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Editor :

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NOTICE

The Indian Veterinary Journal

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EDITOR :

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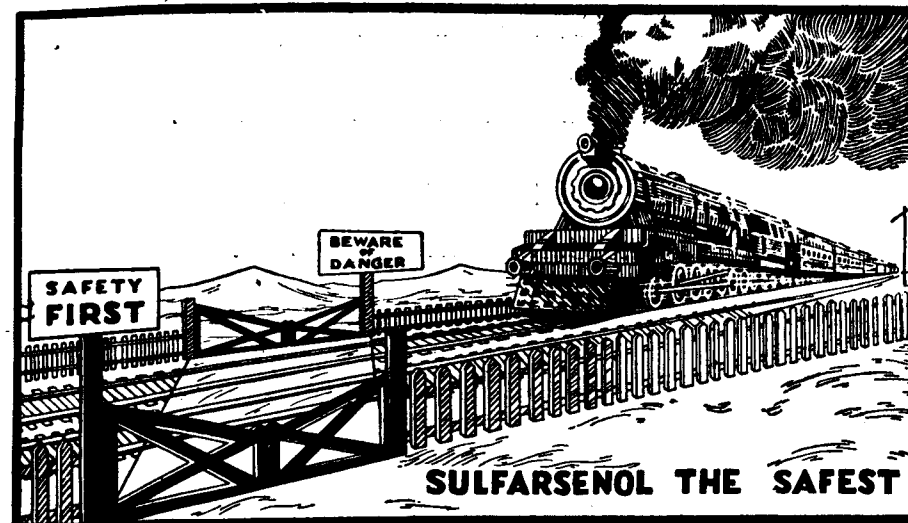
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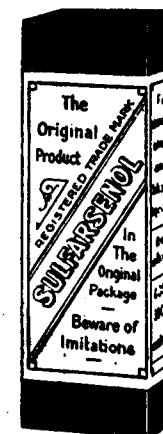
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(The Journal of the All-India Veterinary Association)

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APRIL, 1932.

[No. 4.

CONTENTS

	394	PAGE
I. EDITORIALS.		
THE PROFESSION FEELS DEVELOPMENT INDEED	...	235
STARVATION OF VETERINARY SERVICES	...	236
YET ANOTHER	...	238
II. ORIGINAL ARTICLES.		
A SCHEME FOR THE STUDY OF THE NEOPLASMATA.—By D. C. Matheson, F.R.C.V.S., D.V.S.M., (Vict.) Edinburgh.	...	239
FILARIASIS IN DOGS.—By P. Panda, G.B.V.C., Patna.	...	241
HETEROPHYES SPECIES FROM DOGS IN MADRAS.—By M. Anant Narayan Rao, G.M.V.C., and L. S. Parameswara Ayyar, G.M.V.C., Madras.	...	251
DISCUSSION OF A FEW FILTERABLE VIRUSES INTERESTING TO THE VETERINARIAN.—By Dr. C.V. Natarajan, B. Sc., M.B.B.S., D.P.H., Bangalore.	...	253
THE SERUM VIRUS ANTI-RINDERPEST INOCULATION AND ITS DURATION OF IMMUNITY IN THE FIELD.—By J. D. Sampath Kumaran, L.V.P., Mysore.	...	257
A SIMPLIFIED METHOD OF ADMINISTERING THE ANTI-RINDERPEST SERUM-SIMULTANEOUS INOCULATION.—By J. D. Sampath Kumaran, L.V.P., Mysore.	...	258
SOME OBSERVATIONS ON CANINE TYPHUS.—By W. V. Soman, G.B.V.C., Jaora State.	...	260
III. CLINICAL ARTICLES.		
RUPTURE OF BLADDER IN A BULL.—By K. B. Nair, G.B.V.C., Parel, Bombay.	...	262
DRACUNCULUS MEDINENSIS (GUINEA-WORM) IN VETERINARY PRACTICE.—By Mati Lal Ghosal G.B.V.C., Bikaner State.	...	264
RUPTURE OF DUODENUM IN HORSE.—By Abdul Majid Siddiqi, G.B.V.C., Sind.	...	265
SKIN GRAFT TO A WOUND.—By K. S. Prakasa Rao, G.M.V.C., Madras.	...	266
NYCTALOPIA IN A BULLOCK.—By M. Lakshmana Raju, G.M.V.C., Madras.	...	268
URINARY CALCULUS IN A BULLOCK.—By V. K. Chatuphale, G.B.V.C., Bombay.	...	269
PROTRACTED LABOUR.—By J. C. David, G.M.V.C., Madras.	...	271
IV. CULLED FROM ARTICLES RECEIVED FOR PUBLICATION AND FROM OTHER JOURNALS.		
HYDROTHORAX IN BUFFALOES.—By M. D. Vaishnava, G.B.V.C., Bombay.	...	272
PRESCRIPTIONS.—By G. R. Khan, G.B.V.C., Sikandarabad.	...	272
FOREIGN BODY IN THE HOOF OF A PONY.—By Nanak Chand, C.P.V.C., Punjab.	...	272

CONTENTS

	PAGE
NORMAL SALINE SOLUTION IN VETERINARY PRACTICE.—By G. V. Dadhe, G.B.V.C., Poona, Bombay.	273
CONTROL OF HÆMORRHAGE AFTER DEHORNING.—From Veterinary Medicine.	273
STRANGULATED HERNIA IN A STALLION.—From Veterinary Medicine.	274
THE TREATMENT OF OPEN JOINT.—From Veterinary Record.	274
NEW PARASITE OF THE CAT.—From the Veterinary Medicine	275
TURPENTINE INJECTIONS FOR MASTITIS.—From the Veterinary Medicine	275
AVIAN TUBERCULOSIS IN A DEER.—From Veterinary Medicine.	276
ATYPICAL CASE OF DISTEMPER.—From Veterinary Medicine.	277
V. NOTICES OF DRUGS.	278
SULFARSENOL IN THE TREATMENT OF PIROPLASMOSIS.	282
PERNOCTON NARCOSIS FOR DOGS.	285
VI. NOTES.	285
VII. ASSOCIATION NEWS.	
REPORT OF THE ANNUAL GENERAL MEETING OF THE BOMBAY VETERINARY GRADUATES' ASSOCIATION.	289
VIII. COLLEGE NEWS.	
MADRAS VETERINARY COLLEGE EXAMINATION RESULT.	291
BENGAL VETERINARY COLLEGE EXAMINATION RESULT.	292
IX. CORRESPONDENCE.	295
X. EXTRACTS.	
STARVATION OF THE VETERINARY SERVICES.—By S. G. Nawathe, B.A., Poona, Bombay.	297
THE OCCURRENCE OF BOT-FLY LARVÆ (GASTROPHILUS VETERINUS) IN SUBCUTANEOUS TISSUES OF THE HORSE.—By I. Clunies Ross, Sydney, Australia.	300
EVOLUTION: THE POSSIBLE INFLUENCE OF NUTRITION.—By J. A. Gilruth, Sydney, Australia.	301
THE MINERAL REQUIREMENTS OF DAIRY CATTLE.—From the Madras Agricultural Journal.	305
PROCEEDINGS OF THE LEGISLATIVE COUNCIL OF THE GOVERNOR OF MADRAS.	306
XI. REVIEWS.	
VETERINARY OBSTETRICS.—By W. L. Williams, Professor Emeritus, New York State Veterinary College.	
ANNUAL REPORTS OF THE BOMBAY VETERINARY COLLEGE, BOMBAY CITY AND HARBOUR VETERINARY DEPARTMENT AND CIVIL VETERINARY DEPARTMENT IN THE BOMBAY PRESIDENCY, FOR 1930-31.	
ANNUAL REPORT OF C.V.D., CENTRAL PROVINCES AND BERAR, FOR 1930-31.	
ANNUAL REPORT OF C.V.D., UNITED PROVINCES, FOR 1930-31.	
ANNUAL REPORT OF C.V.D., MYSORE, FOR 1930-31.	
ANNUAL REPORT OF C.V.D., BURMA, FOR 1930-31.	

THE Indian Veterinary Journal

Vol. VIII]

APRIL, 1932.

[No. 4

Editorials.

THE PROFESSION FEELS.

I can but trust that good shall fall
At last—far off—at last, to all,
And every winter change to spring.

TENNYSON.

We could only remind our readers of the above words of cheer and hope of Tennyson, in their present depressing conditions. Our office has been flooded with queries, suggestions and mostly with tales of woe and misery, as a result of the merciless application of the "Axe" on what is admitted on all hands as an "Infant" department of Veterinary Services. Some accuse the heads of departments as lacking in courage to put up their case as strongly as possible. The utmost we could say on it, with the information at our disposal is, that perhaps it is only a half-truth. But we have to be cautious of half-truths as some one has said. It may be we are in possession of the wrong half! To be fair, we know of instances where everything possible has been done to represent the view point of the profession. But infant or no-infant, the great giant "Retrenchment" must have his pound of flesh!

The cry of the young unemployed men is harassing. It bleeds our heart to go through some of their letters. We ask them to ponder over the above words of the great poet and hearten themselves. We request the heads of departments to remember their case every day and do the needful at the earliest opportunity.

DEVELOPMENT INDEED!

We learn on good authority that the proposals of the Retrenchment Committee in Madras are extremely drastic and if the Government accedes to such proposals where the Veterinary Department is concerned, the harm done will be incalculable. The Government will prove false to all its past obligations and the word "development" as applied to the Veterinary Department will be more a myth than a reality. Let us get down to a few concrete facts.

Originally a few of the premier Veterinary Hospitals in the presidency, such as Trichinopoly, Coimbatore, Vellore etc., were started and run by the concerned District Boards. More hospitals were opened on the same line, but due to limited finances of such Local Bodies, the Government considered that the development of such useful institutions suffered a good deal and decided to take up the management of such hospitals under their direct control, which they did in 1917. (We quote from our memory). It was a very wise decision of a paternal Government which tried to place the interest of the ryot before anything else. But now it is said, the proposal is to hand over all Veterinary Hospitals to Local Bodies and the Government is to concern itself only with the control of epidemics! However nice and reasonable it may appear to be on paper, we know from past experience that it does not work well in practice. Our friends in Bengal, Bombay and United Provinces where such a system is, we believe, still in vogue will bear witness to our statement. It is one of the main causes for non-development of the Veterinary Department particularly in Bengal and United Provinces. In the very presidency of Madras even the medical institutions at Taluk Head-quarters have been taken off the hands of Local Bodies. To revive a system which was tried sufficiently long and given up as detrimental to the interests of all concerned, is to say the least, highly questionable and suspicious. Again look at the time when it is proposed to effect this change! When such Local Bodies were considered as not solvent enough in normal times to manage Veterinary institutions, how comes it then that a time of admitted bankruptcy is proposed to be chosen for such a change? We cannot believe that the head of the department would countenance such a proposal. If he does, he will be driving the first nail in the coffin of the Veterinary Department. We know these Local Bodies and their Party Politics. We do not want to say more lest we should be invited into the sacred precincts of a Civil Court to take our trial for damages! The present system is the best and if the Veterinary Department is popular to-day, not a little of it is due to the efficient working of such hospitals.

Next the question of supervision is an important one. The recent Royal Commission on Agriculture fully well appreciated this and proposed that there ought to be a District Veterinary Officer for each district, just like District Medical Officers in the Medical Department. The cadre of Veterinary Inspectors was also abolished by the Government in 1923, and where 25 men (19 Inspectors + 4 Deputy Superintendents + 2 Superintendents) were supervising the work of 172 assistants then, the same supervising work with added responsibilities and 265 assistants to manage is now entrusted to 14 officers including the Director! And yet there are people to think that further retrenchment is possible. Surely it is possible with the stroke of a pen; but will it be conducive to efficient administration? If it is thought that the cheaper agency of Veterinary Inspectors can be revived and the number of Circle Officers reduced, we admit that such a proposal may look quite reasonable in the eyes of laymen. But those in the know of things will abhor such a proposal. In the first place recent advances in science have made it incumbent on these supervising staff to conduct field investigation of diseases peculiar to different localities, research work on however modest a scale with well-equipped field laboratory, to direct and co-ordinate the departmental work to the best interests of the ryots, besides being an inspecting machinery of a certain standard of strictness and efficiency. All the above facts are made possible because of their present status. A cheaper agency will bring with it its attendant evils. It will be worse than no agency at all. With penury gnawing the very portals of their heart, with a feeling of being treated unjustly by the Government, with a sense of inferiority when compared with officers of other departments, any attempt at higher standard of professional work will lack in sincerity, earnestness and zeal. All the good work so far achieved will come down like a house built of a pack of cards.

If anything, we want more Circle Officers, so that their jurisdiction may be on a reasonable scale and thus permit them to devote more time for professional work. These officers are men of experience who mostly rise from the lowest rung of the official ladder and with Post-Graduate training. To offer such men anything less than what they now receive would be very unfair. The present constitution is the best and what is wanted is more men in every section of the Service. Let Government do it boldly and we assure them that they will be conferring a boon on rural India and the best opinion of the land will be on their side.

Take again the touring staff, we ask the Government if they are justified in permitting such qualified labour to go to waste when the demand from the land is so great. One Honourable Member of the Legislative Council struck the right note during last budget session

when he said 'The stipends paid to them and the experience they had gained these several years would be lost to the province'. The Government admit every time they are questioned that the staff is inadequate, but yet they seem to be unwilling to pursue the only course open to them—to entertain all men available. We are unable to understand the purpose of such an attitude. Is this development? We plead our inability to answer.

We reserve our remarks on the question of Veterinary Education and transference of Live-stock section to the Veterinary Department to another article. In the meanwhile we request the Madras Government to pay their best attention to the whole question.

"STARVATION OF VETERINARY SERVICES"

Under the above expressive caption we have received a printed pamphlet, which has evidently been widely circulated, for publication in our journal. We gladly do so in this issue and offer our thanks to the writer Mr. S. G. Nawathe, B.A., for the interest he has been taking in our profession.

Mr. Nawathe is a student of cattle economics and is well known in his native presidency of Bombay. His interest in the subject made him pay a hurried visit sometime back to places like Bangalore, Rayanakere, Kunigal and Hosur Cattle Farm in the presidency of Madras to study at first hand the various attempts made in those centres, to improve the Live-stock of that presidency. He impressed all those with whom he came in contact, as a person who has taken lot of pains to study the subject of his choice and has bestowed considerable thought over it. Coming as it does from such a well-informed gentleman, we hope the article will receive the attention it deserves at the hands of the Government. "On no grounds of economy should it be deemed necessary and wholesome to close the dispensaries", to raise the medical fees, to dispense with the doctors and so forth," says Mr. Nawathe. He further adds "There ought to be many improvements in the department, if it is to be of any real use to the villagers. This being the case, to cut down the expenditure of the department on the ground of *national* economy is sheer injustice, to term it mildly." (*Italics are ours*). We could see the heart that feels for the poor Indian ryot in the above lines! We appeal for sympathetic consideration at the hands of the Powers-that-be. We could only turn our eyes heavenwards and shed tears of helplessness! For, man seems to be determined not to see through the injustice of it all.

We commend the article to our readers.

YET ANOTHER.

Mr. Ram Lal Kaura, L.V.P., Veterinary Assistant Surgeon, Punjab, has left for Canada and has joined the Final Year B.V.Sc., class at the Ontario Veterinary College, Guelph. He passed out of the Punjab College in 1928, and later had training for some time at the Imperial Institute of Research, Muktesar. It is learnt that after taking the B.V.Sc., degree of Canada, Mr. Kaura intends to proceed to England to take the M.R.C.V.S., course. We wish Mr. Kaura every success.

Original Articles

A SCHEME FOR THE STUDY OF THE NEOPLASMATA.

BY

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

Professor of Pathology and Bacteriology, Royal (Dick.) Veterinary College, Edinburgh.

In recent issues of the Indian Veterinary Journal the present writer (Matheson¹) has set forth a series of questions designed to assist the student of the subjects indicated in the arrangement of his notes, abstracts from current periodicals etc. In that connection we may here add one question to the series under the heading of "Pathology" (*Indian Veterinary Journal Vol. 8, p. 194*) and after the question there asked "*What is this condition*" we may add "*How is it caused*"? In the present article there is set forth a series of questions designed for application to the study of the Blastomata and of the Teratomata. The questions explain themselves but have two applications at least:—

- (1) We may arrange available information upon a tumour e.g. a Fibroma as answers to the questions.
- (2) If we wish to publish an account of a tumour found at post-mortem or at other examination we shall find the questions afford us a guide to an orderly and relatively complete presentation of our observations to which, of course, can be added any other detail of importance not specifically provided for in the questions.
 - (i) What is—e.g. a Fibroma?
Definition:
 - (ii) Where is it found?
Sites.

