turn of work. He is always anxious to finish a given work as early as possible with the help of elephants. He is inclined to question the correctness of the working capacity prescribed according to height, when for

instance elephants like Frank, Thebow and Moulabaksh can almost run a way with logs of 65, 45 and 40 c. ft. respectively. It is true, to overwork an animal is cruelty, but to under-work is false economy. Therefore it is necessary to have a correct idea of each animal's capability. If the maximum capacity of an animal can be known, then a proper prescription of work can be given allowing a margin wherever necessary. Then there will be no question of overwork or underwork. Age in respect of captured animals and conformation are invariably matters of opinion. My opinion is that we can gauge the strength of the animal better from its weight than from its height.

In cattle, the weight is determined by the formula, $L \times G^2/300$ (all in inches). L stands for length from point of shoulder to point of buttocks and G for girth. I do not know if this is applicable to elephants. I had no chance to weigh an animal on a weigh bridge and compare the results. Lieut. Col. G. H. Evans, in his book "Elephants and their diseases" on page 7, has recorded length, girth and actual weights of some animals. But it is not known how the length was measured. The table as given in the book is reproduced below.

Weights and Measurements of Elephants

WEIGHTS AND MEASUREMENTS OF ELEPHANTS

No.	Sex.	Approximate age	Height Ft. In.	Girth Ft. In.	Length along Back.	Length along Side.	Weight in lbs.
1	Female	30	7.8	11.2	10' 8"	7' 10"	6278
2	"	20	7.1	10.3	9' 10"	6' 10"	5237.75
3	"	35	8.3	11.3	10' 9"	7' 7"	6296.25
4	"	30 to 35	7.3	11.2	10' 6"	7' 6"	6322.5
5	Male	30	8.4½	11.7	11' 4"	—	6460.5
6	"	40	8.1	11.3	11' 0"	—	5931.5
7	Female	30	7.8½	11.4	10' 4"	7' 9"	6322.5
8	"	30	7.8½	11.8	10' 0"	7' 6"	5748.75

Average height:—7'-9'1". Average weight:—2 Tons 14 cwts.

Remarks:—All the animals "In good condition" except No. 6 in poor condition.

(The following table regarding Frank, Thebow and Moulabaksh is given below to show comparison with Lieut. Col. Evan's figures recorded above.)

Name of elephant	Sex.	Age.	Height.	Girth.	Length from shoulder to buttock.	Weight in lbs.
Frank	Male	40	8' -10"	12' -7"	8' -3"	7857
Thebow	"	51	7' -10"	11' -8"	7' -10"	6141
Moulabaksh	"	28	6' -8"	11' -2"	7' -6"	5386

Average height:—7'-9-3". Average weight 2 Tons 16 cwts.

From the above it will be observed that the average weight of an animal viz., 2 tons 16 cwts according to the formula very nearly corresponds with the average weight viz. 2 tons 14 cwts. obtained by Lieut. Col. Evans from actual weighment of elephants. So I think for all practical purposes the formula can be depended upon for ascertaining the weight of an elephant.

If it can be prescribed at 10 c. ft. for every 1000 lbs. live weight which may be considered as reasonable for any draught animal either horse or cattle, then Frank gets 80 c.ft. Thebow 60 c.ft., and Moulabaksh 50 c.ft., taking fraction of 500 and above as 1000 lbs., and omitting the rest. This shows that the log to be dragged according to weight is 15, 15, and 10 c.ft., more than what each animal has been prescribed according to height respectively. It will be of very great help to know the actual weights of elephants year after year to ascertain their health and working capacity. If there should be any wasting disease it can very easily be understood by noting the weight than by mere appearance which is very deceptive. It may be impracticable to march all elephants to a distant place where a weigh bridge is or hire and bring a weigh bridge to the elephant camp every year, but to own a weigh bridge may not be too costly for an establishment like the one at Nilambur.

The Method of Work

The way in which an animal is worked has much to do with its health and longevity. There are two methods by

which the elephants do dragging work. One is dragging with harness and the other dragging by mouth. All the Government animals drag with harness. The harness consists of numdah, two wooden blocks, a back chain, drag chain, a collar and a coir rope for the girth. The numdah is made of leather 6 to 8 ft., long and 2½ ft., broad stuffed in with cocoanut fibre to serve as cushion. The wooden blocks are each 16 inches long, 9 inches broad and 5 inches high. The two blocks are connected by means of a string. The back chain is made of iron about 6 to 8 ft. long with rings on either ends. The drag iron chain is 30 to 35 ft., long and has two hooks at the ends. The collar made of iron wrapped up in cocoanut fibre and leather has also hooks at the ends. The number is put on the saddle place and the two wooden blocks are placed on it on either side of the spine. The back chain is placed on the blocks across so that the two rings may rest on the lateral sides of the chest wall. All these are secured to the body by the girth rope. The collar from the front and the drag chain from behind are attached to the rings of the back chain by hooks. This completes the harness. The complete harness of Frank weighs 249 lbs. The cost of a new harness and its upkeep may amount to Rs. 125 in a year. There is difference between the harness of an elephant and that of a horse in degree. The elephant can never boast of a pronounced wide chest like that of a horse which drags a load placed in a carriage. The elephant drags a log on the ground attached to the drag chain. The collar presses on the points of the shoulders while the elephant is at work and causes inflammation and abscesses thus rendering the animal unfit for work for some considerable time. Valmiki with inflammation and subsequent abscesses on the point of shoulder was unfit for dragging work from 13-3-'28 to 20-4-'29 except for two months; and Moulabaksh was similarly unfit for work from 22-2-'28 to 24-9-'29 except for two months. If there is a very big log for example 170 c. ft., 3 or 4 animals are employed at it. It is not possible to make all the animals pull simultaneously. When the mahouts order the animals to pull, one of them pulls with all its strength and stops. The others do the same one after the other, until chance unites the effort. The wooden blocks make impressions on the back in such instances on

account of the pressure which causes saddle galls. If there should be an obstruction to the log for example a stump of a tree or a stone, the elephant cannot see it, and if the mahout also does not notice it, the animal pulls hard until the obstruction is overcome it. This not only exhausts the animal but also causes undue pressure on the back and points of shoulders. The elephant has to walk according to the directions of the mahout with a log attached to the chain. The animal sometimes avoids an obstruction if it observes it in time. When they work on sloping ground, if the log by chance roll down, they are hurt sometimes, or the log chain gets entangled in brush-wood. If during work the chain breaks or the chain hold on the log slips off, there is very great danger. I have known of three instances of this kind, fortunately there were no injuries.

The other method is dragging by mouth. All that is required for this method is a special fibre rope about 6 to 9 feet long, thick at one end and thin at the other. The thin end is tied to the log through the drag hole and the thick end is given to the elephant to bite between his molars and drag. All except Government animals drag by this method. This is a very simple indigenous method. To make a new rope and to keep it in repair it may cost about Rs. 2/- to Rs. 3/- per week. It is said that the rope if put in water every day immediately after use lasts for 10 or 12 days. It is very interesting to see an elephant drag logs by this method. The big logs that cannot be dragged by the harness method can be dragged by this method. All the private elephants of Malabar, Cochin, Travancore and some other parts of Northern India are worked in this method. When a heavy log has to be dragged the animal takes a firm grip of the rope between his teeth, and having twisted the trunk round the rope drags the log. In private forest the ends of the logs are rounded off, so as to slip away when it meets an obstruction. In addition to it, the elephant can see for itself any obstacle and avoid it, or lift up the end of the log and place it on the obstacle to overcome it. The importance of this method is that while working on slopes, if the log moves faster than the animal can walk, the animal leaves the grip and escapes danger. If the fibre rope is found to be weak at any part, the animal feels it before he applies full force to pull it and gives up the

attempt thus avoiding any mishap. A bullock is strong at the neck, a horse at its chest and an elephant at its neck and head. These strong points of the elephant are made use of in this method of dragging and I think this accounts for their dragging heavier loads than those that drag by harness.

I have examined about 23 elephants belonging to private owners. There was no disease of teeth even in a single animal. One animal had the anterior angle of the molar chipped off. One aged about 45 had tumour on the right cheek. Another very old animal had abscess on the cheek, fore legs and thigh. When this animal had so many abscesses on the left side she was made to drag on the right side. A 60 year old cow elephant was dragging 120 c. ft., of log and had neither wounds nor abscess, nor bad teeth. The disadvantages of this method is that the elephant gets disfigured in its old age on account of thickening, on the cheek and legs. So far as appearance of an animal is concerned this method may not compare very favourably with the harness method, but from a practical point of view this may be considered to be a good method, because much heavier logs can be dragged more easily and with less danger. Caries or injuries to the teeth are feared more than any other by this method. In Nilambur there are about 120 elephants belonging to private owners and every one of them drags logs by the mouth, while the few maintained by the Government work by harness method. If by the mouth-dragging method they should suffer from diseases of the teeth or make their teeth unfit for mastication, perhaps the private owners, especially those owning one or more animals will not stick to this method. The teeth in elephants are peculiar. "The teeth are large, complex and special only to that kind of animal. Only two molars as a rule are seen on each side of the jaw; these are pushed out and replaced by others growing from behind." Col. Evans in his book on "Elephants and their diseases" on page 66 describes as follows:—

The first set of grinders or milk teeth are not shed but are gradually worn away during the time that the second set are coming forward; and as soon as the body of the grinders is worn away, the fangs begin to be absorbed. From the end of the second to the beginning of the sixth year the third

set come gradually forward as the jaw lengthens, not only to fill up this additional space, but also to supply the space of the second set which during the same period gradually wear away and have their fangs absorbed. From the beginning of the sixth to the end of the ninth year the fourth set of grinders come forward to supply the gradual waste of the third set. In this manner to the end of life, the elephant obtains a set of new teeth as the old ones become unfit for the mastication of his food.

To summarise the disadvantages of the harness method are:—

1. The harness causes injury to the animal. Inflammation and abscess and saddle galls are quite common.
2. The animal is strained at the shoulders and back which are not its strongest parts.
3. There are risks while working on slopes.

As against these the method of dragging by mouth has the following advantages.

1. Comparative freedom from bodily injuries.
2. It exercises the strongest parts of the elephant viz. the head and neck.
3. Heavier logs are pulled and more work is turned out.
4. The animal is able to use its intelligence in overcoming obstacles.
5. There is little risk even when working on slopes.

It is claimed that elephants that drag by mouth live longer than those that work by the harness method. I venture to suggest an experiment be carried out selecting some elephants to work by the mouth and an equal number to work by harness, and compare the difference in the cost incurred, time taken to finish a given work and weight added or lost, etc.

The facts noted above and suggestions I have ventured to offer are the result of my observations during my short experience with elephants in the Nilambur forest. This article is published in the hope that others with wider experience may kindly offer some constructive criticisms.

Clinical Articles

FOREIGN BODY IN THE OESOPHAGUS

BY

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Subject:—A country bred heifer, in apparent good health, 3½ years old and owned by a clerk was admitted into the out-patient clinic on 15—9—30.

History:—She was not showing good appetite for the last two days, and she took only a small quantity of green fodder with reluctance. Although thirsty, drank only very little plain cold water, constantly sipping and leaving it.

Symptoms:—She was having an anxious facial expression, and was restive—partial inability to swallow. Frequent extending and stretching of the head. Oedema of the throat and oesophageal furrow. Pain and extreme tenderness at the region of the throat. Rumen slightly tympanitic. Dung constipated. Conjunctiva injected. Breathing normal. No salivation or eructation. Temperature normal. Frequent attempts to swallow something. Half a pint of water was given as a drench, which was swallowed with difficulty, producing small intermittent gurgling sound during the act of deglutition. The region of the throat and its adjacent parts in the oesophagus, on palpation, were found to have been subjected to a traumatic injury with something hard and pointed, stuck up at the upper end of oesophagus.

Diagnosis:—The animal was diagnosed to be suffering from an injury to oesophagus caused by the presence of a foreign body.

Prognosis:—Not unfavourable.

Treatment:—As the obstruction was fixed up close behind the pharynx, it was decided to remove it, if possible, through the mouth alone by gentle traction and manual removal fixing a Reliance Mouth Gag. With this in view, she was kept in a

secure steady position, with her head extended and lifted up, after the application of the gag. The foreign body could be felt with the tip of the middle finger, but could not be extracted conveniently, without injury to the glottis and its adjacent tissues. With the help of a pair of dressing forceps, the offending material was grasped and carefully removed, aided by gentle external manipulation of the object; and it was found to be an ordinary iron sewing needle, 2 inches long, bent and rusty. It is surmised that the animal would have picked up the needle along with her morning concentrated ration!

The following drench was given her, after hot water fomentations to the throat and œsophageal region in the neck.

R

Acid carbolic..... 1 dram.

Oleum Lini..... 1 pint.

M. Ft. haust, Sig, luke warm.

Diet :—Thin rice gruel, adding common salt to taste, and ripe plantain fruits soaked in Castor oil were given two or three times daily.

The patient attended the infirmary for four days more, and was discharged cured, during which period a pint each of normal saline solution was given her as a drench in the mornings, and the hot water fomentations were repeatedly followed by stimulating embrocations. The heifer made an uneventful recovery.

TERATOMA. (Dermoid Process.)

BY

ABDUL MAJID, G.P.V.C.,

Veterinary Inspector, C.V.D., Sukkur, Sind.

The accompanying photograph of a bull snapped by Mr. C.S.G. Haji, G.B.V.C., Veterinary Inspector, C.V.D., Lower Sind Circle, is sent for publication.

The subject is a full grown, medium sized bull, belonging to Royal Deccan Circus Company. The bull has a "Teratoma" (Dermoid Process) situated just behind the hump. The attachment of the teratoma at the base is oval in shape

having some fatty connective tissues. There exists a fully developed metacarpal bone, bifurcated at its lower third, with which are joined four perfect digits and claws. This phenomenon is a portion of another embryo, the rudimentary cells of which might have perished in the uterus and only a few embryonic cells representing the portion stated above, attached to its co-foetus (the bull). Bulls having such phenomena are called "Nadiya Bulls" in Upper India and considered sacred by orthodox Hindu devotees, who pay homage to them by giving alms to the priests who care for such bulls.



It will be out of place here to quote theories of Medical and Veterinary Scientists regarding Histogenesis of teratoma.

"A theory enunciated by Cohnheim, ascribed the inception of tumours, generally, to misplaced embryonic rudiments cells or aggregation of cells, which become displaced during the complicated shiftings of embryonic tissues during the developmental process. In this way the epidermal and mesodermal cells may have become included in the ovary at an early period of embryonic development, and such cells after lying dormant possibly for many years, may become active and give rise to growths consisting of epidermal and mesodermal structures. This was conveniently spoken of as theory of *embryonic rests*.

Again many writers have attempted to explain the occurrence of teratoma by associating them with those 'aberrant

forms of pregnancy which result in the production of "conjoined twins or with the duplication or dichotomy or different parts the foetus". "*Gynaecology by Thomas Wattas Eden, M.D., F.R.C.S., F.R.C.P., (R.A.M.C.) and Cuthbert Locker, M.D., B.S., F.R.C.S., F.R.C.P., Page 696 & 697 (1916 Edition.)*"

"Teratoma is usually considered to include monsters or monstrosities of a developmental nature. In this sense it includes many of those extraordinary and often weird-looking objects, which result from some irregularity in intra-uterine growth, such as two headed calves, eight legged lambs, foals with only one median eye, etc. The word is also used to include those growths of otherwise perfect individuals where a twin, or a portion of a twin is included within the body of the first individual. Thus in a horse's testicle and sometimes in the ovaries, there may be found a collection of skin, hair, teeth and other irregular tissues enclosed within a covering envelope. These growths are not of the nature of neoplasms (New growths), but are rather portions of, in rare cases, complete though minute individuals which, had development proceeded normally, would have been twins with the perfect individual in whose body they subsequently are found. (Veterinary Dictionary by Williams C. Miller, M.R.C.V.S., pages 1006 and 1007, 1928 edition.)"

A CASE OF VOLVULUS OF INTESTINE IN A BUFFALO-COW

BY

PREM NATH KAK, *Kashmir State Scholar,*

Final Year, Punjab Veterinary College, Lahore.

My plea for recording this case is that it is the first of the type seen in our hospital and diagnosed as such while alive. Not only this, but it is one of the rare cases met with amongst buffalo-cows.

Subject :—A black buffalo-cow, aged about 8 years.

On the 7th January 1931, at about seven in the evening the animal was brought to the hospital with the history of suddenly developing colicky pains, since four in the afternoon.

A Case of Volvulus of Intestine in a Buffalo-Cow 371

She was being fed on usual diet of bhusa and gram, etc., and no unusual symptoms were evidenced before the actual onset of colicky pains. The bowels have not moved that day and she ceased ruminating in the afternoon.

The owner drenched her with some country medicines but to no effect. She appeared to suffer from very acute agonising colicky pains. She was very restless, showed anxious expression of countenance and excessive pain evidenced by lying flat on the ground, making incessant attempts at rolling, rising up immediately and throwing herself down violently reckless of getting any injuries.

She was put in a well bedded stable and proper examination conducted. Nothing abnormal was found in the mouth, rumen not distended, respiration quick and shallow, numbering 25 and pulse hard, 50 per minute. Temperature 100.8° F. and mucous membranes injected. Lungs and heart sound and normal.

Rectum contained a small quantity of semi-liquid faeces and its further examination could not be conducted owing to enormous straining. Bladder felt partially full.

Treatment :—The definite diagnosis of volvulus indicated no favourable prognosis. However palliative treatment was started and to allay pain in the first instance Chloral Hydras two ounces with treacle and water was drenched and abdomen massaged.

Soap and warm water enema were given and repeated every two hours. At eight in the night temperature 101.1° F., respiration accelerated, pain severe with no signs of its abatement and expression of animal very dejected.

A draught containing one pint simple oil, two ounces of turpentine, one ounce of Tincture Asafoetida and one ounce Spirits Chloroform, was given at once and enema repeated.

At nine animal was observed to continue making constant attempts at rolling like horses in colicky pains.