- (3) How may it be recognised?
- (a) Macroscopical Characters:
 Outline: Size: Shape: Colour: Consistence:
 Cut surface (appearance of). Weight: Relation to
 surrounding tissue or tissues etc.
- (b) Microscopical Characters:
 Type of cell: Uniform: Diverse: Contents:
 Nucleus: Mitotic figures? Evidence of malignancy?
 Polymorphism? Intercellular material. Signs of
 degeneration: Relation to surrounding tissues:
 Stroma, present? Scanty? Abundant? Proportion
 to cells.
 Blood Vessels: Primitive or well formed: numerous
 or scanty in number? Lymph Vessels? Any trace
 of nerves?
- (4) Secondary Growths:
 Situation or Situations.
 Evidence of methods and tracts by which the neo-
 plasm spread, e.g. by permeation; by way of the
 blood stream, by the lymphatic system, etc.
- (5) What are its effects upon the body?
 Clinical Characters: Malignant? Benign?
- (6) What are its effects upon the organ or tissue in which it
 occurs?
 Local effect: Pressure atrophy etc. Infiltration: etc.
- (7) What changes may it undergo?
 Degeneration? etc.
- (8) In which animals does it more commonly occur?
- (9) What is known with regard to the causation of such a
 growth?

REFERENCE.

MATHESON D. C. (1932). A Scheme for the Study of Pathology and of Bacteriology. *Ind. Vet. Jour.* Vol. 8 p. 194.

FILARIASIS IN DOGS.

BY

P. PANDA, G.B.V.C.,

Research Laboratory, Bihar and Orissa Veterinary College, Patna.

I believe this disease has not hitherto been studied by the Veterinarians as far as this province is concerned. The object of this paper is to present to the readers a brief account of my study into the Epidemiology, Clinical appearances, Morphological characters, Post-mortem findings, Pathological changes and Experimental treatment of 'Filariasis in Dogs.'

In 1924, I was deputed by the Bihar Government to investigate into animal filariasis at Puri—a notorious place for it—where I worked in collaboration with the late Civil Surgeon there in the Filariasis Research Laboratory attached to the Pilgrim's Hospital. When I was there for about 8 months to study this disease, I got ample opportunities to study this, as well as the Filariasis of the human subject. After our study, we prepared a conjoint paper which was read before the Indian Science Congress, at Benares in 1925. I returned that year to Patna and took up this work again in the Laboratory attached to the Head Office. I am grateful to Mr. Quinlan, the late Director of the Civil Veterinary Department, Bihar and Orissa, for the help he gave me during the investigation into this disease.

Filariasis is a parasitic infection of the system caused by different *Filariae*, some of which may be so injurious as to bring about death eventually.

Periodicity:—No diurnal or nocturnal periodicity could be noticed in these microfilariae.

Incidence:—It was found, by examining blood smears of a fairly large number of dogs, that nearly 10 per cent. showed microfilariae in their blood.

Fixing and staining blood-smears:—The smears were then dried in the air first and then lightly fixed over the flame of a spirit lamp or bunsen burner. They were then flooded with distilled water to dehaemoglobinise them and stained with either 1 per cent. aqueous solution of Methylene blue, Leishman's stain, Giemsa's stain, Bismarck Brown or Haematoxylin. Each stain has its own advantage for studying the different structures, but Giemsa's stain gave the best results.

Observation of Microfilaria in cover glass preparations:—Filarial embryos seen under a 2/3rd objective, look minute snake like refractile organisms wriggling about in the blood. They make a to and fro movement and assume the shape of figure of eight. They push

away the cells and swim about freely in the plasma. When examined under 1/6" lens the embryos show granules inside the cuticle.

Morphological characters:—The Microfilariae in question are larger than those found in equines, bovines or men. The tail end of each tapering like a whip-lash, has a graceful curve. Their movements are so active as to make them go out of the field of the microscope. There is no sheath and no tongue like process thrown out periodically as in *M. bancrofti*.

In stained specimens, the structure of the Microfilaria is very distinct. The arrangement of the cells, presence or absence of the sheath, arrangement of vacuoles, nerve ring, excretory pore, excretory cell, inner granular mass, genital cell, anal pore, etc., come out distinctly.

The average length of eight Microfilariae was found to be 345 μ in length and 6.5 to 7.5 μ in breadth. Their percentage measurements are as follows:—

Korke's (1924) *m. f. lewsi* (n.s) average length 169.86 μ . Rao's (1923) *m. f. recondita grassi* measured 221 to 225 μ . Species of *m. f.* collected by Mitter (1912) in Calcutta and determined by Raillet and Henry as *Dirofilaria repens* measured 460 μ .

Neumann records the following species of Microfilaria from dogs:—

1. <i>Dirofilaria immitis</i>	average length 243.9 μ .
2. <i>Dirofilaria repens</i>	" 300, 360, 375 μ .
3. <i>Dirofilaria ochmani</i>	" 320 μ .
4. <i>Acanthocheilonema recondita</i>	" 216 μ .
5. <i>Acanthocheilonema dracunculoides</i>	" 195 to 230 μ .
6. <i>M. F. aquieri</i>	" 87.7 μ .

From the above it appears that the *m. f.* in question belongs to the species *Dirofilaria repens*. It is not *Dirofilaria ochmani* which is a rare species, moreover they possess a sheath.

Fulleborn says that it is practically impossible to distinguish *m. f. immitis* from those of *repens*. If the Microfilaria, described above were *m. f. immitis* then one should find adult filariae in the cavities of the heart. The filariae in the cases seen here were found in the subcutaneous tissues which is the habitat of *D. repens*. The Microfilariae *repens* have a perstans habit unlike *immitis* which have a nocturnal habit. There is also a difference of about 100 μ in their length.

Viability:—It was observed that a microfilaria in an ordinary cover glass preparation lives approximately 16 hours, but this depends on the quantity of blood taken for the wet preparation. In an

ordinary preparation as soon as the plasma dries up the embryos also die out. A series of cover glass preparations ringed with vaseline were made and kept at both room temperature and in the incubator and it was found that they live approximately from 40 to 46 hours.

In hanging drop preparation they live for about 36 hours. When the microfilariae are kept in a test tube containing serum they live for about 80 hours. In defibrinated blood these embryos can live as long as 110 hours.

Clinical symptoms:—In canine filariasis, no fluctuation in temperature was ever noticed. A dog suffering from filariasis was kept under observation for two and a half months and his temperature was taken twice daily and no variation was noticed. It has been observed that the hair on any one part or parts of the body appears rough, later on slight erythematous skin eruptions appear. The lesions generally spread, later on the parts get bald and the skin lesions look what may be called "weeping eczema". The dog constantly scratches the part and in advanced cases, the pruritus is so intense as to cause it to bite itself till the skin bleeds. Emaciation sets in, in spite of good feeding. Anaemia and leucocytosis is a marked feature. Microscopical examination of scraping from the affected parts does not show any acari. The above symptoms get more pronounced or the affected part may heal, leaving the skin dry and wrinkled. Before the so-called cure occurs on one part of the body, some other parts may show pruritus, &c. This probably is due to the migration of the adult filariae, found in the subcutaneous connective tissues, from one region to the other.

Gradually emaciation gets more and more marked the dog has a haggard appearance, and gets dull and debilitated. Kawakami and Kitagawa recorded a case of elephantoid skin in a dog. This, I think, is the dry and corrugated state of the skin I have referred to above.

Post-mortem appearance:—All internal organs were found to be anaemic. Liver was found enlarged and showed white areas on the surface. The spleen was enlarged, kidneys pale and larger than normal, lungs were congested and in some cases they showed marbled appearances something like pneumonic lungs. Heart muscle was pale and anaemic.

Pathology of the disease:—Literature on canine filariasis is rather meagre. With a view to ascertain the pathological changes in the organism pieces from them were sent to Muktesar, and the report was as follows:—

- (a) A chronic venous congestion of the liver or what may be called a "nutmeg" liver.

(b) A chronic peri-bronchitis and croupous and sometimes catarrhal and even suppurative pneumonia.

(c) A chronic interstitial nephritis.

(d) Brown atrophy of the heart and other minor changes.

Attempts at transmission:—A few experiments were undertaken to find out the mode of transmission of this parasite and some observations were made to see if the microfilariae pass through the placenta to the foetus. The pregnant bitches harbouring microfilariae were kept under observation. The placenta of both the cases were examined in detail and no microfilariae could be detected. The litters obtained from them, 5 pups in one case and 6 in the other, were examined periodically from their birth upto three months, and their blood was found to be free. This proves that the microfilariae cannot pass through the foetal membranes.

A healthy dog with its back shaved over an area of 4 square inches, on both sides, was kept in a mosquito proof room with a large number of laboratory bred mosquitoes (*Culex* and *Anopheles*) let into it. A dog heavily infected with microfilariae was kept inside the room for 5 weeks. The healthy dog failed to contract the disease. Some mosquitoes from the room were caught daily, dissected and examined. Dead microfilariae were found in the stomach and gut of these but none were found in the thorax or proboscis. For want of time at my disposal, I could not conduct further experiments with other biting flies or ticks which may be probable vectors of this disease in dogs.

Rao (1923) showed that the developmental forms of *microfilaria recondita grassi* were found in the *Culex fatigans*.

I carried out a series of experiments to find out if microfilariae could infect directly, a healthy subject and with this idea in view, I fed a dog with 5 c. c. of blood very rich in microfilariae; another dog was given 3 c. c. intravenously and the fourth received the blood by the three channels. In all cases, it failed to infect except in the latter case in which prolonged examination of blood revealed a few larvae upto the 12th day, after which they disappeared. On the 62nd day, this dog was destroyed and the blood of different internal organs was searched for microfilariae, but none was found.

Experimental Treatment:—Bayer 205 or Naganol.

Case No. 1:—Tan pariah bitch—average number of microfilariae 42 to 46 in a drop of blood.

1st day	$\frac{1}{2}$ gr.	in 1 c. c. of N. S. S. intravenously.
2nd "	$\frac{1}{2}$ "	" "
5th "	1 "	" "
6th "	$1\frac{1}{2}$ "	in 2 c. c. "

7th day	3 grs.	in 2 c. c. of N. S. S. intravenously.
8th "	4 "	" "
9th "	4 "	" "
10th "	5 "	" "
11th "	6 "	" "
12th "	8 "	in 3 c. c. "
13th "	10 "	" "
14th "	12 "	" "
15th "	13 "	" "
16th "	15 "	in 5 c. c. "
17th "	The bitch had high thermal reaction and was not feeding.	

18th " The bitch was very dull, emaciated and was completely off her feed. Died at 2 P. M.

P. M. Changes:—General emaciation, muscles pale and anæmic, lymphatic glands enlarged. Liver—icteric, inflamed and friable. Spleen—enlarged. Kidney—enlarged. Mediastinal and lymphatic glands—swollen. Lungs—pale and anæmic. Large number of microfilariae were found in the blood of the internal organs. Naganol had no effect on the *m. f.*

Sodium Antimony Tartarate Treatment:—

Case No. 2:—Black and white pariah dog. Number of microfilariae 44 to 48 in a drop of blood.

1st day	5 c. c. of a 2 per cent. solution was given intravenously.	
2nd "	2'00 c. c. "	
3rd "	2'5 c. c. "	
4th "	3'00 c. c. "	Temperature normal but dull and off feed.
6th "	4'00 c. c. "	Rise in temperature, emaciation, papules over the abdomen were seen as in distemper, completely off feed.

Practically no change in the number of *m. f.*

7th " Very dull and listless, diarrhoea had commenced.

8th " Died. Autopsy showed gastro-enteritis. Internal organs were teeming with living *m. f.* 11 adult filariae were found in the subcutaneous connective tissue.

Sodium Antimony Treatment:—

Case No. 3:—Black and white pariah dog. Number of microfilariae 8 to 10 in a drop of blood.

- 1st day. 10 c.c. of serum extracted from the blood of Case No. 4, 3 c.c. given intravenously, 4 c.c. subcutaneously and 3 c.c. intramuscularly.
- 2nd to 10th „ Under observation. No change in the number of *m. f.*
- 11th „ 6 c.c. of serum was given intravenously, 6 c.c. intramuscularly and 8 c.c. subcutaneously.
- 12th to 25th „ Under daily observation. No change in the number of *m. f.* Discontinued treatment.

Case No. 6:—The above bitch after being given rest for a fortnight, was given a course of Antimony Tartaratum extending over 2 months. Reduction in the number of *m. f.* was observed, but they did not completely disappear.

The bitch gave birth to 5 puppies which did not show *m. f.* in their blood neither did the blood from placenta show any *m. f.*

Formaldehyde Treatment:—

Case No. 7:—Tan and white pariah dog, heavily infected with *m. f.* numbering about 172 *m. f.* in a drop of blood was treated as follows:—

- | | | |
|---------|--|---|
| 1st day | 0.5 c.c. of 0.5 per. cent. solution given intravenously. | |
| 3rd „ | 1.0 c.c. | „ |
| 4th „ | 1.5 c.c. | „ |
| 5th „ | 2.0 c.c. | „ |
| 6th „ | 3.0 c.c. | „ |
| 7th „ | 5.0 c.c. | „ |
- No change in *m. f.*

It was given altogether 13 c.c. of a 0.5 per. cent. solution of Formaldehyde which had no action whatsoever in reducing the number of *m. f.*

Atoxyl Treatment:—

Case No. 8:—Tan and white pariah dog. Number of *m. f.* 212 in a drop of blood.

- | | |
|---------|---|
| 1st day | 1 gr. of Atoxyl in 1 c.c. of water intravenously. |
| 5th „ | 1.5 „ „ 2 c.c. „ |
| 12th „ | 5 „ „ 5 c.c. „ |
| 18th „ | 10 „ „ 5 c.c. „ |
| 25th „ | 16 „ „ 5 c.c. „ |
| 27th „ | Temperature 103.8° F. „ Dull and off feed. |

It died evidently of arsenical poisoning. Small pimples and pustules were found on the abdomen and thighs.

During P. M. examination, 26 adult filariae were found in the subcutaneous connective tissue over the region of the thigh, chest-walls, scapular regions, forelegs and neck. Some were in pairs and some singly varying in length from 3 to 7 inches.

The M. M. of stomach and intestines were found inflamed. Live *m. f.* were present in the different internal organs.

Rivanol Treatment:—

Case No. 9:—Black pariah bitch. Number of *m. f.* 22 to 24 in a drop. This was treated with Rivanol. This drug is a German preparation probably a derivative of aniline dyes and is used in filariasis in the human subject.

- | | |
|---------|--|
| 1st day | 5 c.c. of a 0.1 per. cent. solution intravenously. |
| 2nd „ | 8 c.c. „ „ |
| 3rd „ | 12 c.c. „ „ |
| 4th „ | 15 c.c. „ „ |
| 5th „ | 25 c.c. 0.2 „ |
| 6th „ | 25 c.c. „ „ |
| 7th „ | 25 c.c. „ „ |
| 8th „ | 25 c.c. „ „ |
| 9th „ | 25 c.c. „ „ |

No decrease in the number of *m. f.* and so this was discontinued. This bitch gave birth to 6 puppies. The blood from the placenta did not show *m. f.* Neither the puppies showed any *m. f.* although they were kept for over 2 months under observation.

Hydrargyri Perchloride Treatment:—

Case No. 10:—Tan, black and white dog. Number of *m. f.* 2 to 3 in a drop of blood.

- | | |
|---------|---|
| 1st day | 1 c.c. of 1 per. cent., solution intravenously. |
| 2nd „ | 1 c.c. „ „ |
| 3rd „ | 1.5 c.c. „ „ |
| 4th „ | 2 c.c. „ „ |
| 5th „ | Constant straining. |
| 6th „ | Temperature normal. Symptoms of mercurial poisoning seen. |
| 7th „ | Temperature down to 97°. Morose and moribund. |
| 8th „ | Died at night. |
- An influx of 10 to 12 *m. f.* in a drop.
Off feed. Salivation, vomition of bile stained mucus. Faeces tarry.

P. M. Changes:—19 live adult filariae were found in the subcutaneous connective tissue in different parts of the body. Heart blood contained many Microfilariae in a drop of blood, though only 2 to 3 *m. f.* were found in the peripheral blood at the commencement when the dog was alive. Lungs and other internal organs contained *m. f.* but their number was less than in the heart blood.

Neosalvarsan Treatment:—

Case No. 11:—Tan pariah dog. Number of *m. f.* 32 to 35 in a drop of blood.

1st day	0.15	gram.	of Neosalvarsan	in 5 c. c. of sterile water	intravenously.
4th "	0.15	"	"	"	"
7th "	0.3	"	"	"	"
10th "	0.3	"	"	"	"
13th "	0.45	"	"	"	"
16th "	0.45	"	"	"	"
19th "	0.6	"	"	"	"
22nd "	0.6	"	"	"	"

No disappearance of *m. f.* Their number remained the same although the dog was kept under observation a fortnight after treatment.

Lugol's Solution :—

Case No. 12 :—Red and white dog. Number of *m. f.* 24 to 26 in a drop. Lugol's solution of Iodine was given intravenously in this case.

1st day	5 c.c.	
3rd "	5 c.c.	
5th "	10 c.c.	
7th "	15 c.c.	
12th "	20 c.c.	Slight thermal reaction and off feed but no change in <i>m. f.</i> rate.
20th "	30 c.c.	Symptoms as above. No change in <i>m. f.</i> rate. Treatment discontinued.

Conclusion :—Filariasis amongst dogs seems to be fairly common in this province. It is quite probable that many of the skin diseases are due to these parasites. Unfortunately, the various experiments conducted with a view to find out any specific drug against these parasites have failed. It would appear that Sodium Antimony Tartarate causes, within limits, a lessening of the number of *m. f.* in the peripheral blood, but it certainly has no lethal effect on the adult filariae.

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HETEROPHYES SPECIES FROM DOGS IN MADRAS*

BY

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The present paper is an outcome of an examination of some trematodes from the collection in the Madras Veterinary College. These small trematodes, described in this paper were collected by Messrs. M. R. V. Panikkar and L. S. Parameswara Ayyar from three stray dogs in Madras in March, 1929, out of 19 dogs destroyed in connection with the collection of some other parasites. From each dog, about 30 parasites were obtained from the small intestines. As far as we are aware, no trematodes belonging to the genus *Heterophyes* have been reported from other parts of India.

The body of the worm is flat and the sides taper anteriorly. At the posterior end it is slightly flattened or has a small notch where the excretory pore opens. The surface of the body is covered over with scales directed backwards and the distribution is sparse posteriorly. The length of the mature worm varies from 1.4 mm., to 2.1 mm., and the breadth from 0.65 to 0.95 mm., in the middle. The greatest breadth is a little anterior to the region of the testes. The circular mouth is surrounded by an oral sucker 0.07 to 0.09 mm., in diameter. The ventral sucker is large and well developed ranging from 0.3 to 0.47 mm., in diameter and is situated about the middle of the worm. The genital sucker is situated behind the ventral sucker a little to the left and the plane of its surface is at an angle sloping towards that of the ventral sucker, more or less circular in outline, with a diameter from 0.16 to 0.26 mm. There is a crown of rodlets interrupted on the anterior side of the genital sucker adjoining the ventral sucker and the rodlets tend to get shorter in length as they approach the interrupted side. Each rodlet has 2 to 4 barbs, which lessen in number as the former gets shorter. The barb at the fixed end (away from the centre) is double, like the letter 'V', the angle of it is joined to the rodlet. We are not aware of anyone else describing this character in the genus *Heterophyes*. The other barbs are simple and are perpendicular to the surface plane of the genital sucker.

The pharynx is oval with thick muscular walls and is situated about 1 mm., behind the oral sucker. The width of the pharynx is

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about 0.12 mm. It is followed by an œsophagus having an average length of 0.19 mm. The distance from the oral cavity to the bifurcation into cæcæ is 0.41 mm. Each cæcum reaches almost the posterior end of the worm after curving round each testes and the left one has its extremity fairly perceptibly dilated.

The testes lie in the posterior end, they are elliptical in outline and are side by side, and the left one is a little in front of the other. Their long diameters form an acute angle posteriorly. There is a vas deferens between the testes, or nearer the left one and continues forward and swells into a globular body to form a seminal vesicle. The position of this is almost in the middle line in a level with the genital sucker and to its right side.

The ovary is median in the posterior third of the body anterior to the testes; behind this is a small globular shell gland. The follicles of vitellaria are on the lateral margins and they run up to the level anterior to the ovary and they push inwards dorsally and meet. They lie as far back as the level of the anterior borders of testes or a little behind it. There seem to be 14 to 16 follicles on each side. Most of the space between the ventral sucker and the testes is occupied by the uterine coils. The eggs are operculated and may show a tiny knob at the end opposite to the operculated one. They are yellow or brownish yellow in colour. Each measures 25 μ in length and has a thick shell.

Upto the present, seven species of Heterophyes have been described by Ransom (1920). From the table given below, it may seem that the present species is allied to *H. persicus* (Braun 1901) Looss (1902) with which it agrees.

1. The vitellaria dorsally extend inwards nearly to the anterior border of the ovary.
2. It has 62 to 70 rodlets in the genital sucker.
3. The situation of the genital organs in general.

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Microphotograph of the worm.



Rodlets highly magnified showing the double barb at the end.

**DISCUSSIONS OF A FEW FILTERABLE VIRUSES
INTERESTING TO THE VETERINARIAN***

By

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(Paper read at the Seventh All-India Veterinary Conference, Bangalore, 1930).

I appreciate the honour you have done me in asking me to open a discussion on some of the diseases due to Filterable viruses which are of interest both to the human and the animal doctor.

The veterinarian has always had the good fortune to see diseases in their original aspect, uncomplicated by the psycho-neurasthenic phenomena, so commonly present, in the human adult. I can only compare him to the pediatrician, who, in handling the child, sees all the phases of disease in their objective symptomatology only.

The animal doctor has contributed a very great deal indeed to our sum total knowledge, of the diseases that human flesh is heir to, as so many of them are common both to man and animal. Perhaps, the whole science of Bacteriology and Immunology may be said to have their inception to veterinary science, for the diseases of the stockyard, attracted that master mind Pasteur. Experimental medicine has chosen the smaller animals, in spite of the protests of the anti-vivi-sectionist, for research into the comprehensive nature of artificially induced disease, and therefore the purely human medical man has to cross into the realms of veterinary science as well.

Man being defined as a tool-using animal, has always found it necessary to utilise animals for various purposes. He is thus brought in contact constantly, with various domestic animals which might either prove to be reservoirs of disease or transmitters of the same. Perhaps, nowhere is this more clearly seen than in the realms of parasitology, e.g. Hydatid so easily transmitted from dog to man. *Rabies*, *Bovine tuberculosis*, *Glanders*, and a host of other diseases, not so common in man originally are all brought to him, by contact with other domesticated animals.

Of the specific question of Filterable Viruses themselves, in discussing them, we have to traverse into almost all the fields of known knowledge to obtain some definite visualisation of what their nature might be. The phytopathologist is as much concerned as the pediatrician, or as the psychoneurologist. Mosaic diseases of various plants like tobacco, wheat, sugarcane, and tomatoes, the vexed cow-pox or small-pox vaccination question, the cause of epidemic and endemic encephalitis, all these have been labelled to be caused by

(We apologise for the delay in publishing this article. Ed. I.V.J.)

viruses of ultramicroscopic dimensions. Nor is this all—Barnard and Gye put up an experimental plea, long since disowned, perhaps, that the cause of cancer was a virus. We certainly have therefore to examine their nature from every point of view.

The name Filterable Virus denotes that these disease-causing particles (we will suspend for the moment any judgment as to whether they are organised or unorganised) are able to pass through the pores of any small dimensional type like a Berkefeld, or a Chamberland filter which usually holds back bacteria. The physicist and the chemist are also therefore, primarily concerned as to their behaviour towards other substances, their absorptivity, electrical behaviour, and so on, to see whether they are protein or non-protein in nature.

On the other hand, in many cases where the pathogenic etiological factor is not well understood either in human or plant pathology, it is now the fashion, perhaps, to relegate such understood causes of disease to some Filterable Virus. This seems to be a real danger; for where we do not know, the exact cause of disease to the unlabelled limbo of the Filterable Viruses does not stand scrutiny.

Since we do not know beyond a few elementary facts, anything about how these particles bring on disease, we are unable to adopt any preventive measures regarding either their inceptiveness or their dissemination. Economically, therefore, these diseases are able to cause the greatest amount of damage in the realms of economic botany, animal husbandry or human welfare. One has to remember only the dread epidemic of *Rinderpest* and how it kills cattle. There it is that the veterinarian is of such supreme importance, as he is at liberty to control a herd of animals in all phases, diet, movement, sleep, number of offspring, etc., unknown to the human doctor, as such measures will be thought to encroach on personal liberty.

Of the diseases said to be purely due to Filterable Virus and which perhaps have stood the test of experimental Science, it may not be out of place to catalogue those known according to the host which these viruses attack.

Bacteria have a supposed Filterable Virus, which destroy them, known as Bacteriophage. The works of d'Herelle and host of others in the past few years evince great interest excited by this virus, if it can be so called.

Plants are recognised to suffer from diseases, which are collectively termed as due to viruses coming under the comprehensive name of Mosaic disease ever since the monumental works of Beijerinck and Iwanowski.

There are at least four known diseases due to viruses attacking caterpillars, etc., the classic example being Sacbrood disease. There are 40 diseases at least which have been recognised as due to Filter-passing Pathogenic agents which cause sickness in animals, most of

them, highly contagious, thus producing great economic loss. Many of them either fortunately do not exist or have not been recognised as yet, in India like Heartwater, fever of sheep, agalaktia, various types of pernicious anaemia in horses, etc.

Others like *Foot and Mouth disease* or *Rinderpest* are causing a very great amount of loss indeed in our country and we are as yet beginning to counteract these evils.

Four diseases at least, are known which are common both to man and animal; we will not discuss here the priority of affection. *Rabies*, the question of *Alastrim*, *Cow-pox*, *Small-pox* or *Variola* and various *Varioloids* the specificity of each of which we are yet in great doubt. All these are dread diseases which seem to be common to the animal kingdom.

There are seventeen diseases which are affecting humans said to be caused by Filterable Viruses; many of these have been experimentally transferred to animals showing that while they are not normally immune yet show greater resistance under natural conditions than human beings; *Poliomyelitis* is a famous example. On the other hand the purely human diseases like *Measles*, etc., cannot be as yet experimented on.

We will not talk about various *Rickettsias*, etc., which are on the border line of Filterable Viruses, and will be taking us too far out of our field.

The vexed question of cancer i.e., malignant tumour formation and the question of its Etiological factor being some variety of Filterable Virus, cannot be tackled in the short time allowed. I can only refer those interested to the works of Gye, Murphy, Cori and others on the one hand and Warburg and others on the other, representing two different schools of thought.

Coming to some of the more specific problems, we have the question of *Rabies* and the question of its prevention. Curative therapeutics, in one sense, if it is allowable, in the form of anti-rabic injection is certainly of immense value but the question of prevention, in the form of dog inoculation, how the virus is transmitted, what is its reservoir, what are the vectors if any, in short, the complete epidemiology of the disease is so ill-understood that we are just in the stage of only realising our ignorance.

The veterinarian has every chance of studying the disease and its epidemiology and we look for light from him only.

A disease of Poultry farmyard important economically, because it disables fowls laying eggs, is due to a Filterable Virus called *Epithelioma Cantagiosum*. The virus attacks the comb, wattles,

and the skin of the young chicken. The fowl quickly loses its weight, shows brownish yellow mottling on its ornamental appendages; it shows lessened sexual appetite and quickly the female loses its power of laying eggs. Economically therefore it is a danger. The disease in a farmyard becomes quickly contagious and travels from bird to bird, although various strains of fowls show varying powers of resistance to the onset of this disease.

This virus produces, moreover, what are known as inclusion bodies. Large vacuolations of definite shape, which take on an indefinite acid strain, are found. The virus is resistant to antiseptics of various kinds, and is largely heat resistant. It is absorbed by various gels like Silica, etc., and is found to be what is called amphoteric i.e., being attracted both to the positive and the negative pole of an electrical field. Unfortunately there does not seem to be any known method of cultivating it in vivo and in tissue cultures when the same kind of inclusion bodies seem in the sections are said to be seen. I have curiously said a few points about this virus and may I request my veterinary friends to pursue investigations on the subject.

Sacbrood disease of bees is another disease of great importance and while we do not cultivate bees for their own sake, in this country systematically, yet I expect that we will be faced with problems of this type very soon and therefore we will have to learn various aspects of this disease. It seems to offer the same type of problems as Epithelioma contagiosum.

Of other aspects of some of the virus diseases I do not propose to dwell as I am afraid I will keep you too long.

I propose to take another virus disease for your presentation as it is purely an animal disease, and yet it offers various methods of approach of study to some of the problems we are vitally interested in. Sanarelli, described in 1898, what is called infection Myxoma of rabbits. Here the virus seems to affect only the mucopurulent discharge exudes. The animal dies in a short time, and the temperature at the time of death tends to fall subnormally. At autopsy the internal organs are all found to be normal. On the other hand all the organs are infective, and an emulsion in physiological saline of crushed tissue centrifuged and made bacteria free and if necessary passed through a filter, is found to be very infective. The blood cells, specially the white corpuscles, of the yet live animal, are very infective indeed. So also the mucopurulent discharge referred to already is found to be infective to other rabbits.

This disease is interesting to many ways: so far the inclusion bodies though described have not been substantiated and probably

do not exist. The virus seems to have a specific relation to mucous membrane and it is very infective. Pathologically, the site of inoculation does not show anything except a myxomatous degeneration of cells. Therefore, this disease of rabbits seems to be related on the one hand to specific virus diseases like Variola or Small-pox, and on the other hand to a contagious variety of malignant tumour formation that seem to be on the border line between various forms of pathological conditions i.e., contagious tumour formation and contagious specific infectious disease.

I have referred to what seems to be few virus diseases which I think will be of interest because of their economic value or because of the ancillary problems that they are related to. The need for an open mind and an observant eye emphasised so often that it might sound far too platitudinous and hackneyed if I also add my voice of the chorus of those who have already done so. The Veterinary Officer more than any other has unique opportunities for studying diseases and one can always hope for great contributions from him.

THE SERUM-VIRUS ANTI-RINDERPEST INOCULATION AND ITS DURATION OF IMMUNITY IN THE FIELD.

By

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From 1925 onwards, Mysore has happily adopted the "Serum-simultaneous" method of Anti-rinderpest vaccination as advocated by the Imperial Institute of Veterinary Research, India. We have evidences beyond doubt that this method can be safely carried out throughout India with immense benefit to the nation at large.

On 20th December, 1925 in the village of Hosahalli of Shimoga Taluk—the Malnad or the hilly region of Mysore, 120 animals were protected against this formidable disease. The serum then used was the one supplied by the I.I.V.R. Muktesar, India, and the virus was one drawn locally.

Rinderpest broke out again in the very same village on 22-11-31 among the ones uninoculated by the S. S. method of inoculation. The unprotected animals were protected on 5-12-31. Six animals, two cows and four bullocks which were protected in 1925 were tested for immunity by administering 5 c.c. of the virulent blood twice, once on 6-12-31 and again on 15-12-31. The animals were kept under observation till 26-12-31 and they showed no signs of any reactions whatsoever. The temperature was taken daily and found normal. Feeding too was normal. The virus used was tested for

potency by administering $\frac{1}{2}$ a c.c. subcutaneously to two unprotected bullocks which showed rise of temperature on the 4th day along with other primonitory symptoms of the Malady. Intravenous injections of 200 c.c. of serum for each, were given to the controls as they had to be saved.

The above account is proof positive to demonstrate that the immunity conferred on animals by the "Serum-simultaneous" method of Anti-rinderpest inoculation lasts for more than six years.

A SIMPLIFIED METHOD OF ADMINISTERING THE ANTI-RINDERPEST SERUM-SIMULTANEOUS INOCULATION.

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The principle involved in the S.S. inoculation and the technique advocated by the Imperial Institute of Veterinary Research, India, in this connection, are no doubt known to every veterinarian. It is not my purpose here either to discuss the principles or criticise the technique obtaining at present. All that I desire to drive home is the fact that the present method while being quite suitable in case where only a small number of animals have to be protected, have several draw-backs when a large affected area is taken into consideration. In the first place it is very difficult for a single veterinarian to tackle more than three to four hundred animals a day, on an average. Secondly the amount of labour and risk to the operator in making two pricks, one on each side is considerable. The fact that the dual pricks are likely to render the animals more frisky, is also a great handicap to the operator and consequently a large number of helping hands is called for. The insistant demand on the veterinarian's time coupled with the fact that the virus cannot keep long render it absolutely necessary, that work should be done as briskly as possible.