Electuary containing two drams of Potash Chloras, two drams Extract of Belladonna three drams Ammonium Chloride and sufficient quantity of excipient administered and body massaged.

Catheter passed, urine removed and enema repeated.

Early morning of the 8th of January 1931, the animal was noticed to be exhausted but continued to show picturesque pains with no signs of improvement. Temperature 101° F. and mucous membranes very injected.

Enema repeated and a draught containing one ounce of ammonium carb, three drams of pulv. nux. vomica and three pints of aqua was given at once.

At 4 O'clock, animal passed urine and continued to be restless. Morning draught repeated.

January 9th:—Animal showed no improvement in any way, temperature 101.4° F., mucous membranes very injected, animal exhausted with constant getting up and lying down. No faeces passed.

Previous day's draught repeated and enema given.

Animal died at 2 P.M. due to exhaustion. Post-mortem examination revealed complete twist of duodenum with inflammation of the gut.

Diagnosis and discussion:—So acute a pain as evidenced by this buffalo cow is very rarely seen amongst its species. Pain in cattle is characterised by:—

1. Peculiar double jerky kicking—kick not so forcible.
2. Grinding of teeth.
3. Swishing of tail.

Colic due to over-eating and such other dietetic causes would manifest this condition by adopting semi-circular crouching, attitude quickly lying on sternum, (not flat) occasionally kicking with upper hind leg and instantly rising up again and so on.

Symptoms, however, simulating those in question, I was told by the Officer in charge, could be seen in gut-tie which is met with only in male animals.

The train of peculiar symptoms presented roused curiosity amongst the students and to the surprise of us all, the case was diagnosed as of Volvulus of Intestine (pain arising from very acute obstruction) by L. Durga Dass, Professor of Medicine, Veterinary College, Lahore.

Intussusception was excluded owing to its occurrence usually in small animals due to worms and moreover it affects

large intestines and faeces may continue to pass. Rectal examination may also reveal its diagnosis.

This clinical case record, will, I believe, be of some interest to the profession on account of its very rare occurrence and its accurate diagnosis.

A REPORT ON THE CHEMICAL ANALYSIS ON CALCULUS TAKEN OUT ON POST-MORTEM FROM THE INTESTINES OF A POLO PONY MARE.

BY

D. S. LAUD G.B.V.C., F.R.H.S., F.Z.S.,
*Superintendent, Victoria Gardens, Byculla,
Bombay.*

There are two kinds of Calculi, as described by some authors, which cause obstruction of the intestines, viz.—

(a) True Calculi and

(b) False Calculi or Hair Balls.

The difference consists in the composition of the calculus causing the obstruction; but in case where the false calculus enlarges in size, similar symptoms are produced.

True calculi are also termed Enteroliths or Bezoars. They consist of a central nucleus, which may be of foreign body like a nail, pebble, particle of sand or a portion of hard and thickened mucus around which in concentric layers are arranged salts of ammonia, magnesium phosphate and lime salts, phosphates of lime and magnesia, a small amount of silica, mucus and epithelium and organic matters derived from the ingesta. They are heavier than the false calculi and assume various shapes, form and size.

False Calculi—Aegagrophili or hair balls or cat hair, consist of fine vegetable hairs, surrounding the grains of oats, barley and other grains, and are derived from the animals themselves by their licking one another, especially when horses have depraved appetite.

Dr. B. D. Khote, L.R.C.P., L.R.F.P. & S., Chief Medical Officer of Rajpipla State in Gujerat, Bombay Presidency, sent me a specimen of the calculus with the following note:—

"Pathological specimen taken out from the horse's intestines after post-mortem. A Polo pony, all of a sudden, last week had an attack of Colic, and the mare died after 14 hours. The age of the mare is about 14 years. The mass was removed from the floating colon which had twisted on its axis."

The Calculus was rounded in form and weighed about 12 ounces; and when broken, vegetable fibres with particles of hay could be seen therein.

The specimen was sent to Col. F.P. Mackie, I.M.S., Director of the Haffkine Institute in Bombay, who so kindly had it examined and sent me the following report:—

Qualitative analysis:—Chlorides, sulphates, oxalates, bile salts and bile pigments were found present in slight traces. Fat and glucose were present in slightly greater amounts; the quantities present were too small for quantitative analysis. Calcium was specially tested for and found absent.

<i>Quantitative analysis.</i>	<i>Percentages.</i>
Combustible organic matter NH_3	50.45
Silica	17.50
P_2O_5	12.70
Al_2O_3	10.44
Fe_2O_3	0.72
MgO	7.73
Total	99.54

My best thanks are due to Col. F.P. Mackie and his other staff for examining the calculus and sending the report. I am recording this case, as it will prove, I think, of great interest to the Veterinarian.

TREATMENT OF TETANUS IN HORSE

BY

R. C. CHOUDHRY

Veterinary Assistant Surgeon, Madhubani.

Subject:—One roan C. B. mare, 13 hands, 7 years, in good condition.

History:—On 20th May 1930, at about 3 P. M., I was called to attend a case in the town by Bazinath Dass who was an inhabitant of the village Loha Kapasia 9 miles off from the Madhubani Hospital in the district of Darbhanga.

Symptoms:—I found the pony in the advanced stage of opisthotonos affecting the muscles of the back, head and tail with spasm. The protrusion of the membrana nectitance (haw) was well marked covering the half of the cornea, the course of the levator humeri muscle was standing out very prominently and was found to be rigid and unyielding.

The trismus was well marked, the masseter muscles were rigidly contracted which compelled the mare not to take anything between the tightly clenched teeth. Nose was poked out and ears pricked up, head and tail carried erect.

Treatment:—The mare was placed in a clean dry stable and necessary arrangement was made for a dark room. Pure water and green grass were placed within the reach of the mare. On careful examination, I found a small wound with a cicatrix which was about to heal up, peeping through the hairs of the back with a thick layer of clay over it. It is well known to us that the bacillus of tetanus is "anaerobic" and produces its toxin under the condition stated above. Regarding the history of this wound I learnt from the owner that the mare had a saddle gall and he used to apply clay or mud everyday for curing the wound as instructed by the villagers or quacks. Taking all the precautions the hairs all round the wound were clipped, the wound was well cleaned and then cauterised with carbolic acid.

Without attempting the routine line of treatment, I tried the treatment successfully carried out by Dr. G. M. Fisher (from Practical Medicine) and which was published in the *Indian Veterinary Journal* of Oct. 1925, Vol. II. No. 2, Page 104. Instead of using Antitetanic serum which was costlier

than Tr. Lobelia Aetheris and according to the size and breed of the animal, this case was treated with the starting dose of 5 c.c. Tr. Lobelia hypodermically every three hours for three doses, at the same time the animal was internally given 4 ounces epsom salt in drinking water which it drank a little or nil.

On the second day when I was called again to see the Pony, I found the affected muscles to be in a more relaxed condition. Tr. Lobelia (1 dr) was again continued and was given only two doses this day and the same internal medicine was repeated.

On the third day the Pony was found taking grass and water from the ground and the muscles which were affected were found almost in normal condition. This day also the same quantity was injected twice and internal medicine repeated. Pure water and green grass were kept always within the reach of the animal.

The treatment was continued till the next day with the same doses. I learnt that after a week the animal was put to work. I saw the pony after a fortnight and found her quite healthy and sound. This case was inspected by the Veterinary Inspector of my Circle after a month, who instructed me to submit a report on the treatment, to the Special Officer in charge of the North Bihar Range, Muzaffarpur.

On 28th July 1930, I had an opportunity of treating another case of tetanus—a chestnut C.B., pony, 9 years, 12 hands, and in good condition. This was a case of "epros-thotonos" kind and quite reverse of the former case. I found the muscles of the belly firmly contracted and head was depressed by the contraction of the inferior cervical muscles and other symptoms were more or less the same as in the former case. This case was also treated with Tr. Lobelia Aetheris with similar success as mentioned above and the wound which was found in the hollow of the heel (near hind) was well scraped and cauterised with carbolic acid as in the former case.

As tetanus is one of the most common and fatal diseases in equines with which we have to deal with and as we have practically little or no remedy except the routine line of treatment with sedatives such as Chloral Hydrate, Hyoscyamus, Belladonna, Potassium Bromide, etc., and serum therapy,

the treatment with Tr. Lobelia may have a wide trial. I hope my fellow brethren will enlighten their experience through the columns of this Journal about the treatment of tetanus cases with Tr. Lobelia, which has been found very successful at my hands.

Extracts.

THE ELEVENTH INTERNATIONAL VETERINARY CONGRESS, RESOLUTIONS.

The following resolutions were passed at the Eleventh International Veterinary Congress, held in London, in August 1930, under the presidency of Sir John McFadyean, M. B., B. Sc., C. M., LL. D., M.R.C.V.S.

1. The plurality of foot-and-mouth disease viruses is a discovery of the highest significance in connection with the epizootiology of the disease, and also methods of active and passive immunisation.
2. It is highly desirable for every country to determine on all occasions the type of virus present.
3. Disinfection. It should be remembered that both the diseased animal and the buildings constitute sources of danger in the spread of the disease.
4. The most efficient disinfectant agents are moist heat and sunlight; and of chemical agents, potassium sodium hydrate and formalin.
4. The value of passive immunity has been established and its use in practice under favourable circumstances is to be encouraged.
5. It is highly desirable that all possible efforts should be made to discover an efficient method of active immunisation.

ANTHRAX (Control of Dissemination by Animal Products).

The community of interests of civilised peoples makes it an essential duty to take effective precautions for the protection of the health and life of human beings and animals against the dangers of infection with anthrax through animal products—unheated or insufficiently heated meat, meal or bone-meal, unheated or insufficiently heated bones and skins.

In connection with this danger, it appears that regulations are urgently needed to ensure that raw materials from animals free from anthrax or sterilised are introduced into trade. If the veterinary police regulations of the exporting countries are insufficient for this, it appears to be essential that the products should be sterilised or tested as to their bacterial content in the importing country before they are allowed to pass into general trade.

Only an exposure to steam under pressure for several hours can at the present time be considered satisfactory for the thorough disinfection of animal products infected with anthrax.

Rinderpest.

This Congress expresses the view that sufficient knowledge of practicable methods is now available to eradicate rinderpest within a reasonable period of time in any country which will provide adequate facilities for their application, and this Congress urges all Governments to co-operate to this end.

Infectious Abortion of cattle, Sheep and Swine.

The 11th International Veterinary Congress considers that scientific investigations regarding contagious bovine abortion, which is responsible for serious losses to agriculture and domestic economy, are essential in all civilised countries, and particularly for the purpose of controlling the disease, for the preparation of an effective method of immunisation, for the elucidation of the question of the *Bacterium abortus* Bang as a cause of disease in man, and the relationship between the disease caused by this organism in man and Malta fever. In view of the very wide spread occurrence of infectious abortion of cattle in all civilised countries, an international scientific investigation should be carried out, and it is indicated that this investigation comes within the purview of the International Bureau of Animal Diseases in Paris.

Fowl Typhoid and Bacillary white Diarrhoea.

The Congress expresses the opinion that the method of diagnosis and prophylaxis of bacillary white diarrhoea of chickens by systematic agglutination tests carried out by qualified veterinarians is at the present moment the procedure most to be recommended.

Diseases of the New-Born.

Having regard to the good results of the organisation for combating diseases of the new-born in Germany, the Congress recommends that in all other countries similar organisations be established, and that in due course these organisations be united into a world-wide federation.

Standardisation of Biological Products.

The 11th International Veterinary Congress draws the attention of the Office International des Elizootique, Paris, to the urgent need of a prompt study of the question of the standardising of Veterinary Biological Products.

The Law Governing the practice of Veterinary Medicine and Surgery.

The 11th International Veterinary Congress asserts the necessity of State regulations for the general control of the health of domestic animals.

That the title of veterinary surgeon ought to be legally protected and that only those should be authorised to practice animal medicine who possess a diploma either granted or recognised by the State.

Relationship of the Veterinary Surgeon to animal Husbandry.

The Animal Husbandry (Zootechny), in view of its immense importance to the people's welfare, be given a prominent position in the programme of every future International Veterinary Congress. In this way the field of activity of the Congress would be considerably extended and the Statutes should be amended accordingly.

The Congress also recommended the creation of a special Section in the next Congress for Meat and Milk Hygiene.

PROCEEDINGS OF THE LEGISLATIVE COUNCIL OF THE GOVERNOR OF MADRAS, ON 25TH AND 26TH MARCH, 1931, ON VETERINARY GRANT.

As reported in the Press.

The Hon. Mr. P. T. Rajan moved that the Government be granted a sum of Rs. 11, 50,900 under the head of Civil Veterinary Services.

Mr. R. N. Arogyaswami Mudaliar moved that the allotment of 11,50,900 be reduced by Rs. 100/- in order to urge that immediate effect might be given to the recommendations of the Royal Agricultural Commission. He said that it was certainly a very discreditable thing to allot only a sum of Rs. 11 lakhs for expenditure on the veterinary departments one of the vital activities of the State. The Commission had drawn the attention of the Government to the fact that the department was woefully undermanned. During the course of his investigation in connection with the Economic Enquiry Committee in East Godavari and Kistna districts, he had found the agriculturists unable to deal with the epidemic among the cattle. He found nearly 90 per cent of the cattle dead. At present there was only one Veterinary officer for hundred thousand cattle. This was utterly inefficient to supply medicines for cattle diseases. When money could be found for other departments, it was hardly convincing to be told there was no money to adequately meet the needs of this department. The inadequacy of the veterinary relief to the agriculturists was woeful and arrangements should be made to start serum manufacturing depots in the province. There was no use in saying that experiments were still being carried on in this matter. What was needed was adequate veterinary aid to the agricultural people.

Mr. M. B. Rangasami Reddiar.—said that last year when rinderpest was raging in North Arcot district and cattle were dying in hundreds the necessary serum was not available in the depots. What was the use of having a veterinary department if it was not of use in preventing cattle epidemics? Besides why should not Government open their own Serum Institute in this province? His suggestion would be to appoint in taluks officers who would have to look after co-operation, veterinary services agriculture. Besides he would urge Government to appoint a committee to examine to what extent indigenous medicine could be employed in combating cattle diseases.

At this stage the House rose for lunch,

Re-assembling after lunch, Mr. A. B. Shetty spoke on the cut in the veterinary demand. He emphasised the need for having their own serum institute in the province and giving more prompt medical relief in times of rinderpest epidemics. The Agriculture Commission had suggested numerous methods for combating and regulating rinderpest and had suggested legislation to bring about a uniform method in all places in the country. There was also the question whether the Veterinary College could not be affiliated to the university and a higher course provided for veterinary students. There was on the whole an evident neglect of Veterinary Surgeons. Indeed, the Veterinary Department seemed to be the *Cinderella of the Services* and he urged the importance of raising the pay, prospects and status of the members in this service.

Swami A. S. Sahajananda pressed on the attention of Government the need for extending veterinary relief to the villages.

Mr. V. I. Muniswami Pillai endorsed the suggestion for opening a serum institute in this presidency and urged the Government not to delay the matter any further.

Mr. A. Ranganatha Mudaliar said that there could not be any further doubt about the need for having their own arrangements for manufacturing serum in this province. The Mysore State was doing it and at a fourth of the cost incurred by the Madras Government. On grounds of economy and urgency, he would urge the Government to launch out on the scheme at once.

Mr. Basheer Ahmed said that in his constituency, particularly in South Arcot, there was utterly an inadequate provision for veterinary help and ryots who had suffered there owing to various causes had been further put to heavy losses on account of the death of their cattle in large numbers due to rinderpest. It was time they appointed some special officer to investigate the possibility of combating this disease effectively and find out the possibilities of a permanent cure. He hoped the Minister would take steps to hasten the arrangements for opening a serum institute in Madras Presidency.

Mr. Bayabhani Saheb said the need for efficient veterinary help was felt all over the province and urged the Government to do something to help the poor ryots in all possible ways.

26th March, 1931.

Mr. T. S. Ramaswami Aiyer wondered when the Government would stop experimenting and tinkering with the problem. When supplies were difficult and prohibitive in cost why should Government still continue to obtain their serum from Muktesar and not open their Serum Institute in Madras? Experiments carried on in Madras proved that the climate of Madras did not affect the potency of the serum; on the other hand, it was greater. While the Government carried on experiments, cattle were being carried away in thousands in rinderpest. When were the Government going to move in the matter? If they were really serious, let them start the institute in Madras, in a rented building if necessary. He feared the Veterinary Department was being starved, while other depart-

ments were having ample funds. The pay and status of the officers was not attractive, and many of the graduates of the college went out of the province for employment though their own province was undermanned in the Veterinary Department.

Mr. K. Ramachandra Padayachi pleaded for the necessity of taking effective measures to put down cattle mortality in the provinces. Unless this was done immediately, the agriculturists would suffer a great deal.

The Hon. Mr. P. T. Rajan said that the Government were trying, as far as possible, to cope with the situation with limited finances at its disposal. Last year mortality among the cattle was worse. The department staff were strained to the utmost to mitigate the sufferings among the cattle. Most of the members referred to the manufacture of serum. The experiment of manufacturing serum in the province was being carried on. Whether it would be manufactured in Madras itself was still under experiment. Last year about 100 doses of serum were supplied to the mofussil by the Director of Veterinary Department. All the students trained in veterinary work were being absorbed by the department. He believed the Director of Veterinary Services had instructed his subordinates to help the people with the supply of indigenous medicine, if they thought that it would be beneficial to the cattle. All the suggestions put forward by the members would receive careful consideration at the hands of the Government.

The cut motion was withdrawn, the demand was put and carried and grant was made.

Association News.

ALL INDIA VETERINARY ASSOCIATION, MADRAS BRANCH
PROCEEDINGS OF THE ANNUAL GENERAL BODY
MEETING OF THE ALL-INDIA VETERINARY
ASSOCIATION MADRAS BRANCH, HELD
AT THE MADRAS VETERINARY
COLLEGE, ON SATURDAY
THE 4TH APRIL, 1931,
AT 4-30 P.M.