It is my opinion, drawn from experience in areas where rinderpest has been virulent, that matters could be considerably simplified by varying the technique a little and adopting the procedure detailed below.

PROCEDURE.

The needle is inserted direct into the muscle and the virus injected. By puckering the skin the needle is brought out of the muscle but not out of the skin, and then pushed into the subjacent

subcutaneous region, and the serum administered "*Virus Intramuscular and serum subcutaneous on the same side.*" There is practically no chance of the serum being mixed up with the virus, since the latter is in the muscle higher up and the former in the subcutaneous region lower down.

The advantages of this method are obvious. While it would be difficult to protect more than one or two hundred cattle a day by the usual method at least twice that number could easily be protected by adopting this variation. It would also make things considerably easier for the surgeon and enable him to cover a larger area and thus bring the situation under control earlier. Less of extra help would be needed to control the animals as no more than the minimum amount of pain would be caused. All this would help considerably towards expediting the veterinarian's work.

I have drawn up a schedule of statistics relating to the inoculation, I have performed of late, with the help of this method. Although I have experimented on more than a thousand animals, I have not known a single instance when this method has failed.

I therefore recommend it to my brother veterinarians who find themselves handicapped for help.

Statistics of S.S. Inoculation done by my method.

No.	Place where S. S. was done.	During the month of.	No. of Inoculation.	REMARKS.
1	Shimoga	Feb. 1931	500	Most of these tested for immunity by giving 5 c.c. R.P. Virus after one month and were found to be immune to rinderpest.
2	Gajanur	March „	308	
3	Chikagopenahalli	April „	375	
4	Belalkatta	June „	600	

SOME OBSERVATIONS ON CANINE TYPHUS.*(Stuttgart Disease, Dog Plague, Black Tongue, Infectious
Hæmorrhagic Gastroenteritis.)*

BY

W. V. SOMAN, G. B. V. C., (BOM.),

Veterinary Officer, Jaora State.

Canine Typhus is an epizootic disease due to some morbid poison as a result of contagion and infection and is known in some parts of India. During the last few years it has become a great trouble to the Foxhound Clubs. No organism as to the cause of the disease has been traced yet and nothing much is known about the virus. It is believed that it is usually transmitted through the excreta of the affected animals. Virulence of the contagion contained in the discharges is diminished if kept in hot places and hence there are less cases recorded during the summer. It is therefore of some importance to those that have canine practice.

Pathology:—The virus primarily attacks the digestive tract commencing from the buccal membrane and tongue. It turns it to a purple or chocolate colour, and on it small ulcers appear which could be seen in later stages in the intestinal mucosa also.

The disease seems to affect dogs of all ages but it is found more in the old and weak ones. Although it occurs periodically, it makes its appearance immediately after rains before it gets very cold, and cases may be found throughout the year in comparatively less numbers.

The course of the disease ranges from a few days to a few months and chronic cases may linger for over an year. Relapses are sometimes observed and a second attack after complete recovery of the case is not uncommon.

The disease seems to occur in different forms which could roughly be called as mild, acute and chronic. The symptoms in different forms do not differ much but in acute cases the development of the disease is very quick and rapidly fatal. Such cases are usually accompanied by some complications such as acute nephritis, fits, &c.

Symptoms:—In the mild form the dog shows little dullness accompanied by constipation and want of appetite. In a day or two the animal gets shivering fits and temperature which may rise to about 103° F. If the mouth is examined it is found pale, turning to brown colour in later stages, and it gives a bad odour. It is also observed that there is increased thirst and frequent urination. Such cases usually recover after careful nursing and proper treatment.

In acute cases, the temperature comes on suddenly without any previous symptoms. The dogs start vomiting and there is complete suspension of appetite, increased thirst, quick wasting and extreme weakness. There is constipation followed by diarrhœa and the fæces are blood stained. Vomiting is severe and sometimes bloody. Later the vomit is of a dirty coffee colour. Mouth is foul. Ulcers are seen over the buccal membrane and tongue and in some cases the tip of the tongue is found necrotic. Conjunctivitis is also present and the eyes get blood shot. Majority of the dogs die and a very few cases may recover and remain weak with a depraved appetite for weeks together.

In chronic cases the symptoms come on gradually and some acute cases may also become chronic and linger for months together.

General symptoms observed in all the three forms are rise of temperature which frequently goes to sub-normal after a couple of days (In one case the writer observed the temperature going down to 95° F). Usually there is frequent urination but the quantity is small. Urine high coloured and turbid.

Post-mortem Symptoms:—The cavity of the mouth is ulcerated or necrotic, particularly about the gums, and on the tonsils. Ulcerations are also found along the digestive apparatus. The stomach is usually contracted and contains rarely any food material, covered with hæmorrhagic spots and emits foetid odour. The peritoneum is congested and the liver and kidneys are hyperæmic. Kidneys usually present symptoms of suppurative nephritis. Mesenteric glands and spleen are also enlarged.

Treatment:—As soon as canine typhus is suspected the dog should be immediately isolated. Careful feeding is the most essential part of the treatment as the whole digestive tract is affected and the animal has practically no appetite. Lukewarm milk with little brandy may be given. Wash the mouth with some antiseptics such as Hydrogen Peroxide. If ulcers are present they should be painted with Tincture Iodine Rectificatus and Tincture Benzoinæ Coequal parts. Enemas of lukewarm saline, twice daily, relieve much pain. At least two pints of water should be used, so that the lower part of the bowels is properly washed. Dimol, either in the form of pills or syrup has been found useful internally. The writer has tried Iodine Terchloride in over 50 cases and it has given him very good results. Four minimus of Iodine Terchloride in 1 oz of water is given twice daily. In acute cases Tincture Iodine Rectificatus 8 m. in 10 c.c. of Aqua Distillata is given intravenously every second day.

Tincture Iodine or Iodine Terchloride has its good effects in many ways in this disease. Such cases tolerate increasing and intensive doses given continuously for a prolonged period until the symptoms of the disease have abated.

In cases of collapse subcutaneous injections of normal Saline solution at 100° F. have given good results.

In recoveries which show anæmia and debility injections of Tryparsamide have given excellent results.

Clinical Articles.

RUPTURE OF BLADDER IN A BULL.

By

K. B. NAIR, G.B.V.C.,

Bovine Surgeon and Professor, Bombay Veterinary College, Parel, Bombay.

An article on "Rupture of Bladder" in cattle by Dr. P. S. Rao, appeared in the first issue of the *Indian Veterinary Journal* in August 1924; and the experience of other veterinarians was then invited. No other article on the subject appeared in the *Journal* in these 7½ years, and hence I believe that this condition is not very common in cattle.

In the Bai Sakarbai Dinshaw Petit Hospital for animals, attached to the Bombay Veterinary College, in a year, on an average, more than one thousand cattle impatients are treated; and during these 7½ years I had an occasion to record only one case in a bull in 1931 December. This would show that "Rupture of Bladder in cattle" is rare in Bombay.

I give below the full record of the case from the day the animal was admitted in the College Hospital, and I hope that this would interest the readers of the *Indian Veterinary Journal*.

A black and white bull, about 8 years old was admitted as an impatient in the Bai Sakarbai Dinshaw Petit Hospital on 17th December, 1931 with a history that the animal had not passed urine for about a week.

The animal was under the treatment of a local veterinary medical practitioner.

Symptoms shown on admission:—The animal was dull. It was ruminating and its appetite was fair—Bowels costive—Urination suspended—Posthitis present—Pain on pressure on loins—Abdomen not distended—No change in gait and respiration—Temperature

100° F. Exploration per rectum revealed bladder empty and kidneys normal in size. Examined the prepuce for calculi and found nothing.

Diagnosis:—It was provisionally diagnosed as Nephrolithiasis.

Treatment:—Enemata of soap and water, and a dose of oil internally.

R

Soda bi carb	oz 1
Pot. acet	oz 1
Tr. Hyocyam	oz ½
Spt. aeth: nit	oz II
Treacle	oz x
Aqua	ad oz xx

Diet:—Barley water and hay tea.

19—12—31. The animal passed very small quantity of urine twice during the day. Bowels normal. Ruminated. No change in gait and respiration. Temperature normal. The mixture was repeated.

20—12—31 The animal was dull. Dribbling of urine only. Loss of appetite. Exploration per rectum showed bladder empty. Temperature 100° F. Mixture repeated.

21—12—31 Animal very dull. Staggering gait. Loss of appetite. No dribbling of urine. Temperature 99° F.

Urithrotomy was performed as an explorative measure for the presence of calculi, sound was passed with no impediment and no calculi was present in the bladder. No urine came from the urethral opening. The animal was in pain and a dose of chloral was administered. The animal died on the 21st evening.

22—12—31. **Post-Mortem Examination:**—Abdominal cavity was full of urine. Bladder empty. Kidneys normal. A well defined circular perforation in the wall of the bladder, and calculus of the size of a pea with flinty edges embedded in the curve of the penis were found.

P. S:—My thanks to Mr. K. R. S. Iyer, G. B. V. C., Lecturer, Bombay Veterinary College for assisting me to do the operation.

DRACUNCULUS MEDINENSIS (GUINEA-WORM) IN VETERINARY PRACTICE.

By

MATI LAL GHOSAL, G.B.V.C.,

Veterinary Surgeon, Bikaner State, Rajputana.

Although equines, bovines and canines are said to suffer occasionally from guinea-worms, in practice very few cases are seen. It is very often seen among human beings in Malwa, Central India and Rajaputana. I have worked for several years in these regions and only one case suffering from guinea-worm came to my notice.

The subject was a Chestnut C. B. mare, 3 years of age, from Kumbhana, a village about 60 miles away from Bikaner.

History:—The animal was brought to me on the 15th August, 1931, with what they call a "Zaher Bad," because she had an oedematous swelling of the off hind at the fetlock, which it would appear, commenced about the beginning of the month. She was usually fed on green "Shewn" grass and watered in a tank in the village which collects water from the surrounding places during the rainy season. There was no marked systemic disturbance.

Physical examination:—The animal was in good condition. Oedematous swelling of off hind extending below the hock with serous discharge from a wound about $\frac{1}{2}$ " diameter and $\frac{1}{4}$ " deep at the external aspect of the fetlock joint. The swelling was hot and painful. Temperature and pulse normal.

Provisional diagnosis:—It was diagnosed as a wound resulting from a puncture.

Treatment:—The region was clipped and washed thoroughly, first with soft soap and hot water and then with a solution of Hydrogen Peroxide. The wound was dressed with Tincture Iodine and Antiphlogistine was applied to the swelling. A dose of Tetanus Anti-toxin, 1500 American units, was given subcutaneously. In her drinking water Mag. Sulph, $\overline{\text{Z}}$ ii Ammonium Chloride $\overline{\text{Z}}$ ii and Pot. Nitras $\overline{\text{Z}}$ ii was mixed.

On the second day while re-dressing the part, a white thread like object was seen at the bottom of the wound; it was pulled with the dressing forceps and when about an inch of it came out, it was recognised as a guinea-worm. Immediately, I rolled the protruding portion of the worm on a small stick, tied it with silk-thread so that it may not slip in and kept it on the side of the wound, soaked a lump of absorbant cotton in cold water, placed on the wound, put on a bandage and instructed the owner to douche it with cold water frequently.

On the third day I pulled some more length of the worm slowly with a dressing forceps. The bandage was re-applied with instructions to the owner as previously.

In this manner I dressed the wound for four days and got out about a foot of the worm.

On the 8th day accidentally the mare got loose and when she was brought to me I found the bandage had gone loose and the worm damaged considerably.

The part was dressed as usual and in about a week's time the sore healed completely. The animal was examined once again about a fortnight after discharge and excepting for a scar on the fetlock nothing else was seen. If the worm had broken on the day the mare got loose, the consequences may have been serious, but perhaps in this case the whole worm came out, hence the healing was rapid.

RUPTURE OF DUODENUM IN HORSE.*

By

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

Veterinary Inspector, Civil Veterinary Department, Sind, Sukkur.

The case to be described was quite a peculiar one, and, in the experience of the writer, first of its kind.

Subject:—Bay Australian Gelding 6-7 years old.

History of the case:—The animal was brought from Calcutta and the owner had him raced for about 6-7 months at Karachi regularly. On the 4th July, 1929, the horse got an attack of Colic at midnight, which was fairly severe, and got over the attack after the usual treatment. Again on 6th July, 1929, he had a repetition of colicky pains and a rise of temperature upto 102° F. For some time there were several attacks of Colic at 2 or 3 day's intervals and subsequently he was discharged from the hospital on 27-7-1929, as "cured". He worked normally until 30th October, 1929, when the same trouble arose and lasted upto 16th November, 1929. It was thought that frequent suffering of the horse with colicky pain was probably due to intestinal calculi. The horse again worked well and won a race also. Then he got the last attack on the night of 8th January, 1930 which was very violent and resulted in his death.

Treatment:—The horse was treated with Chloral Hydrate, Tincture Cannabis Indica, Morphia, Turpentine and Linseed Oil and then with Ammon: Carb: and Nuxvomica according to the needs of the case.

*Read before the 1st conference of Sind C.V.D., subordinate service association held at Jacobabad on 31st January, 1932.

Post-Mortem Examination:—On autopsy the stomach, the small and large intestines were found highly congested throughout their course. There were ulcers and nodules of black or dark brown colour on the serous coat of duodenum and jejunum. One big ulcer about 5 inches from the pylorus was found ruptured causing hæmorrhage, and contents of the intestines consequently escaped into the abdominal cavity.

Other organs appeared normal.

The manifestation of these ulcers or tumours on the serous coat of the duodenum and Jejunum was quite peculiar and seemed to be of long standing and was the probable cause of colicky pains at frequent intervals. Portions of the intestines were sent to the Director, Imperial Institute of Veterinary Research, Muktesar, Kumaun, who kindly replied as follows:—

"Subject:—Examination of specimen material from Bay Australian Gelding "Blue Peter".

Histological examination of the tumour like lesions on the surface of the portions of the intestines shows that they consist of so called "Organised" blood clots, namely blood extra-vasation which has become invaded and replaced by connected tissue. The cause of the hæmorrhage has not been determined."

The writer acknowledges, with thanks, the valuable advice of Mr. J.H.G. Jerrom, M.R.C.V.S., I.V.S., Superintendent, Civil Veterinary Department, Sind and Rajputana in dealing with this case.

I shall feel obliged if any of my professional colleagues will throw further light on such ulcers or tumours.

SKIN GRAFT TO A WOUND.

BY

K. S. PRAKASA RAO, G.M.V.C.,

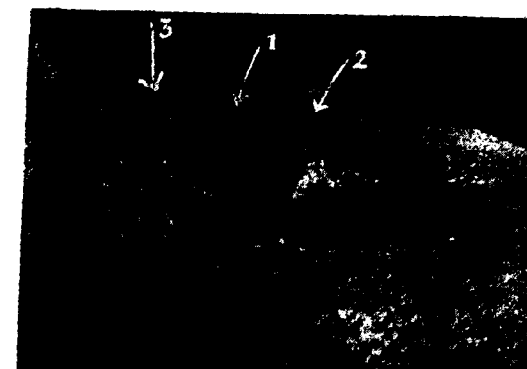
Veterinary Assistant Surgeon, Tanuku, Madras.

Subject:—One bullock case No. 135 was admitted to the Dispensary as in-patient on 5-5-31.

History:—The animal, in its attempt to walk over an old iron jagged pan, placed its hind left limb in the hole in the centre of the rust-eaten iron pan. In trying to extricate the limb the injury to the tendons and skin resulted.

Treatment:—The wound was cleaned, tendons sutured, and bandaged. Daily attention was paid and on 23-5-31 it was decided to apply grafts of skin from elsewhere to the wound, since it was big and appeared to take a long time to close.

The wound and surrounding skin was washed with soap and water. The skin surrounding the wound was shaved. The whole part was again washed with sterile water first and then with a 5% solution of saline. Superficial layer of the wound was removed with a scalpel. When the bleeding completely stopped and the oozed-out serum was visible, two thin slices of skin of the thickness of writing paper were removed by the play of scalpel and without touching their raw sides, were put on the raw serum-laden skin. Sterile cotton wool was pressed on the grafts to remove minute clots of blood under the grafts. A layer of cotton wool was placed over the wound and it was bandaged. The bandage was not interfered with for three days. On the fourth day sterile water was used to carefully dislodge the cotton wool from the graft and sterile vaseline on lint was used as further dressing. On 30-5-31, there appeared an abscess under the wound, which was opened and evacuated. While removing the pus the animal shook and the grafts were scratched off by the contact of finger nail.



On 30-5-31, fresh grafts were again applied. In a week the grafts became completely embedded in the wound and began to grow very rapidly. They were photographed on 19-6-31.

This may be published for the information of those who may be willing to adopt the procedure in healing extensive wounds more quickly.

N. B.—The animal was cast and secured for exposure.

Nos. 1 and 2 in photo. The dark spots are the grafts. The white ring surrounding each graft is the newly grown skin.

No. 3 is the new skin formed by the natural healing of the wound.

NYCTALOPIA IN A BULLOCK.

BY

M. LAKSHMANA RAJU, G.M.V.C.,

Veterinary Assistant Surgeon, Tekkali, Madras.

Nyctalopia or night blindness is rare among veterinary patients and two bullocks suffering from this complaint were under my treatment at my dispensary. It is due to an abnormal slowness of dark 'adaptation' and a pathological change known as 'retinitis pigmentosa' is present suggesting an impaired function of the visual purple. Visual purple is present in the retina (nervous coat of the eye) of all animals and is specially abundant in those whose habits are nocturnal or who live underground.

History:—A local bred white bullock aged about 8 years was brought to the Dispensary on 21-5-31, with the history that the animal had perfect vision during day time and it is not able to see objects in darkness as evidenced by the deviation, from regular path and striking itself against bushes, trees, etc., whenever it is taken for cart work during nights. Further he informed me that he did not know the duration of the complaint as he purchased the bullock a month back. The animal was tested by me at the dispensary during one night and found the history of the case correct.

Treatment:—*1st day*.—An enema with soap water was given and the following medicine was prescribed:—

R	Mag. Sulph	℥xii
	Ammon Chloride	
	Potash Nitras	aa℥ii
	Aqua	ad Oi
	Mft. haust	Sig now.

A few drops of Ol. Recini were also instilled into the eyes.

2nd day:—No improvement was noticed, but the same external treatment was continued.

3rd day:—No improvement was noticed. A few drops of solution of Pilocarpine Nitras (2 grs. to ℥i) were instilled into the eyes.

4th day:—No appreciable improvement. The same treatment was continued.

5th day:—The vision in darkness was better than before. The same treatment was continued.

6th day:—The bullock had its normal sight restored in darkness.

The treatment was continued for another four days, when the animal was finally discharged cured.

Pilocarpine causes contraction of the pupil and ciliary muscle whether applied locally or administered internally. This action depends on the stimulation of the nerve terminals or the motor oculi and it hastens the regulation of visual purple.

Note.—I request the members of the profession to inform me whether such cases were seen by them and if so the treatment adopted by them. Another similar case was also successfully treated with Pilocarpine Nitras (2 grs. to ℥i).

URINARY CALCULUS IN A BULLOCK.

BY

V. K. CHATUPHALE, G.B.V.C.,

Veterinary Assistant Surgeon, Barsi, Bombay.

A white bullock the property of one Dugadu Ramachandra resident of Pungri in Barsi Taluka was admitted in the Barsi Veterinary Dispensary on 23-6-30, for retention of urine.

History:—The owner of the bullock stated that the bullock was alright some 6 days back and for the first three days or so he was passing urine in drops and that during the last three days, there was complete cessation of urine. His usual food was Kurubi (Jawari Stocks) during the 8 months of the year and green grass during the 4 months of rainy season. Besides this, grain feed, especially oilcakes were being given to the bullock.

Symptoms:—Temperature 103.4°. Stupid, no appetite, respirations 18, pulse 64. Total suppression of urine. Distention of the belly. Dung not passed since the last two days. After backraking and giving an enema rectal examination showed that the bladder was fully distended.

Diagnosis:—Something very hard must have blocked the urethral canal and the suppression of urine might have caused the rise in temperature.

Operation:—The bullock was firmly secured and a sound (an ordinary sterilised blunt umbrella wire) was passed through the urinary meatus into the urethra. The sound came in contact with a hard body at a length of 9 inches.

After removing the penis through an incised opening on the sheath the sound was again passed, and after feeling the hard body a longitudinal incision was made on the lower surface of the penis on the urethra so as to expose the hard body.

The calculus was removed, it weighed 8 grains, was very hard and had a bright metallic sheen.

The incision on the urethra was sutured with cat-gut and dressed with Boric Acid. The penis was reverted to its place in the sheath

and the incision on the sheath was also sutured with cat-gut and dressed with Tr. Iodine and Boric Acid.

The bullock was made to stand and after half an hour or so the bullock passed copious urine. The following mixture was administered.

R

Liq. Ammon Acetas.	℥iii
Spts. Aetheris Nitrosi.	℥ii
Pot. Nitrates.	℥iv
Mag Sulph	℥viii
Aqua	ad ℥xx
Mft. haust.	
To be given at once.	

As the bullock was off feed, rice gruel 2 quarts was given.

On the 24th of June 1930, the temperature of the bullock was 103°F. Bowels still costive and the bullock was off feed. Urine passed only in drops. Occasional colicky pains were noticed. An enema and the following mixture was given.

R

Oil Terebinthinae.	
Tr. Asafoetida	
Oli Communis	aa ℥i
Mft. haust.	℥xx
To be given at once.	

Dressing of the wound on the sheath was continued.

The following day, the temperature was normal but the bullock was off feed and urine was again suppressed.

The bullock lived for three days more, but the temperature was sub-normal. Stimulants in rice-gruel, enemas and fomentations of the belly (scrotal region) with warm bedding and clothing was the only treatment.

After death a post-mortem was conducted. Nephritis was detected, the right Kidney was immensely inflamed weighing 4½ lb in weight while the left Kidney was 2 lbs and 10 oz. The bladder was full of urine.

The bladder, the urethral canal and the pelvis of the kidneys were closely searched but no more calculi could be detected.

Conclusion:—Nephritis was probably the sequel of the suppression of the urine, caused by the blocking of the urethral canal by the calculi.

I have seen some stones (calculi) in men. They were of large size. The calculi in bullocks rarely exceed the size of a pea. Human calculi are rather brittle and are composed of thick layers and have no metallic sheen. I have collected three more calculi in cattle and sent them to the Director, Nutritional Research Laboratory, coonoor, for chemical Analysis.

[The writer is requested to send the Report of the Chemical Analyst. Ed.]

PROTRACTED LABOUR.

BY

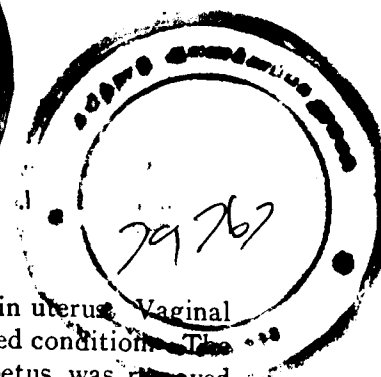
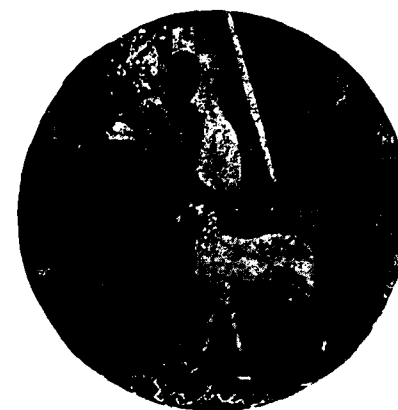
J. C. DAVID, G.M.V.C.,

Veterinary Assistant Surgeon, Tellicherry, Madras.

Case:—A she goat, healthy in condition.

History:—On the 26th April, 1931, she was admitted as an out-patient. The owner gave me to understand that the she goat delivered one kid on the previous Sunday the 19th April 1931.

Symptoms:—Since delivery, she has been straining occasionally and micturating frequently in small quantities.



Diagnosis:—Palpation revealed one kid still in uterus. Vaginal exploration showed the os uteri was in a dilated condition. The foetus was found bloated and putrified. The foetus was removed after cutting it into pieces and the uterus was douched. She was given a dose of Ergot, Quinine and Acid Carbollic, and it was repeated daily for a period of 11 days. The uterus was also douched with Lysol lotion every third day. On 7th May 1931, she was discharged cured. The photograph of the goat is attached for illustration.

Remarks:—The high resistance to sepsis shown by this goat is interesting.

Culled from Articles Received for Publication and from other Journals.

HYDROTHORAX IN BUFFALOES.

Mr. M. D. Vaishnava, G.B.V.C., Nadiad, Bombay, states that he had come across four cases of Hydrothorax, all in buffaloes, and performed *paracentesis thoracis* removing each time 5 to 6 pints of fluid. He followed it up with internal administration of Pot. Iodide and Tr. Digitalis. But he does not definitely state about the result of each case. He wants to know if this is a common disease.

PRESCRIPTIONS.

Mr. K. A. Khan, Veterinary Assistant Surgeon, Sikandarabad, sends us the following interesting prescriptions which he says are in daily use with him and claims "cent-percent-cure" if used in the early stages of the disease.

1. *Tympanitis in Cattle*: Chlorinated lime 1 to 3 drams.
Aqua—10 ounces.
2. *Impaction of rumen*: Aloin—1 to 3 drams.
Aqua—10 ounces.
3. *Rinderpest*: Black pepper—2 drams.
Pure ghee—2 lbs.
4. *H. S. in Cattle in early stages*: Alum—2 drams.
Milk—1½ lbs.
5. *B. Q. in Cattle in early stages*: Human burnt bones—4 drams.
Milk 1½ lbs.
6. *F. & M. Disease*: Decoction of Accacia bark—2 lbs.
Alum—1 ounce.
To be applied to the lesions in the feet and used as gargle also once daily.

FOREIGN BODY IN THE HOOF OF A PONY.

Mr. Nanak Chand, G.P.V.C., Veterinary Surgeon, Jatoi, Punjab, records of a case of a foreign body lodged in the wall of the hoof of a pony. It was a hard thorn of date palm tree about one inch and a half long. It led to slight suppuration and the thorn was located and removed.

NORMAL SALINE SOLUTION IN VETERINARY PRACTICE

Mr. G. V. Dadhe, G. B. V. C., Demonstrator in Veterinary Science, Agricultural College, Poona, Bombay, records success with Normal Saline Solution as a douche in all cases of acute inflammation of the mucous membrane; enema with Normal Saline Solution in cases of Dysentery in dogs; and injections of 2 to 4 c.c. of Normal Saline Solution into the folds of conjunctiva in cases of conjunctivitis.

CONTROL OF HÆMORRHAGE AFTER DEHORNING

We have just read the article, "Dehorning," by Doctor Ferguson, in the December, 1931 issue of VETERINARY MEDICINE, and note that he uses and recommends "wooden pegs or matches driven solidly into the horn foramina to stop the profuse post-operative hæmorrhage."

Some years ago we were reminded (Sisson) that blood supply of the horn is chiefly from a branch of the superficial temporal artery which passes around the outer side of the base of the horn-core, supplies the matrix of the horn, and anastomoses across the back of the frontal eminence with the artery of the opposite side. With these facts in mind we were able to control all hæmorrhage by the simple trick of passing double binder twine or fodder twine about the horn bases, rather low, to exert adequate pressure on the arteries tying firmly either forward or back of the frontal eminence. To increase this pressure the strings, forward and back of the frontal eminence may be brought closer together by passing other strings beneath them—about three inches from the horns—and thus take up all slack by tying up over the frontal eminence. If this pressure is properly placed before, or after, using the dehorning shears there is no appreciable hæmorrhage. The pressure strings will not be cut in the operation even though an inch of the haired skin is removed with the horn as it should be.

After two hours the owner cuts these pressure strings with shears. Why the shears? Because he is less likely to cut himself.

Veterinary Medicine, Vol, XXVII, No. 3.

STRANGULATED HERNIA IN A STALLION

Early one morning, I was called to the fairgrounds to treat an aged, but valuable racing stallion. He had been jogged on the track and came in exhibiting colicky symptoms, pawing, stretching, lying down and rolling on his back, with his feet against the side of the box.

I suspected a strangulated hernia, and noted that one side of the scrotum was enlarged. The horse had very large heavy testicles, and jogging had dragged the small intestine or the omentum into the inguinal canal.

Frequently I castrate ruptured pigs by doing the so-called covered operation after forcing the intestine back into abdominal cavity by merely twisting the testicle until the hernia is reduced, then tying it and removing the testicle in the ordinary manner of the covered operation.

When this stallion was cast and prepared for operation, I decided to try this method of reducing the hernia, and twisted the testicle in the side of the scrotum that was enlarged. To my surprise, the horse was immediately relieved and no cutting or other treatment was required. There has been no recurrence of the condition since.—W.V.P. New York.

Veterinary Medicine, Vol. XXVII, No. 3.

THE TREATMENT OF OPEN JOINT

While at College in 1906, M. Dauvois was instructed by Professor Cadiot to treat an open fetlock joint of a light cart-horse by injecting the fistula with oil and biniodide of mercury. Finding difficulty in introducing the mixture through the joint discharging synovia, with a Pravaz needle, he punctured the posterior *cul de sac* of the synovial membrane between the metacarpus and the suspensory ligament and readily injected the joint, some of the oil escaping by the fistula. The escape of synovia stopped, but as a result of the irritation there was pseudo-ankylosis and the patient left the College permanently lame. Being equally unsuccessful afterwards in several similar cases with injection of various antiseptics, he abandoned this method. In July, 1929, having a case of open fetlock joint, he injected five drams of lacto-serum (whey) into the posterior *cul de sac* of the joint synovial membrane. A rapid cure resulted and eight days later the animal was put to work. He himself and several of his confreres have had like happy experiences.

Another case is reported in which a harrow-pin entering the back of the pastern, perforated the flexor tendon and entered the sesamoid sheath. The joint was not involved. Puncturing the

tense synovial sac in front of the perforans, ten drams of lacto-serum was injected through the Pravaz needle, some of the liquid escaping by the wound below. Next day an ounce of lacto-serum was injected and now none escaped by the wound and a perfect recovery resulted.

The author advises that the injection be made away from the wound as soon as possible after the injury is inflicted and repeated next day if necessary.—*Recueil de Medecine Veterinaire*, Vol. cvii, No. 9. *Veterinary Record*, Vol. XI, No. 47.

NEW PARASITE OF THE CAT

During the 74th helminthological expedition of the U.S.S.R. a new trematode of the domestic cat²³ was discovered. It belonged to the genus *Pharyngostomum*, but differed from the species *cordatum* by its size. The length is 2.3 mm. the maximal width is 1.4 mm. The diameter of the oral sucker measures 0.154 mm. of the ventral sucker 0.19 mm. a considerable difference. The pharynx measures 0.25 X 0.2 mm. The branches of the alimentary canal are much shorter and do not extend beyond the anterior border of the ventral sucker.

Veterinary Medicine, Vol. XXVII, No. 3.
23 Skrzabin, K. J. and Popoff, N. P. *Pharyngostomum Faust IV. sp. Tierarztl. Rundschau*, 36 (1930) : 709-710.

TURPENTINE INJECTIONS FOR MASTITIS

The treatment²⁶ consists of subcutaneous injection posterior to the scapula of 8 c.c., of turpentine, frequent milking of the affected quarter, destroying the milk and clean bedding. With the exception of a slight diffuse swelling, no damage to the tissues is produced.

Two of the 16 case reports follow:

No. 1. July 16, Mastitis right fore-quarter. Infection, streptococci.

Gave 8 c.c., turpentine, July 17th. Result: Cured July 21, 1930.

No. 2. September 3, Mastitis in right fore-quarter. Two days standing, almost no milk. Infection, staphylococci.

Gave turpentine as in No. 1, September 3. Result: September 9 the infected quarter still swollen and with abnormal content, but the milk flow had increased to 15 liters. September 27 gave 23 liters of milk and was completely cured.

Veterinary Medicine, Vol. XXVII, No. 3.

26 Vedel, P.; Turpentine Treatment for Mastitis; *Svensk Veterinartidskrift*, 36 (1931); 21-25, No. 1. Abstracted by O. Norling—Christensen, '32, O.S.U., Columbus, Ohio.