Members present:—

- Messrs. 1. P. Srinivasa Rao, in the chair.
2. L. S. Parameswaran.
3. M. S. Sastry.
4. V. Janakirama Aiyer.
5. V. P. Subbayya.
6. M. Noor Ahmed.
7. P. A. Parthasarathy.

8. S. R. Ganapathy.
9. V. Periyaswamy Aiyer.
10. S. Vaidyanatha Mudaliar.
11. G. Theophilus.
12. G. R. Visvanathan.
13. M. S. Nathan.
14. T. Raghavan.
15. R. Venkatraman.

Minutes of the last meeting were taken as read and they were confirmed.

The annual report for the year ending 31st March 1931 was read with the statement of accounts and adopted unanimously with the suggestion that an appeal be sent to all the members in arrears.

Moved by Mr. T. Raghavan.

Seconded by Mr. P.A. Parthasarathy.

Election of Office Bearers :—

Mr. P. Srinivasa Rao, President.

Proposed by Mr. T. Raghavan, seconded by Mr. M. Moor Ahmed and carried unanimously.

Mr. T. Raghavan, Secretary.

Proposed by Mr. M.S. Sastry, seconded by Mr. V. Janakirama Aiyer and carried unanimously.

Mr. V. Jankirama Aiyer, Joint Secretary and Treasurer.

Proposed by Mr. V.P. Subbayya, seconded by Mr. G.R. Visvanathan and carried unanimously.

Members of the Managing Committee :—

- Messrs.
1. M. S. Sastry.
 2. T. Vinayaka Mudaliar.
 3. P. Thillanayagam Pillai.
 4. K. Samirasimha Rao.
 5. V. P. Subbayya.
 6. L. S. Parameswara Iyer.
 7. P. S. Kuppuswami Iyer.
 8. A. Ramalinga Mudaliar.
 9. M. Anant Narayana Rao.
 10. R. Swaminathan.
 11. T. R. Rajagopala Rao.
 12. G. R. Viswanathan.
 13. M. Noor Ahmed.

14. K. N. Raghavan.
15. L. Adinarayana Sarma.
16. S. Seshadiri Iyengar.

Proposed by Mr. T. Raghavan, seconded by Mr. V. Janakirama Iyer and carried unanimously.

The following five members be elected to represent this branch on the Central Committee of the All-India Veterinary Association.

- Messrs.
1. T. Vinayaka Mudaliar.
 2. R. Swaminathan.
 3. V. Janakirama Iyer.
 4. A. Ramalinga Mudaliar.
 5. T. Raghavan.

Proposed by Mr. M. Noor Ahmed, seconded by Mr. V. Periyaswami Iyer and carried unanimously.

Resolutions :—

1. Resolved that a sum of Rs. 100/- from the funds of this branch be contributed towards the working expense of the All-India Veterinary Association.

Moved by Mr. V. P. Subbayya, seconded by Mr. T. Raghavan, and carried unanimously,

2. That in view of the fact that the provincial annual conferences have got definite and useful purposes to serve the interests of the profession, it is resolved to hold the next provincial Conference in Madras on a date to be fixed up by the Managing Committee in consultation with those interested in the profession.

Moved by Mr. M.S. Sastry, seconded by Mr. V. Periyaswami Aiyer and carried unanimously.

3. With a view to provide an opportunity for the old boys of the Madras Veterinary College to meet one another, the present students and staff of the college and to exchange note, it is resolved to request the Principal Madras Veterinary College to institute an Old Boys' Association and to arrange for its annual meeting along with the annual sports in the College.

Moved by Mr. T. Raghavan, seconded by Mr. S. Vaidyanatha Mudaliar and carried unanimously.

4. This Association reiterates the resolution requesting the Government to take early steps to make it compulsory on the part of all Municipalities and the Panchayat Boards to engage the services of Veterinary Surgeons for the purpose of meat inspection in all places where there are Veterinary Institutions.

Proposed by Mr. M. Noor Ahmed, seconded by Mr. R. Venkatraman and carried unanimously.

Since it was already late and the authors of the professional papers did not attend the meeting owing to some unavoidable circumstances, it was resolved to publish them in the Indian Veterinary Journal.

The retiring Secretary Mr. M. S. Sastry thanked the members for their presence and co-operation. He said that this Association was started over 10 years ago with a humble beginning, the organisers were confident of hearty support and co-operation of the members throughout the presidency, and he was glad to say that the response was wonderfully generous and quick. This Association can look back with some amount of pride, the several achievements its credit. The part played by the Madras Association in organising the All-India Veterinary Conferences and establishing and conducting the Indian Veterinary Journal is a great credit to the members in this Presidency. He thanked his colleagues in the presidency for their hearty co-operation and help he received all through the year, in the discharge of his pleasant duties and he hoped that the new Secretary Mr. T. Raghavan will receive similar help for the continuous and successful work of the Association.

Mr. V. P. Subbayya proposed a hearty vote of thanks to the retiring Secretary for the valuable services rendered by him to the profession from the very inception of this Association in this Presidency. He felt proud that their Secretary has been elected General Secretary of the All-India Veterinary Association and he wished him all success in his office.

This was responded to heartily.

Mr. T. Raghavan thanked the members for the honour done to him in electing him as their Secretary and he requested for the hearty co-operation and sympathy of the members in his arduous work.

The President appealed to the members to evince greater interest in the affairs of the Association to keep up the fair name of Madras with a brilliant record work, and make the meetings more lively, interesting and instructive.

The College authorities were duly thanked for the use of the Hall.

The meeting which began with tea and light refreshments terminated with a hearty vote of thanks to the chair.

MADRAS. } P. SRINIVASA RAO,
4-4-1931 } *President.*

REPORT OF THE MANAGING COMMITTEE OF THE ALL-INDIA VETERINARY ASSOCIATION, MADRAS BRANCH

For the Year Ending 31st March, 1931

Members:—There were 184 members on the rolls of the Association on 1-4-1930. No new member joined, but there was a casualty in the death of Mr. A. M. Richards. Therefore, the year closed with 183 members.

Meetings:—The annual meeting of the Association was held on 19-4-30. and proceedings thereof were published in the INDIAN VETERINARY JOURNAL of July 1930. The Annual General Body Meeting which should have come off in Christmas week in 1930, was postponed to this date as the Secretary and other members were busy with the work of the Seventh All India Veterinary Conference during that period.

Delegation:—The President of the Branch attended the annual conference of the Mysore Veterinary Medical Association in Bangalore, in May 1930. 21 delegates from this Presidency attended and took active part in the Seventh All-India Veterinary Conference held in Bangalore on 27th, 28th and 29th December 1930.

The Indian Veterinary Journal:—This branch continued during the year, to help the Journal in its useful career. The Journal completes its Seventh Year of its existence, with the April issue which is about to come out now.

Propaganda:—The President of the Association and a few other members have continued to take advantage of all the available opportunities to educate the public in Veteri-

nary matters and to enlist their sympathy for the advance of the profession in all directions with the result that Veterinary matters are claiming the attention of the legislators in this Presidency and of the organisers of Ryot's Conferences as is seen in their numerous deliberations. It is hoped that such propaganda will also go to help and supplement the work of the Officials in the department, as the interest of both are identical.

Finance:—The statement of Receipts and Expenditure, which is attached to this report will show that there has been a very poor response from the members who have allowed large arrears to accumulate in spite of many reminders. It is hoped that this meeting will be able to suggest ways and means for realising these arrears.

Remarks:—The President who attended the annual Conference of the Mysore Veterinary Medical Association in May 1930, the Secretary and a few other members took an active part in helping the Reception Committee of the Seventh All-India Veterinary Conference to make the function, the grand success it was. The Secretary attended to the duties of the General Secretary of the Central Association, as the latter was unable to attend to them, owing to a family bereavement in the latter part of 1930. Arrangements had been made to provide light refreshments to the delegates of the Seventh All-India Veterinary Conference on the occasion of their visit to the Hosur Cattle Farm in this Presidency, but, the Farm Superintendent and his staff took us by surprise and entertained the delegates on the Farm.

The Association has been continuing to do its useful work for the advance of the profession and its members. The silent and unostentatious work of the Association will necessarily bear fruit in course of time, but, all the members of the profession should join the Association and take an active part in this useful work. It is hoped there will be a better response in the current year and the Association with a new Secretary will be able to rouse the dormant enthusiasm of the members, with an interesting programme of work.

V. JANAKIRAMAN 4-4-31. Joint Secy. & Treasurer	P. SRINIVASA, RAO 4-4-31. President.	M. S. SASTRY 3-4-31. Secretary.
	For the Managing Committee.	

A. I. V. A. Madras Branch, Statement of Account 387

**STATEMENT OF ACCOUNT OF RECEIPTS AND
EXPENDITURE OF THE ALL-INDIA VETERINARY
ASSOCIATION, MADRAS BRANCH.**

(For the period from 18-4-30 to 31-3-31.)