AVIAN TUBERCULOSIS IN A DEER

Tuberculosis of wild animals has always been considered rare except in animals that have been confined or been in contact with civilization. Especially avian tuberculosis was formerly thought to be of negligible importance to mammals. An interesting case was studied by Prof. M. Christiansen,²⁵ Copenhagen, Denmark.

A deer was accidentally killed by an automobile and the liver and spleen were given to the State Laboratory for examination for diagnosis. The left third of the liver was completely filled with nodules of the size of hazel nut to that of hen eggs. The nodules were so close together that the parenchymatous cells in this part of the organ were completely gone. The nodules showed marked fluctuation, were roundish but partly of irregular shape. Each nodule was surrounded by a rather heavy connective tissue capsule and inside this was a soft cheesy mass, which could easily be separated from the capsule and which contained numerous small granules of calcium. Cutting through the nodules, a uniform surface with concentric layers of calcium grains presented itself. Spread in the other part of the liver were some bean to hazel nut sized nodules and dorsal over in the right side a nodule of the size of a hen egg, all of the same structure.

The portal lymph gland was gone except for a little part there was calcified. In the spleen there were a number of pea to walnut sized round nodules of the same structure as the one found in the liver. Almost the entire surface of the spleen was adherent to a round fluctuated process. This was bigger than a goose egg and connected with the diaphragm.

The bacilli were typed and proved to be of the avian strain of the tubercle bacillus. This deer had been seen for several years previously in the vicinity of poultry farms on which tuberculosis was known to exist.

Veterinary Medicine, Vol. XXVII, No. 3.

²⁵ Christiansen, M. Generalized Organtuberculosis in Deer Caused by Avian Tuberculosis: *Maanedsskrift for Dyrlaeger* Vol. 43 (1931) No. 8 (81-87) Abstracted by O. Norling-Christensen '32, O.S.U., Columbus, Ohio.

ATYPICAL CASE OF DISTEMPER.

By

R. F. WALL, M.R.C.V.S., *Bayswater.*

It is rather interesting to meet with a case of distemper that does not run the ordinary course, and I think it is worth while reporting one that came to me quite recently.

The object was a Dalmatian bitch, about 18 months old. Except for two or three fits when she was about four months old she has been in the best of health and condition, and there is no history of cough or diarrhoea. She was vaccinated against distemper at five months old, and 12 months later she was sent to me for the reason that it was believed she had some ear trouble. There was an occasional shake of the head and twitch of the eyelids; the ears were perfectly clean and the bitch apparently in the best of health beyond the symptoms mentioned. The owner was notified that the condition was due to nervous trouble and advised to let her remain under observation.

The twitching of the ears and eyes increased in frequency and force until there was well-marked chorea of the head and neck. During this time, about eight days, she appeared to be quite well and took her food avidly. She then developed a slight cough and her appetite was not quite so good. The temperature rose to 106° F., catarrh was exhibited, the cough became more frequent and diarrhoea ensued; in fact, all the usual symptoms of distemper involving the nervous system were reversed. The mucous membrane of the nose underwent considerable necrosis, and it was over seven weeks before recovery was apparently complete. So far there has been no recurrence of nervous symptoms, and to the best of my knowledge she is perfectly well. The serum used in treatment was supplied by the Institute, Serotherapique, Gembloux.

"The Veterinary Record" Vol. XII, No. 10.

Notices of Drugs.

SULFARSENOL IN THE TREATMENT OF PIROPLASMOSIS.

EXTRACT FROM

L'ARSENOTHERAPIE EN MEDECINE CANINE PAR LE
"SULFARSENOL".

This parasitic infection of the blood, caused by "Piroplasma Canis" is chiefly propagated in marshy or very wet districts of countries. It appears more or less frequently and with a varying seriousness according to the years. It is common towards the end of summer and especially so after the rainy season. Humid heat is in fact propitious to the evolution of dog Ticks.

In Paris, the infection appears only periodically and rather irregularly in subjects which have been infected during a voyage or during a hunt.

The propagation of the disease is caused through the medium of ticks, the Dermacentor Reticularis and the Rhipicephalus Sanguineus especially through which are disseminated the Piroplasma Canis. The Rhipicephalus Sanguineus is very frequently met with in the middle of France.

The evolutionary stage of the Piroplasma is still only imperfectly revealed; the chief things are known, however.

We know that this affection appears in two forms:—

1. Acute Piroplasmosis with an incubation period varying from 5 to 35 days—quickly fatal.
2. Chronic Piroplasmosis somewhat resembling acute but with symptoms much less accentuated; there appearing only an intensive anemia accompanied by muscular weakness.

In the acute form, diagnosis is easy from clinical signs, but it is better to confirm it by microscopic examination. In chronic and lingering forms the Piroplasmae which are few, often escape notice in microscopic examination and diagnosis remains undecided.

The principal treatment consists first of all in the destruction of the parasite, then in the use of tonics and reconstructives with appropriate hygiene.

Up to now, cure by the destruction of the parasite was brought about by "Trypan blue", but cure was effected only when treatment commenced at the onset of the disease. This medicament was injected either intravenously or hypodermically in a 1% solution and dose of 1 to 4 cmc. At the same time it was necessary to give injections of serum, caffeine and cacodylate of sodium to allow the

organism to overcome the intensive anemia which is the result of the destruction of the hematocytes by the piroplasmae.

But practitioners who use "Trypan blue" know its serious inconvenience; when the animal is cured the ocular and labial mucus and all the tissues in general are the seat of a pale blue colouration which persists sometimes for 2 to 3 months in the ligaments and aponeurosis.

We shall no longer lay stress on this defect, less important in Canine medicine than in Bovine medicine, where the utilization of "Trypan blue" owing to its colour persisting in the tissues, renders after a time the animal treated, unfit for consumption.

To contend against this serious affection, we prefer using Sulfarsenol which is very efficacious and which has none of these inconveniences. We have tried Sulfarsenol in more than 20 cases which were brought to us, and all of them were quickly cured. Indisputably it is the treatment of choice. This arsenobenzene which is an energetic bactericidal has a very marked action on the hematozoa: it quickly destroys the Piroplasma even when it is completely developed and renders the subject free from the parasite in a few days.

Moreover, it is well tolerated and there follows no colouring action on the tissues. In addition, its reconstructive power and that of producing leucocytes add to these advantages.

From among the 20 cases mentioned above, the three following observations are quoted:—

Case No. 1, three years old was brought to our consulting rooms on June 20th, 1924. The animal was lean, very weak and had no appetite. It showed symptoms of discomfort and signs of paralysis in the hind quarters; the mucus was very pale the pulse was scarcely perceptible, and the temperature was 37°. Micturition was infrequent and the urine extremely deep in colour—in fact almost black. The owner told us that the animal had been covered with ticks 15 days previously. Microscopic examination of the blood confirmed our diagnosis of Piroplasmosis. The case was very serious and treatment was at once commenced with Sulfarsenol. The patient received the following intravenous injections:—

On 20th June	6 centigrammes Sulfarsenol
„ 21st „	10 „ „
„ 22nd „	12 „ „
„ 24th „	18 „ „
„ 26th „	20 „ „
„ 28th „	24 „ „
„ 30th „	30 „ „

On June 21st the temperature rose to 38° but the animal refused all food. On 22nd June micturition was more frequent and the

urine less coloured, the pulse was distinctly perceptible and the temperature was 38.8°. The patient lapped some milk of its own accord and was steadier on its hind legs. On the 24th, the dog was brighter and had regained its appetite. Improvement continued. On the 26th June the animal commenced to get fatter and the mucus again became more coloured. On the 28th, cure was effected. Microscopic examination of the blood taken on the 15th day of treatment, revealed no piroplasma. The animal which we saw a year afterwards was in the best of form.

Case No. 2, a French Spaniel, aged two years was brought to our clinic on November 5th. It was very weak and could scarcely stand on its legs which were œdematous up to the upper part of the limbs. The mucus was very pale and slightly coloured yellow—the ocular spheres partly covered with a film were motionless: the pulse was imperceptible and the urine coffee coloured. The heart was extremely weak: temperature was 36.2°. Examination of the skin revealed the presence of a very large number of ticks chiefly on the ears, the breast and dorso lumbar region.

The diagnosis of Piroplamosis was confirmed by microscopic examination. As the case was considered almost hopeless, we suggested to the owner that we would experiment with Sulfarsenol treatment which was at once commenced.

The patient, almost at the point of death, received the medicament by the intravenous route; at first two injections of small doses were given the first day, when the following doses were given on the other days.

On November 5th, the first intravenous injection of 3 centigrammes was given in the morning and 2nd intravenous injection of 3 centigrammes was given in the evening.

6th November in the evening	3rd injection (intravenous)	0.06 cg.
7th " " " "	4th " "	0.10 "
8th " " " "	5th " "	0.10 "
10th " " " "	6th " "	0.12 "
12th " " " "	7th " "	0.18 "
14th " " " "	8th " "	0.24 "

In order to sustain the heart and to contend with the complete exhaustion, the patient received during the first five days 25 grammes of physiological serum and 20 centigrammes of caffeine. A slight improvement commenced to show only after the 3rd injection. The animal which was inert, and had no appetite started bestirring itself and drank a little milk. At the same time the temperature rose to 38° and the pulse became distinctly perceptible.

On the 5th day the dog got up and walked about a little for a few minutes. It took an interest in everything which was going on

around it. The urine still a deep colour was very abundant, the temperature was 38.5°, the pulse excellent.

On the 8th day the animal commenced to run, eat and bark; urine was normal colour, and cure was rapidly effected until on the 15th day a definite cure was obtained—to the owner's delight.

This dog which was seen six months afterwards was in excellent health.

In many cases of the same gravity, "Trypan blue" had brought about no result.

Case No. 3, a Cocker Spaniel, aged 18 months, just back from Italy was brought to our clinic on the 20th May 1925. The state of nutrition was bad, the appetite nil, pulse very feeble, and the limbs staggered while walking. Micturition was infrequent and the urine was the colour of brown beer. The labial and ocular mucus as well as the skin of the stomach and the inner part of the thighs were very distinctly coloured safron yellow. On examination of the skin numerous ticks were found amongst the hair of the ears and breast. The diagnosis of Piroplamosis was confirmed by bacteriological examination of the blood.

The case was serious considering the general weakness of the patient. We proposed to the owner to give intravenous injections of Sulfarsenol.

The patient received in the saphena the following:—

20th May	one injection of	0.06 centigrammes
21st " "	" "	0.06 "
23rd " "	" "	0.10 "
25th " "	" "	0.15 "
27th " "	" "	0.18 "
29th " "	" "	0.18 "
31st " "	" "	0.18 "

Up to the 21st May, the state of the patient became slightly worse and injections of Camphor in Oil were necessary to overcome cardiac weakness. On the 22nd the condition remained the same. On the 23rd a distinct improvement was noticed and at the same time urine was more abundant and less coloured. On the 25th May, the animal commenced to eat, its walk was more sure and the jaundiced colour of the mucus and of the skin had diminished by half.

After the 27th May improvement quickly increased, urine was almost normal colour, appetite had become excellent and cure seemed assured.

The animal which we saw after two months was in excellent form and had had no relapse.

PERNOCTON NARCOSIS FOR DOGS

BY

DR. JACOBI, Luebeck, Germany.

General anesthesia in small animals has ever been the child of many sorrows for the practitioner. Personally the author is ready to state that, so far, every anesthetic has fallen short of his expectation. And yet, anesthesia is one of the most important aids to the small animal practitioner, and one with which he cannot dispense. Calm and deliberate work is practically impossible without it. Many an operation which could be performed without narcosis is frustrated by the unreasonableness of the animal patient. For example, is it possible to extract a tooth in a full grown German Shepherd dog without previous narcosis? Emphatically not, except in a clinic with sufficiently trained personnel at hand. The same applies to appropriate splinting and dressing of bone fractures. Numerous other examples might be cited.

The principal anesthetic in canine practice is morphine, injected subcutaneously. In spite of its good points, there are also many objections against it. Objectionable is the annoying vomiting, occurring, usually, shortly after the injection. To this must be added that animal patients whine and moan for hours, leaving a rather unfavorable impression upon the owner. Finally the weakness of the hindquarters should be mentioned, occurring, as a sequel to morphine narcosis and noticeable as late as 24 hours after injection.

Chloroform and ether, used for inhalation anesthesia are likewise not very popular because they are not without danger and often the stage of relaxation is preceded by a pronounced stage of excitement. Nevertheless, in some cases the author was able to re-enforce effectively the morphine narcosis by inhalation anesthesia (chloroform and ether, equal parts). Chloral hydrate and other narcotics are little used in small animal practice, therefore, there is no need to discuss them here.

In the following, attention is called to a narcotic which the author has been using for three years in his clinic and which he has found exceedingly satisfactory. Although it is not entirely free from disadvantages, he prefers it by far to morphine. The narcotic in question is Pernocton. It is a 10% aqueous solution of a derivative of barbituric acid. The following are its essential qualities: Injected intravenously, narcosis takes effect quickly, as a rule, during the act of injection. Its action is decidedly hypnotic; its toxicity is very low. Disagreeable after effects are entirely absent. The optimal limits of action have been determined for the intravenous as

well as for the subcutaneous injection by tests on rabbits. Briefly reviewed, the following values have been found:

(a) for intravenous injection:

0.007 gm. per Kgm. liveweight, lowest limit for action.

0.025 gm. per Kgm. liveweight, sound sleep, exceeding 1½ hrs. duration.

0.040 gm. per Kgm. liveweight, narcosis of several hours duration.

0.070 gm. per Kgm. liveweight, profound narcosis of respiratory centers, endangering life.

The therapeutic latitude for intravenous injection therefore equals 10.

(b) for subcutaneous injection:

0.008 gm. per Kgm. liveweight, lowest limit of action.

0.160 gm. per Kgm. liveweight, minimal lethal dose.

The therapeutic latitude for subcutaneous injection therefore equals 20.

To Prof. Dr. Hinz (1929) belongs the merit for having introduced Pernocton into veterinary therapeutics. His experiences were very favourable. Freese (1928) mentions unfavorable results. Additional favorable results with Pernocton in dogs and cats are reported by Prof. Berg (1929), Westhues (1929) and Jordanoff (1931).

Since the intravenous injection in dogs is a rather fussy procedure and difficult to obtain, the author now employs almost exclusively, the subcutaneous injection. The narcosis is exactly of the same duration and depth as with the intravenous method except that, as one would expect, the onset of narcosis is delayed. With the subcutaneous method, experience has been shown that after 1½ to 2 hours the narcosis is sufficiently deep for the operation to be started. In every instance the narcosis obtained was of sufficient length for the completion of the operation. During intravenous injection, attention has to be paid that under no circumstances the injection be made too fast, otherwise unpleasant secondary manifestations will result, such as excitement, shock, etc. The duration of intravenous injection should occupy at least two minutes in order to guard against untoward sequelæ.

During the Pernocton-narcosis the dog sleeps peacefully and soundly. The author has checked carefully the heart activity in many cases and found that it remained entirely uninfluenced, either before, during or after narcosis. Respiration is mostly deep and ample. In isolated cases, superficial respiration and intermittant respiration (Cheyne-Stokes respiration) has been observed without the detection of any subsequent harm from it. Awakening is mostly

characterized by a prodromal symptom of slight uneasiness. Immediately afterwards the animals are again entirely lively and sprightly; they partake of water and food and act as if nothing has happened. The average duration of narcosis is from 8 to 12 hours.

Ever since 1928, the author has employed in his clinic both the intravenous and the subcutaneous method. In either case the amount of Pernocton injected was 0.03 gm. per Kgm. liveweight. One c.c. of the injection fluid contains 0.1 gm. substance. Thus the amount necessary for a specific case may easily be computed. For instance, a German Shepherd dog weighing 30 Kgm. will require for narcosis 30×0.03 gm. that is 0.9 gm. substance. Since 1 c.c. contains 0.1 gm. Pernocton, consequently the amount to be injected corresponds to 9 c.c. of the solution. By the aid of this calculation, the author was able always to get complete narcosis of sufficient depth. In the following a small selection of cases is offered, that the reader may form an opinion as to the extent and gravity of the operations in which Pernocton gave complete satisfaction as a narcotic.