RECEIPTS.	Rs. A. P.	EXPENDITURE.	Rs. A. P.
Balance on hand on 18-4-30 ...	350 1 5	Printing ...	7 8 0
Subscriptions ...	120 0 0	Postage ...	14 12 0
Interest ...	9 12 11	President's touring charges ...	20 0 0
		Secretary's Do. ...	20 0 0
		Expenses At the meeting } ...	9 0 0
		Conveyance ...	0 8 0
		By Balance ...	408 2 4
Total ...	479 14 4	Total ...	479 14 4

To Balance.....Rs. 408-2-4.

Details:—

Savings Bank Deposit ...	Rs. 296 13 10
Cash with Mr. V. J. Aiyar ...	47 8 6
" " Mr. M.S. Sastry ...	63 12 0
Total	408 2 4

V. JANAKIRAMAN, 4-4-31. Joint Secy. & Treasurer.	} P. SRINIVASA RAO, 4-4-31. President.	M. S. SASTRY, 4-4-31. Secretary.
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College News

MADRAS VETERINARY COLLEGE

The following students of the Final year class of the Madras Veterinary College, have passed the annual examination held in March 1931 :—

- | | |
|-------------------------|-------------------------|
| 1. Alagarajan, V. K. | 15. Md. Sultan. A. |
| 2. Ananda Rao, M. | 16. Nagabushanam, A. |
| 3. Anantharaman, P. Y. | 17. Natesan, P. A. |
| 4. Bashyam Ayyangar. | 18. Raghavachari, K. |
| 5. Bavani Shankar. | 19. Rajagopal. M. |
| 6. Chellam, M. C. | 20. Rama Mohan Rao, T. |
| 7. Jamal Khan. | 21. Shaik Md. Ghazi. |
| 8. John, K. T. | 22. Singarachari, A. N. |
| 9. John M. J. | 23. Singaravelu, V. |
| 10. Kanakarajan, V. | 24. Subbu Singh. |
| 11. Kandaswami Raju. | 25. Sundarachari, S. C. |
| 12. Krishnaswamy, M. A. | 26. Uttaraiah Naidu. |
| 13. Krishnaswami, M. R. | 27. Vaidyanathan, S. N. |
| 14. Madhava Rao, B. | |

Five Students have failed

In class-B, 32 students out of 43 have passed. Out of the 11 failed candidates 7 will appear for the supplementary examination in June 1931.

In class-A, 28 students out of 39 have passed. Out of the 11 failed candidates 4 will appear for the supplementary examination in June 1931.

BENGAL VETERINARY COLLEGE.

The following students of the Final year class of the Bengal Veterinary College, have passed the Diploma examination held in March, 1931. Their names are :—

- | | |
|--------------------------|----------------------|
| 1. Balli, S. I | 9. Sen, M. R. |
| 2. Mukherjee, B. C. | 10. Daniel, M. V. |
| 3. Sen Gupta, P. C. | 11. Kochappu, M. A. |
| 4. Singham, K. T. | 12. Barbhuian, A. B. |
| 5. Zaman, M. A. | 13. Khan, M. A. |
| 6. Paul, S. T. | 14. Badruduza, M. |
| 7. Kesovan, T. R. | 15. Talukdar, B. N. |
| 8. Guha Thakurtha, S. N. | 16. Dhar, D. C. |

- | | |
|-----------------------|--------------------------|
| 17. Das, N. G. | 26. Ghosh, S. |
| 18. Dey, K. B. | 27. Khastagir, P. B., |
| 19. Das, G. C. | 28. Tshring, S. |
| 20. Pathak, P. C. | 29. Navj, M. I. |
| 21. Singh Kaviraj, D. | 30. Das, U. C. |
| 22. Thumb, S. C. | 31. Deb, B. B. |
| 23. Nag, P. C. | 32. Barkakati, B. P. |
| 24. Pillai, R. R. | 33. Dutta, B. C. |
| 25. Chettri, R. S. | 34. Guru Singh, D. C. S. |

In class-B 31 students have passed.

In class-A 41 students have passed.

Correspondence

We have received the following letters passed between Mr. A. C. Bullmore and Dr. T. A. Turkhud, regarding the "Poultry Disease" prevailing in the presidency at present, and they will be found very interesting. (Ed. I.V.J.)

To

DR. T. A. TURKHU, M.B.C.M., (Edin),
Kodaikanal.

Dear Dr. Turkhud,

I have read with great interest in the "Madras Mail" of the 29th December, an article appearing by Mr. D. Spencer Hatch regarding this new disease which has played havoc amongst Poultry in all parts of India. He mentions in his articles that you have written a very learned and valuable paper from research which would be made public shortly. Now, I write to ask you for any information which you have gathered regarding "Tick fever" amongst poultry and also the "Ranikhet disease" amongst poultry, their symptoms, treatment and prevention. I have had several cases of same brought to my notice, and as a rule they have ended fatally. Any advice on the subject will be gladly appreciated.

Thanking you for an early reply and wishing you the compliments of the season.

MADRAS,
4th January, 1931.

Yours sincerely,

A. C. BULLMORE, J.P

Dear Mr. Bullmore,

With reference to your letter of the 4th instant, it is very kind of you to refer to me about the information you need, but I am really no authority on poultry diseases, although since the introduction of plague into this country, I have been greatly interested in the diseases of animals, especially as so many of them appear to be communicable to mankind.

As regards the commonly prevailing epizootics among the poultry, the following three are met with in India. The names however, by which they are generally known, convey a very inaccurate idea as to their nature:—

1. Fowl Cholera.
2. Fowl Typhoid.
3. Ranikhet Disease.

1. Fowl Cholera is of the nature of human plague and not cholera. The germ, which is similar in appearance to that of bubonic plague, is met with in peripheral blood as well as in internal organs. It is an organism of the hæmorrhagic septicæmia group and has nothing in common with the germ of human cholera, the latter being found only in the gastro-intestinal canal, and not in the circulating blood. The organism of the bubonic plague is conveyed through the bite of the rat-flea, and it is very likely that the organism of "fowl cholera" may be transmitted through the bite of some biting insect, probably the fowl flea or the fowl-louse. This disease can be easily diagnosed by means of blood smears, and readily prevented by injecting chickens with anti fowl-cholera vaccine as soon as the presence of the disease is correctly diagnosed. This vaccine may be had from the Veterinary Research Institute at Muktesar.

2. Fowl Typhoid:—This disease has lately been found to exist in India also. The symptoms are similar to those in "Fowl Cholera", but "Fowl Typhoid" generally attacks the younger birds, while the old ones seem to escape. The organism resembles the germ of the human Paratyphoid Fever, (rather than the germ of Typhoid Fever,) and allied organisms which are connected with the causation of "food poisoning" in man. Other organisms of the same group, viz.

"Danysz bacillus", and "Bacillus typhi murium", form the active ingredients of certain commercial rat-poisons, such as "The Liverpool Rat Virus" and "The Danysz Rat Poison:" but these have been occasionally found to be dangerous to man also.

The organism of Fowl Typhoid, *Salmonella gallinarum*, vel *pullorum*, was, it appears, the organism first described by Nocard, and considered by him to be the cause of Psittacosis or Parrot disease. The infection most probably occurs by the gastro-intestinal channel through food becoming contaminated with infected droppings. A vaccine prepared from the causal organism is now under trial at the Muktesar Institute, and if found successful, will prove useful not only as a preventive, but as a curative also, like the human typhoid vaccine. This disease can be definitely diagnosed only by a skilled bacteriologist by cultural and serological methods.

3. A third disease, which during the past few years has caused such a havoc among fowls in India and other countries, was first accurately described by Doyle in England, who called it "Newcastle Disease". It has been carefully studied by Cooper at Muktesar, and tentatively named in India as "Ranikhet Disease". It is caused by an ultra-microscopic organism which cannot be seen even with the highest powers of the microscope; but its existence and its ability to pass through the pores of very fine filters, can be definitely proved by laboratory methods. In addition to poultry, it is found to attack crows, but the kites and mynas seem to be naturally immune; at least so I found in Kodaikanal. Psittacosis, which during the past few years has caused such a heavy mortality amongst parrots and similar birds in South America, U.S.A., England, France and Germany, and which, it has been now conclusively proved, is caused by an ultramicroscopic filtrable virus, is probably akin to this disease, if not identical with it; this however, remains to be proved by means of serological and immunological studies. The infection occurs direct through the mucus from the mouth. With reference to the preventive vaccine recommended by me, the preparation of which is described in Spencer Hatch's paper, I have had no means of trying it on a large scale. Probably, vaccine prepared in a similar manner from the liver of a bird that has

survived after an attack of Ranikhet Disease, may even prove efficacious as a curative. The correct diagnosis of this disease can only be arrived at by definitely excluding "Fowl Cholera" and "Fowl Typhoid" by bacteriological methods.

In your letter you allude to "Tick Fever" among poultry. I do not know if by this you mean the "Spirillum Fever" which is some times met with in fowls. The organism is akin to that of Relapsing or Famine Fever in man, and belongs to a higher group of micro-organisms, viz., Protozoa. I do not know if any special kinds of ticks are found on fowls, but this fever, of "Fowl Spirillosis" as it is called, is more likely to be spread by fowl-lice, similar to the way in which the head-lice convey the infective agent of Relapsing fever from man to man.