Case 1. French Bull terrier, female, 12 Kgm. had given birth to two whelps. Another whelp presented itself in the passage, but owing to its large size, caused dystokia. The author was consulted by the owner and advised Caesarian section. The owner consented; the dog was given 4 c.c. Pernocton solution subcutaneously. Deep narcosis resulted in $1\frac{1}{4}$ hours, so that the operation could be performed. One dead and one living puppy were extracted. The bitch awoke after 12 hours sleep and made an uneventful recovery.

Case 2. German Shepherd, eight months old, weighing 22 Kgm. Pressure fibroma on the lateral hock joint, size of pigeon egg. The dog was given 6.5 c.c. Pernocton solution subcutaneously. An hour later he was soundly asleep and ready for the operation. Awakening eight hours later.

Case 3 German Shepherd dog, weight 30 Kgm. Carcinomatous tumour on the penis. A subcutaneous injection of 9 c.c. Pernocton was given. Deep narcosis followed in $1\frac{1}{2}$ hours. The operation proceeded without further aid. The dog awakened after 10 hours and was lively and spry.

Case 4. St. Bernard, male, weight 51 Kgm. Fracture of the left upper canine tooth. Wound of the jaw. The dog was given 15 c.c. Pernocton and was asleep two hours later. The operation was performed. The patient awakened after about 10 hours.

Case 5. Black and tan terrier, weight one Kgm. Fracture of the left forearm. The terrier was very alert and lively. It was a foregone conclusion that the fracture could not be reduced properly without narcosis. The animal received $1\frac{1}{3}$ c.c. Pernocton subcutaneously. Sleep occurred after about one hour and lasted for 10 hours.

During this time splint dressing was properly applied and saturated with sodium silicate.

Case 6. Wirehaired terrier, weight eight Kgm. Accidentally shot during a hunt. The terrier received 2.5 c.c. Pernocton subcutaneously. Deep sleep followed in one hour. The animal rested perfectly quiet without any restraint. The operation was commenced. During the operation it is found that complication existed with severe intestinal and kidney lesions. The prognosis was changed to unfavourable and the patient painlessly destroyed with permission of the owner.

Summarizing it may be stated: Pernocton is an excellent narcotic for small animal practice. The anesthesia is of sufficient depth, so that it is unnecessary to employ supplementary narcotics. The duration of anesthesia is from 8 to 12 hours. It is far superior to morphine, because vomiting does not occur, moaning and whining are likewise absent as is also the feebleness of the hindquarters. The unpleasant effects of Pernocton sleep pass away much quicker, and after awakening from the sleep the animal seems to be well and hearty. The narcosis by the subcutaneous method sets in at about the same period after infection as does morphine narcosis. If a prompt and profound narcosis is required, then the Pernocton should be given intravenously. This much is certain the author prefers Pernocton far above morphine and would not care to be without it. One slight disadvantage should not be concealed: In most cases Pernocton narcosis is more expensive than morphine narcosis, but if it possesses immense advantages will its cost play a role in surgical dog practice?

Authorised translation from "Tierärztliche Rundschau" 37: 331-332 (May 10, 1931) by Fritz Volkmar, Columbus, Ohio.

Notes.

As we are getting this issue of our Journal out of the Printers' hands, comes the happy news that the Government of Madras have after all opened the Serum Institute! Better late than never. Mr. K. Kylasam Ayyar is appointed Superintendent of the institute. We offer our hearty congratulations to Mr. P. T. Saunders, Director of Veterinary Services and to the Madras Government. We hope to comment on this in our next issue.

We could only advise those concerned that nothing should be stinted in making that institute an ideal one. It must be broad

based, liberally equipped and efficiently run. We know Madras will rise equal to the occasion.

Mr. P. M. Narainswamy Naidu, B. Sc., L. V. P., who is now at Leipzig studying advanced Bacteriology and Serology under the renowned Professors Haupt and Klimmer, as a Mysore State Damodardas Scholar, has recently been offered the Second Parlakimedi Scholarship by the Indian Research Fund Association. Mr. Naidu had a distinguished university career as a student of Chemistry at Bangalore where he gained the Sir Tukoji Rao Holkar III Scholarship. After graduation (B. Sc.) he joined the Punjab Veterinary College, Lahore, the premier veterinary institution in the East as a Mysore State Veterinary scholar. He had a number of distinctions there topping the list in practically every examination and winning many prizes and medals and above all the good will of all his professors. In 1930, he took his L. V. P., Diploma and joined the Mysore State Veterinary Service, wherefrom he proceeded to Germany in 1931, for higher studies in Veterinary Science.

This distinction is the first of its kind for an Indian Veterinarian and much of the credit in this connection is due to the Lahore Veterinary College where he obtained his sound professional education and to the Mysore Government which soon recognised in Mr. Naidu great potentialities and provided the necessary funds.

We offer our hearty congratulations to Mr. Naidu and wish him every success.

On the 18th February 1932, Professor P. G. Malkani, B.A. (Hons.), B. Sc., (Lond.), M.R.C.V.S., delivered a lecture in connection with his discovery of the cause of Nasal Granuloma in Cattle. He dealt with the nose string and actinomycotic theories and pointed out the objections to these theories. By a series of lantern slides, he showed the Sections of Schistosomes in the sections of tissue from the nose, the presence of actual parasites in the mixed growths and lastly the characteristic spindle shaped eggs and ciliated embryos in cover glass preparations of the nasal discharge from affected animals. He came to the conclusion that Nasal Granuloma was a form of Schistosomiasis, the species of Schistosome responsible for the condition being probably *Schistosome spindalis*, Montgomery 1906.

We congratulate Prof. P.G. Malkani, B.A. (Hons.), B.Sc. (Lond.), M.R.C.V.S., on his new findings. It now makes it clear why the malady responds to Antimony Treatment. If the finding is correct,

it is plain why many workers could not transmit the disease direct. It is possible, however, for a fungus to invade such damaged tissues and this perhaps led many into classifying this as a mycotic disease.

An esteemed correspondent has sent us for publication an account of improved course of study introduced at the Kansas State College of Agriculture and Applied Science, Manhattan, U.S.A. We are thankful to him for placing before our readers an idea of how things are moving in other parts of the world, in fields where we are interested as a profession.

The sheep rearing districts of Madras Presidency have suffered in recent years, very heavy losses, owing to the prevalence of many diseases both contagious and non-contagious among sheep. Variola ovina is playing its part in killing a large number of animals. Besides this there are many diseases which urgently require to be investigated into, if further losses are to be prevented.

The Civil Veterinary Department in the Southern Presidency has been working now over three decades under the guidance of imported intellect. Yet we find no proper arrangements being made to record and report the mortality among sheep, goats and poultry, even though every body in this country knows the economical value of the poor ryot in rural India. Owing to ignorance, the owners of these dumb animals do not know that the Veterinary Surgeon and the State in all the civilised countries of the world, have been helping the farmers against such losses. But it is high time the State and the Veterinary profession even in this country, realised their duty towards the benefit of such owners.

From the highest officer, namely the Director of Veterinary Services down to the lowest subordinate of the Civil Veterinary Department, have got plenty of opportunities to do something in this matter. Why? The Director is the proper authority to address the Government to arrange for the recording and reporting of the prevalence of the diseases and mortality among sheep, goats and poultry. We hope he will find his way to do this now.

Even now as matters stand, it is possible for the Touring staff to enquire and attend to the existence of such diseases and report them. We are quite conscious of the fact that these officers are over-worked, but some spade work in this direction also has got to

be done by them if they want to earn and maintain a good name for this infant profession in the country.

The new Director of Agriculture in Madras, Mr. S. V. Ramamurthy, M.A., I.C.S., has begun his career in the Department in right earnest. He is seen already in the midst of one Conference or another addressing large gatherings of people, drawing their attention to the Agricultural needs of the country in the light of modern scientific advancement. His intimate knowledge of this country and her needs, his earnestness to do his utmost to the poor ryot, should become an example to officers at the head of analogous departments meant to develop the economic conditions of this country.

Anti-rabic treatment is given free to the people who are too poor to pay for it, Local Bodies having agreed to pay the expenses in such cases. In the case of animals, whether of the rich or of the poor the owner has got to pay for their anti-rabic treatment. Many cases have come to our notice where poor man's animals stood in urgent need of anti-rabic treatment, but these were denied it owing to their inability to pay at the rate of Rs. 20 - and above per head of cattle. Not only such animals die a miserable death but they are a source of potential danger to both men and animals in the surroundings. We invite the attention of the Veterinary authorities to this important matter, so that they may devise some means of giving relief to the poor owner and his animals.

The Veterinary dispensaries at Battavaripalle, Kandakur, Sivakasi and Udipi have been closed for good from the beginning of this month, as a measure of retrenchment, as the attendance at each of these institutions did not go beyond 10 daily. Since there are places in the country which stand in urgent need of Veterinary institutions, the right course would have been to transfer the above institutions to some other places. No doubt, the State has gained by this measure of retrenchment a few hundred rupees, but this may mean to the poor agricultural community a loss of thousands of rupees.

We understand four or five touring billets have also been abolished in Madras, Civil Veterinary Department in the name of Retrenchment. Our remarks in the previous para apply to this step with even greater force. Cannot this be considered as a retrograde step of a Development Department?

Thirty nine fresh Graduates have come out successful in the recent Diploma Examination held in the Madras Veterinary College in March last. We offer our hearty congratulations to them on their success in the examination, but we also sympathise with them because they have to face the giant "unemployment" because the State cannot find funds to employ them for work in the department.

If there was a justification for having increased the number of inspecting staff in the department, there is obviously greater justification to-day to equip and staff the institutions on more up-to-date lines.

Association News.

REPORT OF THE ANNUAL GENERAL MEETING OF THE BOMBAY VETERINARY GRADUATES' ASSOCIATION.

The Annual General Meeting of the Bombay Veterinary Graduates' Association was held at the Gokhale Education Society's Hall, Patel, on Saturday the 26th December 1931, at 3 P. M.

The following members were present:

- | | |
|-------------------------|---------------------------|
| 1. Mr. M. G. Kulkarni | 13. Mr. S. B. Hanchilikar |
| 2. " N. K. Barshikar | 14. " D. B. Sapre |
| 3. " Y. N. Marathe | 15. " V. K. Chatuphale |
| 4. " M. K. Garudacharya | 16. " K. R. S. Ayer |
| 5. " M. Mohey-Deen | 17. " A. H. Khan |
| 6. " D. S. Laud | 18. " V. R. Phadke |
| 7. " P. B. Cardmaster | 19. " S. J. Khambate |
| 8. " R. G. Sathe | 20. " P. C. Bapat |
| 9. " P. G. Date | 21. " H. N. Chatre |
| 10. " C. S. Phadnis | 22. " R. L. Jaigaonkar |
| 11. " K. Kandade | 23. " G. A. Washikar |
| 12. " J. G. Gokhale. | |

Dr. D. N. Jejurikar, who happened to be in Bombay, attended the meeting.

As Khan Sahib N. D. Dhakmarwala, President of the Association could not attend the meeting, being out of Bombay, Mr. D.S. Laud, G.B.V.C., F.Z.S., Superintendent, Victoria Gardens, was elected to the Chair.

The Annual report of the Managing Committee and the Presidential address of Khan Sahib Dhakmarwala were read by the Chairman Mr. Laud. The report stated that there were 136 members on

the role at the beginning of the year and 133 at the end of the year thus decreasing the number by 3. During the year under review the total receipts amounted to Rs. 451-8-10, which when added to the balance of the last year viz. Rs. 1023-1-9, amounted to Rs. 1474-10-7, and the expenditure was Rs. 403, thus the balance at the beginning of the current year was Rs. 1071-10-7.

The minutes of the last Annual Meeting were read and confirmed.

The following interesting and instructive papers were read by the following members:—

1. By Mr. N.K. Barshkar, G.B.V.C., Veterinary Assistant Surgeon, Ahamadnagar, on "A case of urethral calculi in a bullock".
2. By Mr. D.S. Laud, G.B.V.C., F.Z.S., Superintendent, Victoria Gardens, on "An interesting case of Epilepsy in tiger".
3. By Mr. D. B. Sapre, G.B.V.C., Veterinary Assistant Surgeon, Malegaon, on "Extra-uterine gestation".

Lively and interesting discussion took place on the papers read.

The following resolutions were passed:—

1. Resolved that the present name of the Bombay Veterinary Graduates' Association be changed to the Bombay Veterinary Medical Association.
Proposed by Mr. M. Mohey-Deen.
Seconded by Mr. K. R. S. Ayer.
2. Resolved that a Sub-committee of the following members viz. Messrs. Mohey-Deen, Phadke, Laud and Date be appointed to consider and report to the Managing Committee within 4 months as regards the advantages of registering our Association under the Indian Company's Act, if funds permit.
Proposed by Mr. Y. N. Marathe.
Seconded by Mr. R. G. Sathe.
3. Resolved that the Annual Subscription should be reduced to Rs. 2 from Rs. 3.
Proposed by Mr. Cardmaster.
Seconded by Mr. R. L. Jaigaonkar.
4. Resolved that the following members should be the Office bearers for the year 1932:—

President:—Khan Sahib Dhakmarwala.

Jt. Hon. Secretaries:—Mr. P.G. Date and Mr. M.K. Garudacharya.

Hon. Treasurer:—Mr. Y.N. Marathe.

Members of the Managing Committee. { Mr. K.R.S. Ayer
„ M. Mohey-Deen
„ P. C. Bapat
„ S.B. Hanchilikar
„ N.K. Barshkar.

Auditors:—Mr. P. B. Cardmaster and Mr. R. L. Jaigaonkar.

5. Resolved that a sum of Rs. 10. be paid to the Gokhale Education Society as donation.
6. Resolved that a vote of thanks be passed for the retiring Managing Committee.
7. Resolved that the Principal of the Gokhale Education Society's High School, Parel, be thanked for allowing us the use of the hall for the Conference.
8. A resolution recording complete confidence in the members of the retiring Managing Committee and Office-bearers and repudiating certain allegations made against them was also passed.

A vote of thanks to the Chairman terminated the meeting.

College News.

MADRAS VETERINARY COLLEGE.

A list of successful candidates who graduated from the College in 1932, arranged in the order of merit.

- | | |
|----------------------------|--------------------------|
| 1. Belliappa, K.C. | 21. Shaik Abdul Khader. |
| 2. Mahalingam, M. | 22. John, M. |
| 3. Sivaramakrishnan, T.K. | 23. Shamaraya Shetty. |
| 4. Bharadwajan, C. | 24. Ramanujam, Y. |
| 5. Ayyappa, A.P. | 25. Rama Rao, K. |
| 6. Muhammad Mustaffa | 26. Nagabushanam, K. |
| 7. Sethupathi, L.R. | 27. Thulasiram Singh. |
| 8. Gopalakrishna Rao, Y. | 28. Chakko, M.M. |
| 9. Muhammad Ismail. | 29. Thirumalaswamy, C.T. |
| 10. Viswanatha Menon, T. | 30. Jagannathan, M. |
| 11. Seetharamaswamy, P. | 31. Venkoba Rao, B.S. |
| 12. Kuppuswamy, N. | 32. Seetharama Rao, V. |
| 13. Ayyaswamy, T.S. | 33. Natarajan, T.A. |
| 14. Gangadharan, R. | 34. Poornabodha Rao, M. |
| 15. Madhava Menon, V.K. | 35. Venugopal Rao, V. |
| 16. Seshagiri Rao, B. | 36. Neelakantan, R. |
| 17. Venkataraman, S. | 37. Subramanian, D.V. |
| 18. Venkata Rao, S. | 38. Arumugam, G.K. |
| 19. Purushothama Rao, B.S. | 39. Ahmed Hussain. |
| 20. Muhammad Barkatulla. | |

Nine students have failed.

In Class-B, 21 students out of 31 have passed. Out of the 10 failed candidates, 7 will appear for the supplementary examination in June 1932.

In Class-A, 34 students out of 46 have passed. Out of the 12 failed candidates 6 will appear for the supplementary examination in June 1932.

BENGAL VETERINARY COLLEGE. 1931-1932.

The undermentioned students have passed the diploma examinations in the order of merit. (Final year).