As regards the symptoms noticed during these epidemics among fowls, they appear to be more or less similar in all, viz. those of an acute febrile infective condition, and it seems to me that it will not be possible to diagnose any of these diseases correctly by simply looking at the signs and symptoms seen among the affected birds. The correct diagnosis can only be arrived at with the help of blood smears and a thorough post-mortem examination carried out by bacteriological methods and with serological tests.

Prevention:—The spread of "Fowl Cholera" can be most effectually prevented by inoculating all birds with the anti vaccine; two doses are generally given after a week's interval, and the immunity conferred lasts about 8 to 10 months to a year. Preventive vaccines against "Fowl Typhoid" and "Ranikhet Disease" are still under experiment. In all these diseases, it should be remembered that the infection is invariably brought in originally from outside; therefore every precautionary measure must be most rigidly taken to see that this does not happen.

Treatment:—"Prevention is better than cure" should be the maxim for every poultry farm. When the infection has already occurred and the birds have commenced to die, small doses of Iodine along with stimulants may be tried; they may prove useful in "Fowl Cholera" and "Fowl Typhoid." Cases of Spirillosis can be readily cured by intravenous injections of arsenical compounds. Finally, as so many of the

infectious diseases are now known to be conveyed by fleas, lice, and other insects, mites, biting flies, and ticks, every care should be taken to see that the poultry runs and the birds themselves are free from such parasites.

I trust the above information may prove of some use to you. In the case of any epidemic breaking out in your farm, I should strongly advise you to send the sick or dead birds immediately to the Veterinary Hospital, Madras, who I am sure, would be glad to diagnose the disease correctly for you.

"IFFLEY"
Kodaikanal,
8th January, 1931.

Yours sincerely,
D. A. TURKHUDD.

Reviews.

A Hand Book for Veterinary Surgeons.—By Fred Bullock, LL. D. Barrister-at-Law, with Preface by Sir John M'Fadyean, LL.D., B. Sc., M.B., M.R.C.V.S. 2nd Edition. pp. 190. Price 5s. Net. Publishers. Messrs. Bailliere, Tindal & Cox, 7 & 8, Henrietta Street, Covent Garden London:

This handbook by Dr. Bullock is primarily intended for Veterinary Surgeons practising in Great Britain and Ireland and is a handy book containing a mine of information pertaining to the profession. Going through the book, one practising in India will be struck with the enormous responsibilities and duties of the veterinary surgeons in that country conferred by the Statute and also the extent to which his actions are scrutinised and controlled by the R.C.V.S.

The law concerning negligence is rather exacting and gives an opportunity for a litigious client to annoy the practising Veterinary Surgeon by dragging him to court of law on very puerile grounds. In one way, this puts the Veterinary Surgeon on his mettle and makes him very cautious and careful in his practice.

There is one chapter in the book which is of universal application and must be of immense guide to practitioners young and old: and that is the chapter on "Professional Conduct." In a country like ours, where the profession is still in its infancy and where the private practitioners are scarce, keen competition to secure cases does not exist; but even then, it is essential that every Veterinary Surgeon must know what his "responsibilities and duties to his fellow members and to the public" are. As Sir John M'Fadyean says in the preface, "Knowledge with regard to these is not intensive nor is it usually communicated to students in the class room or in the text books and ignorance of them is dangerous because it may mar what would otherwise be a successful career. It is in that regard that the

wise counsel given in this work will prove of inestimable advantage to the younger member" not only in England but all over the world.

"Kennel Building and Plans" and "Principles of Dog Breeding." By Will Judy.

We have received two books, one on the **"Kennel Building And Plans"** and one on the **"Principles of Dog Breeding"** by Mr. Will Judy, published by the Judy Publishing Co. Chicago.

The book on **"Kennel Building and Plans"** deals quite thoroughly with the principles of that art in an easy style of language which can be easily understood by a dog lover, who is not versed in the intricacies and terminology in engineering. The chapters X and XI which deal with the **"Layout for the Interior of Kennel House"** and the **"Layout of the Individual Stall"** are very important, particularly the need of bedding to dogs. **Price one dollar.**

Regarding the book on **"Principles of Dog Breeding"** we feel pleased to say that it has been dealt with excellently. Every sentence is important and instructive. The theories of breeding have been explained succinctly. We have no hesitation in recommending these two books to the Dog Lovers and also to the Veterinary Practitioners, who are sure, will have the happy surprise to find so much in them for the small cost in adding them to their library. **Price two dollars.**

Annual Report of C. V. D., Punjab for 1929-30.

It has always been a pleasure to review the report of the Punjab and the report on hand is no exception.

This is the first independent report issued after its separation from the Agricultural Department and "the air of confidence" noticed after its independent existence last year, has been very well justified. "The improvement of the stock both for draught and milk purposes and the control and cure of disease" are the definite item of programme aimed at by this Department and we cannot reasonably ask for anything better. These must be the legitimate activities of any Veterinary Department and, to those of our members who preach that the improvement of live-stock should be in hands other than the Veterinary Department, we would make a present of the excellent achievement of the work done in that direction by the Punjab Civil Veterinary Department.

The improvement of local breeds by selection has been great and the experiments in fodder crops have been productive of very good results.

The College is second to none in the East and teaches the highest standard of education available in India, and it is a great pity that the Research section has received a set back owing to financial stringency.

The deadly diseases rinderpest and H. S., have been the causes of increased mortality and it is regrettable that a definitely organised campaign against rinderpest has not been started.

Still, we agree with the Hon'ble Minister "that no one will be able to read the report without appreciating the skill, knowledge and enthusiasm,

which are brought to bear on the problems of animal husbandry in the province".

Annual Report of C.V.D., Mysore for 1929-30.

After five years of continued intensive campaign against Rinderpest by S.S. inoculation, there has been a noticeable reduction in the mortality of cattle from this disease: As the Director of Agriculture, Dr. L.C. Coleman, opines, "this low mortality might also in part be due to a natural periodic depression in the severity of Rinderpest epidemics but it is gratifying to note that cattle protected even more than three years previously have remained immune and healthy in the midst of a natural outbreak of the disease, serving as a beacon light of the efficiency of the S.S. inoculation beyond a doubt." This is a very good achievement indeed and we heartily congratulate the Department on the success of its untiring and ceaseless efforts.

The activities of this department and its usefulness is being appreciated by the public and we are glad to note that private gentlemen have come forward with donations for opening out new institutions. It is therefore very unfortunate that the Government have not improved the pay of the subordinates. The Superintendent complains as follows:—"There is also much discontent among the lower subordinates owing to their pay not being improved. Great trouble is taken to train these men, but as they become useful assistants to Inspectors, they resign their appointments to better themselves. The result is that untrained and inexperienced men are continually being taken on to the detriment of the work of the Department." We noticed a similar complaint even last year and we do hope that in the interests of efficiency the Government will take early steps to remove the discontent of their hard working subordinates.

Annual Report of C.V.D., Central Provinces and Berar for 1929-30.

"The outstanding feature of the year 1929-30 was the very heavy mortality among cattle from contagious diseases. The number of outbreaks and deaths has increased every year for the past four years. Last year it was thought that the periodical rise in the incidence of Rinderpest had reached its highest point; it is, therefore, disappointing to read that the mortality from this disease in the year under report was more than double that of the year 1928-29." In these words, the Government of the Central Provinces and Berar commence the review of the Civil Veterinary Department of that province. "It is indeed disheartening to hear of the increasing mortality year after year, and, although we are consoled that this was not due to any deficiency on the part of the Department, still we are of opinion that the continued shortage of staff has not been conducive towards the effective combating of the outbreaks." We are therefore, glad that the Government have awarded as many as 22 scholarships for training of students at the Bombay Veterinary College and two scholarships for two State scholars to study in England,

Preventive inoculation by 'Serum alone' method on a large scale and by S.S. method on a small scale and Propaganda work by means of Magic Lantern and opening of veterinary stalls at fairs, shows and exhibitions have been carried out vigorously. This direct method of educating the masses combined with the increase of the staff should, in the near future, improve the health of the live-stock and reduce the incidence of contagious diseases.

Annual Report of C. V. D., Madras, for 1929-30.

The report of the Civil Veterinary Department, Madras, for 1929-30, which has been published is quite an impressive record. Stagnation and procrastination are writ large in the pages of the report; and "carry on" instead of "push on", appears to be the prevailing policy in this still infant department.

The mortality from contagious diseases, which are really preventable is still very high and, as usual, Rinderpest claims the heaviest toll. Apart from the inadequacy of staff in some places, insufficiency of Protective Serum and its non-availability in time materially help to perpetuate the continued high mortality, from this disease. While Rome was burning, Nero was fiddling—that appears to be exactly the attitude of the authorities with regard to the combating of this dire disease. Year after year the ravages of this disease are increasing and the poor unfortunate ryots of the country are becoming poorer and poorer by the loss of their cattle from a purely preventable disease: and yet what have the Government done? Have they taken really earnest efforts to stamp out the disease? Have they taken adequate steps to protect the live-stock from getting it? Have they ensured a sufficient supply of Protective Serum to immunize the cattle against it? This latest annual report of the Veterinary Department is only a resume of the oft-repeated tale of the failure to do the essential. Many District Veterinary Officers have recorded that more preventive inoculation could not be done for want of the timely supply of sufficient quantities of Serum. Why is this? Is it not a fact that Muktesar the sole source of supply of serum for this province could not meet the demand? If so, what steps have the Government taken to supplement the supply?

The opening of a Serum Institute for this Province was said to be a *fait accompli* about two years ago but, for some mysterious reasons, it is still under the consideration of the Government. We wonder what those reasons are! Whatever they may be, we can assure the Government that if the cattle mortality continues at this rate for a few years more there will be only the survival of the fittest and then there would not be any need for an opening of a Serum Institute. A good prospect, indeed!

During the year under report, there has been a change in the policy of free treatment of patients at the Hospitals. In recognised and well established Hospitals, a "fees-system" has been introduced, we are glad to note, with good results. The attendance has not been materially affected in these institutions while at the same time there has been an increase under "receipts" for the Department.

As remarked last year, we wish the plates had been printed with care and attention to detail. We would draw attention to Plate No. 5 to illustrate what we mean.

We wish plate No. 4 had not been inserted at all. A view of a first class Cattle Fair, with a miserable looking specimen in the fore-ground and without any view of any other animals, is not a view at all,

Annual report of C. V. D., Bihar & Orissa, for 1929-30.

The report is a record of fairly good progress in spite of financial difficulties and paucity of staff. The Patna Veterinary College was opened on 1st July 1930, and as a preliminary measure the Principal and some of his staff were recruited early so as to enable them to get themselves accustomed to the work.

As in various other provinces in India, contagious diseases especially Rinderpest continue to levy a heavy toll and, in some parts of the province, the mortality has been alarmingly severe. Preventive inoculation by 'Serum alone' method is being pushed in general but owing to the "dyarchy" prevailing in the administration, some of the local bodies find it difficult to supply the protective serum in adequate quantities. We have more than once remarked that unitary control is the best method of running an infant department like the Veterinary Department, and we wish that this suggestion is considered by the powers-that-be.

The breeding operations in this province are also under dual control: the Patna Cattle Breeding and Dairy Farm is under the Veterinary Department, while in the rest of the province, it is under the Agricultural Department. This is not satisfactory, from the point of view of efficiency and progress and we wish that, as in the Punjab, the whole of the breeding operation is under the management of the Veterinary Department.

Annual Report of C. V. D., Bombay, for 1929-30.

There is nothing very striking in this report as owing to financial difficulties, the Government have been unable to expand the activities of the Department, which admittedly is very important. Even the improvement of the Veterinary College laboratory could not be undertaken for the same reason. We are very sorry for this stagnation because the improvement of live-stock of the country is a great national asset calculated to improve the wealth of the country.

Rinderpest, Foot and Mouth and H. S., have all been prevalent and have been causing a great loss to the agricultural masses. Preventive inoculations have been freely carried out owing to the abolition of the fees.

We are glad to note that "the treatment of Surra by means of intravenous injection of Bayer 205 was further tried with success".

ERRATA.

Vol. VII, No. 3.

The photograph on page 266 of this Journal was inadvertently printed here instead of on page 264. It refers to the article on Osteoporosis in a Pony and represents the Sub-maxillary bone of the animal, as mentioned in the last paragraph of that article.

We are thankful to the Madras Agricultural Journal for the loan of the block of the photograph of late Mr. A. M. Richards published after page 222.



DR. PANGAL'S VETERINARY INSTITUTE.

26, Wallajah Road, Mount Road, Madras
A FEW OF DR. PANGAL'S AND OTHER
SPECIALITIES.

To all Lovers of Horses, Cattle and Dogs.

1. Equitone.—A well-tried and the only genuine tonic powder for horses. Quite indispensable to horse-owners to keep their animals healthy, active and in tip-top condition. This creates good appetite, expels all worms from the stomach and improves the coat wonderfully.

Price per 2 lbs. Tin Rs. 3-12-0

1 lb. Tin Rs. 2.

2. Dhum-Dhum.—A specific for dhum i.e., heavy breathing so common in horses. Acts like magic.

Price per 2 lbs. Bottle Rs. 4.

1 lb. Bottle Rs. 2.

3. Hoof Ointment.—This strengthens the hoof and is a specific for brittleness.

4. Cough Electuary.—A specific for cough and catarrh in Horses. Works wonderfully

Price per 1 lb. Tin Rs. 4.

5. Embrocation.—A specific for all kinds of sprains, thickened tendons, cold, catarrh etc., in horses, dogs and cattle.

Price per Small Bottle Re. 1-4-0.

Big Bottle Rs. 2.

6. Electric Mange Cure.—An excellent remedy for all kinds of mange, and is a specific for follicular mange in conjunction with Aricyl injections. Acts like magic.

Price per Bottle Rs. 2.

7. Pulvex (Tick Specific).—A wonderful tick destroyer.

Price per Bottle Re. 1-4-0.

8. Canogen.—An excellent Pick-me-up for dogs.

Price per Bottle Re. 1-8-0.

9. Bovotone.—Best tonic powder for cattle and growing calves and is a good lactagogue. This improves the appetite, and general condition of the animal. Fattens the cow, sweetens its milk, and at the same time increases the yield of rich and creamy milk.

Price per 4 lbs. Tin Rs. 3-8-0. 2 lbs. Tin Re. 1-12-0.

10. Painokil.—A specific for all inflammatory swellings, fibrous growths on the neck of the bulls, capped elbow, hock etc.

Price per Bottle Rs. 2.

11. Curolilq.—Acts very wonderfully in drying up all cuts, wounds and sores.

Price per Bottle Rs. 2.

12. Specific for Fowl-Pest or Ranikhet Disease.—Acts wonderfully well.

Price per 8 oz. Bottle Rs. 3. 4 oz. Bottle Rs. 2.

13. Aricyl.—An arsenic injection, a specific for follicular mange in dogs.

Price per box of 10 ampoules Rs. 2-8-0.

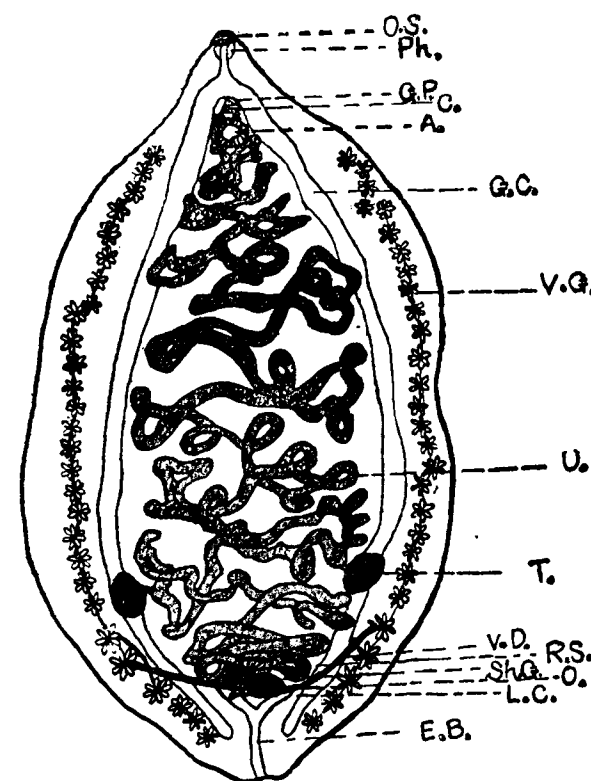
14. Eozemine.—A best remedy for eosema in dogs;

Price per 8 oz. Bottle Re. 1-4-0. 1 lb. Bottle Rs. 2-8-0.

15. Dr. Pangal's Pain Balm.—A wonderful specific for all kinds of pains and sprains

Price Rs. 8 a Bottle.

PLATE I.



A Diagrammatic sketch traced out from a photograph of the whole mount, with necessary insertions of details not possible to obtain clearly in a photograph of a thick specimen, Mag. X, 14.

A. acetabulum; C. cirrus; E. B. excretory bladder G. C. gut caeca; O. S. oral sucker; Ph. Pharynx; R. S. Receptaculum seminis; Sh. G. shell gland; T. testes; U. uterus; V. D. vitelline duct; V. G. vitelline glands.

[This plate is to face Page No 232 3rd issue, Vol VII. and refers to the article by Mr. V. R. Phadke 'A new fluke found in the Indian House crow'.]

We are thankful to the "Imperial Council of Agricultural Research," for kindly lending the block.

THE HOLBORN VETERINARY INSTRUMENTS



Stock Knife, Castrating Milk Fever Outfit.
Sheep foot, Skinning With Double Bellows
Blades. complete,
Rs. 4 post free. Rs. 6-8 post free.

THE HOLBORN BLOODLESS CASTRATOR.



Large size for Bulls, Horses, &c.,
13 in. Rs. 33. 17 in. Rs. 37.
Medium size for Rams, Calves, &c.,
11½ in. Rs. 32.
Small size for young Lambs, 8½ in. Rs. 19.
Post free.

By using this instrument the Spermatic Cord
is crushed without cutting the bag and the
testicles dry up. Risk of infection is entirely
avoided. Thousands of these instruments are
in use-Testimonials received from all quar-
ters. Pamphlets post free.

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