Serial No. No. in order of merit.	Name.	Serial No. No. in order of merit.	Name.
1	H. R. Arora	19	A. A. Khan
2	A. M. Ayer	20	Q. D. Ezzet
3	A. A. Gilder	21	S. G. Mukherjee
4	P. C. Dutt	22	R. B. Singh
	Mazumdar	23	A. Singh
5	M. Ahmed	24	Md. D. Hossain
6	M. C. Mitter	25	D. K. Chakravarti
7	H. S. Rathore	26	S. S. Rathore
8	F. N. Chatterjee	27	H. M. Dutta
9	K. L. Mukherjee	28	A. K. Tarafdar
10	M. D. Habib	29	S. C. Roy
11	K. C. Assi	30	S. H. Quidwai
12	Z. S. Talib	31	P. Krishnamurti
13	K. K. Roy	32	P. K. Nair
14	K. R. Pella	33	G. K. Chowdhury
15	B. P. Trivedi	34	H. C. Joshi
16	F. Mahammad		
17	M. Mushain Ali		
18	S. K. Bhaduri		

BENGAL VETERINARY COLLEGE.

1931-32.

The following students have passed in class B, in the order of merit.

Serial No. No. in order of merit.	Name.	Serial No. No. in order of merit.	Name.
1	B. Chowdhury	15	M. Ali
2	W. R. Bashoo	16	S. M. Khayat
3	N. N. Sharma	17	R. L. Thomas
4	K. V. N. Rao	18	K. M. Afsaruddin
5	F. M. Meshak	19	J. S. Gupta
6	H. S. Ramaswami	20	S. B. L. Kackrania
7	Y. H. Sarrah	21	M. Farooq Ali
8	S. M. Bose	22	P. S. Dhandial
9	B. N. Chatterjee	23	B. R. Krishnaswami
10	M. Y. Muallem	24	P. K. Bose
11	M. S. Chatterjee	25	M. L. Varma
12	T. Panikar	26	H. A. Auquati
13	P. S. Nair	27	S. K. Sharma
14	C. M. Hassan	28	

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BENGAL VETERINARY COLLEGE

1931—32.

The following students have passed in class A, in the order of merit.

Serial No.	No. in order of merit.	Name.	Serial No.	No. in order of merit.	Name.	
1	1	U. Tun Ung	492	33	P. J. Itoop	410
2	2	C. G. Kurian	490	34	P. V. Panikar	405
3	3	R. D. S. Iyengar	485	35	B. Shome	400
4	4	W. S. Jibrail	484	36	T. B. Mukherjee	400
5	5	S. R. Guha	483	37	P. M. Cheru	398
6	6	K. G. Pillai	480	38	U. L. Mazumdar	397
7	7	P. B. K. Pillai	476	39	K. I. Alexandar	395
8	8	S. M. R. Naqvi	474	40	N. G. Rama Rao	395
9	9	A. S. Khan	474	41	K. G. S. Rathore	390
10	10	T. T. Vergheese	466	42	S. N. Sen	385
11	11	S. Ram Chandra	460	43	Alfons Roy	383
12	12	Y. L. Narasimha Rao	460	44	S. K. Tun	380
13	13	J. S. Navaratnam	458	45	K. A. Raja	380
14	14	D. N. Murti Rao	457	46	K. M. N. Rajan	378
15	15	C. K. Ipe	455	47	Md. M. Hoque	375
16	16	S. M. H. Naqvi	450	48	K. L. Dey	370
17	17	L. K. Bose	450	49	A. V. D'Cross	365
18	18	T. S. Nathan	445	50	A. M. Reddi	355
19	19	M. N. Molasi	445	51	V. Sahadevan	350
20	20	A. S. Murti	442	52	Rama Rao	345
21	21	B. S. Bans	440	53	C. M. Sen Gupta	340
22	22	A. V. Srinivasa	436	54	S. K. Gupta	335
23	23	V. C. Zacharia	435	55	T. Srinivasa Sastri	335
24	24	K. Srirangchar	433	56	P. S. Kujur	330
25	25	A. K. Mukherjee	428	57	S. S. Hossain	330
26	26	K. J. Simon	425	58	A. M. S. Haque	330
27	27	C. K. Acharia	425	59	Gazi F. Rahaman	325
28	28	C. V. Tharappau	420	60	S. M. Mukherjee	320
29	29	A. K. Dutt	420	61	P. K. Tharu	310
30	30	K. R. S. Ramaswami	418	62	B. M. Chowdhury	300
31	31	S. Achyut Rao	415	63	K. S. Khara	295
32	32	R. R. Raju	415			

Correspondence.

THE EDITOR,

The Indian Veterinary Journal, Madras.

Sir,

On page 288 of the *Indian Veterinary Journal*, January 1932 issue, Volume 8, there appears a letter of inquiry written by Mr. G. R. Khan, G.B.V.C., as to an article on Volvulus of the Intestine—written by Mr. Prem Nath Kak which appeared in the April number, Volume 7 of the *Indian Veterinary Journal*. Dr. Khan asks for information on the subject—His description of the existing condition in volvulus is absolutely correct, as proven by many years of research on my part. All veterinary practitioners are familiar with the striking symptoms of intense excruciating pain of the patient at the beginning of the manifestation of the twist of the gut—the carefulness with which he throws himself on the ground. While these symptoms are markedly noticeable they do not suffice to lead to a correct diagnosis. There is, however, a pathogenic symptom which develops early in the case usually and is diagnostic. When a volvulus occurs in the horse or mule the inflammatory process is rapid—requiring only a few hours to pass through its different phases and terminate in gangrene and death. In the early stages—the congestive—the fluids are poured into the bowel and collect at the point of the twist—between stomach and twist (most cases of volvulus are in the small intestines about three feet from the stomach). When this has taken place and the patient lays himself down (especially if he rolls over), the attending practitioner by carefully listening will hear a muffled slashing sound like water in a half filled rubber bag. To acquaint yourself with the sound fill a rubber hot water bag half full of water and manipulate with your hands or toss it on to a bed and roll it about. This procedure will give a correct idea of the sound—one which never occurs in any other disease and which disappears when the twist is untwisted. The writer has attended cases in whom this noise was very pronounced for two or three hours until death and the post-mortem proved volvulus of small intestine. Again in cases when the noise was pronounced it disappeared and the patient ceased to exhibit pain and made a rapid recovery. The case reports are not isolated ones. My experience covers many years of active practice. Opium and its derivatives—arecolone—physostigmine—pilocarpine—nux vomica—ether—aloes—linseed oil, etc., are contra indicated. To me such agents in cases of intestinal obstructions mean signing the death warrant.

Alleviate pain with the intravenous, muscular or subcutaneous injections of magnesium sulphate (epsom salts) for a general anaesthetic of 10 to 40 c.c. of a 20 per cent., sterile solution. To relieve the volvulus give as a drench pure glycerine in a wide mouthed drenching bottle to allow the glycerine flow easily, in quart or two quart doses. No limit as to quantity of glycerine that can be given. (The greater the quantity within reason the more apt you are to obtain satisfactory results). Its reaction is hygroscopic and mechanical—as it were—no constitutional effects follow the use of it. When glycerine is applied to an oedematous area it quickly relieves the tissues of fluids. In this way combined with its weight it untwists the volvulus. The patient should be left at liberty to roll—place in a lot or a very large stall. I have seen an animal roll over on his sternum and in a few minutes get up relieved—recover—when all symptoms spelled volvulus. This of course was in the outset of the case. There is little hope for recovery when the gangrenous state develops.

Yours faithfully,

MACON, }
February 25th, 1932. } JOHN RUTHERFORD ANDERSON, D. V. S.

THE EDITOR,

The Indian Veterinary Journal, Madras.

Sir,

It is gratifying to learn that the Kansas State College of Agriculture and Applied Science, Manhattan, U. S. A., has approved the institution of a five-year course in Veterinary Medicine instead of the present four-year course and also two six-year combination courses of study in their Division of Veterinary Medicine. The details of the studies are given in the *Veterinary Alumni News*, dated January I, 1932, as follows:—

Upon recommendation of the faculty of the Division of Veterinary Medicine of the Kansas State College, the general faculty has approved the adoption of a five-year curriculum in Veterinary Medicine to supplant the present four-year curriculum, the change to go into effect from September 1932.

In the new year curriculum, the first year is to be known as the pre-veterinary year. It includes 30 semester hours of College credits having the following distribution:

English.	5 or 6 semester hours.
General Inorganic Chemistry.	5 to 10 semester hours.

Zoology.	5 semester hours.
Elective courses.	9 to 15 semester hours,
	30 semester hours.

It is recommended that the elective courses be selected from a modern language (German, or French), Physics, and Mathematics.

A high school graduate may enroll in this pre-veterinary year. Preferably the pre-veterinary year should be taken in the Kansas State College, because of the veterinary application given to the required courses in this institution. However, the pre-veterinary year may be taken in any approved junior college or university.

The remaining four years of the curriculum in veterinary medicine concern themselves almost entirely with the professional courses. These four years have been strengthened particularly in milk and dairy inspection, meat hygiene, as well as in poultry, pet animal, sheep, swine and cattle practice.

In the pre-veterinary year there are 30 semester credits, and in the remaining four years, 134 semester credits, or a total of 164 semester credits required for graduation.

The Kansas State College will also offer two six-year combination curricula.

The first of these is the six-year combination curriculum in Animal Husbandry and Veterinary Medicine, leading to the two degrees, Bachelor of Science in Agriculture and Doctor of Veterinary Medicine, and the second, the six-year combination curriculum in General Science and Veterinary Medicine, leading to two degrees, Bachelor of Science and Doctor of Veterinary Medicine.

“A Correspondent.”

Extracts.

STARVATION OF THE VETERINARY SERVICES.

OUT-OF-WAY ECONOMY

BY

S. G. NAWATHE, B.A.,

Secretary, Poona District Cattle Improvement Association, Poona.

It is an undisputed fact that agricultural revenue forms the major portion of the Government income, and in absence of which, even for a year, the Government will find it very difficult to carry on the administration. And therefore, the collection of revenue at any cost, disregarding the factor of depression becomes a paramount necessity. No wonder, then, that universal discontent prevails in the peasantry at the time of depression. The farmer must at least have some

consolation that he gets the proper return in the form of different services for the upkeep and betterment of agriculture.

The axe of retrenchment is to be applied only to the articles of luxury and not to the bare necessities of life. The very existence of a great majority of the people in India depends on agriculture, the mainstay of which is cattle. The Veterinary Department was started with a view to save the cattle from diseases and the Live Stock Department was opened to raise up good cattle. The former has run a life of about 25 years, while the latter has an existence of not more than fifteen years.

STRINGENCY FROM THE BEGINNING.

The foreigners like those from Brazil and Jamaica took cows of Kanrage and Girtpe to their own countries by special trains and steamers at a cost of Rs. 500/- each. It is indeed a matter of wonder that, after incurring so much expenditure, the animals are found quite beneficial there for the last two generations. And even though we get the same animals, each at Rs. 20/- or at the most Rs. 25/-, they are not here profitable. Who is to be blamed? This fact has, for more than a century, been knowingly or unknowingly, neglected. The Military Dairies were safely allowed to import as many animals of foreign blood as they liked and now in 1931.—very early is it not?—it was realised that the animals of foreign blood and breed cannot thrive in India. It is only for the last twenty years or so that the Government's attention has been drawn to the cattle problem but not with much zeal. The Government have placed themselves in the position of a man who thinks of the fire engine when half of the house has been consumed, and unfortunately, when the engine arrives it is found out of order and fire has its own way. A few veterinary dispensaries have been opened and some breeding farms have been started as a simple beginning. And yet it has not been any how possible up till now, strange as it may seem to some, to raise the number to such an extent as would make it possible for the country with a population of thirty five crores, to have a pure breed of at least two or three thousand animals or a dispensary for every twenty five thousand animals! In the beginning it was a general belief that whatever the Government did must be in the interest of the people and the public workers did not think it necessary to look into the matter, it being understood that the sole responsibility lies with the Government. But judging the exact situation and the attitude of indifference on the part of the Government, I cannot but think it wise to shatter the shackles of secrecy. Never, in fact, will it be deemed prudent to give the cattle and agriculture a go-by. I personally have occasions to observe veterinary and breeding facilities offered to animals in chief parts of Gujarath, Kathiawar, Maharastra and the Karnatak. The veterinary department is still in infancy, and its utility to the public depends upon its rapidity of growth, which will take at least not less than twenty years. There ought to be many improvements in the department if it is to be of any real use to the villagers. This being the case, to cut down the expenditure of the department on the ground of national economy is sheer injustice, to term it mildly.

NEED OF VETERINARY KNOWLEDGE IN THE VILLAGES.

The veterinary degree-holders produced by the veterinary college describe the education given by it as unsatisfactory and imperfect. And many of them suggest that it should be included in the University Curriculum. Yet it should never be forgotten that the subject, though included in the course, must be so taught as would not only enable the students to secure services but make them spread the knowledge they got in their student life, even to the villagers. This requires to be given a serious consideration. The knowledge must prove

Starvation of the Veterinary Services

itself to be a preventive remedy to the horrible diseases. The complaint that the former is backward, ignorant and careless is simply meaningless. When we actually see the farmer taking his cow or bull over a distance of not less than ten miles for a dram of zinc oxide not worth half-anna and spending a day or two, we cannot call him careless. In village schools the farmers' children should be taxed not with a burden of unnecessary subjects which do not help him any way in his life, but rather with those dealing with breeding and improvement of cattle. But somehow or other it has been considered a necessity to call upon students to observe and study those plants and animals which are only to be seen in pictures and which are not to be met with in actual life. This state of affairs has further led to their total ignorance about animals which they everyday see and tend. It is indeed a double loss. Why should a student be not given a certificate of the completion of primary education, if he is able to keep every sort of careful record about a cow with her four calves of excellent breed? In like manner some practical elementary knowledge about the various diseases and remedies for them ought to form a special and compulsory subject in the village schools, stress should be given, not on theory, but on practical knowledge.

THE EXTENSIVE FIELD FOR THE VETERINARY.

The meagre work which is being done by the Veterinary Department has been supported and lightened by the Wadia Charities, Local Boards, and Municipalities; the responsibility whereof, however, has to be shared by the local institutions and the policy and supervision is to be administered by the Government. The Local institutions which are almost on death-bed owing to the excessive financial stringency would not hesitate to demolish the Veterinary dispensaries, if the Government would curtail the grants. Thus from the beginning such a vital department, has to directly or otherwise, face a very awkward and unlooked-for situation. Having learnt that the Government, is again going to take up the reorganisation of the department, the veterinary Service Association and the Veterinary Graduates' Association have offered some useful suggestions to the Government. To say nothing of the actual constitution, that is yet to be, of the department, I cannot but suggest that the department should be so constituted as would have more extensive practical utility. On no grounds of economy should it be deemed necessary and wholesome to close the dispensaries, to raise the medical fees, to dispense with the doctors and so forth. On the contrary the Government should as soon as possible arrange to appoint travelling men having sound knowledge of elementary vetart. They should be given a box of medicines of general application; so that these men shall be made conveniently available at most of the villages. The humanitarian associations have their inspectors in towns and cities, but these should generally be veterinary graduates or men having experience of work in the department. Annually the Government Officers have to examine vehicles, in which respect the veterinary graduates should be employed. The Pinjrapoles, the Goshalas and such other institutions should have at least for every five hundred animals a veterinary doctor, with an assistant. To be brief, all possible efforts in all directions should by all means be made to prevent the diseases from affecting the quantity or the quality of the existing lot of cattle in India.

"The Daily Dnyanprakash, Feb. 10, 1932.

THE OCCURRENCE OF BOT-FLY LARVÆ (*GASTROPHILUS VETERINUS*) IN SUBCUTANEOUS TISSUES OF THE HORSE.

BY

I. CLUNIES ROSS,

McMaster, Animal Health Laboratory, University of Sidney.

Recently the writer received from Dr. H. W. Bennetts, Veterinary Pathologist of Western Australia, an interesting specimen of four bot-fly larvæ of *G. Veterinus*, which were taken from the subcutaneous tissues in the region of the hock of a crippled yearling foal. The larvæ, which resemble three-quarter grown specimens, usually found in the stomach, even after fixation, appear to be firmly attached to the connective tissue by their mouth parts.

The finding is of particular interest in regard to this species, since at the present time there is some doubt as to the exact method whereby hatching of the egg is brought about, and the first stage larvæ gain entrance to the body. Attached as the eggs of this species commonly are to the hairs of the cheeks and jowl of the horse, it is not clear how the larvæ gain the mouth of the horse, since the eggs are inaccessible to the animal's lips or tongue. In the case of *G. equi*, on the other hand, it is known that the warmth and moisture provided by the horse's nibbling at the fore or hind limbs where the eggs are attached provides the necessary stimulus to bring about the hatching, while the larvæ are then able to attach to the lips and so enter the mouth. In the case of *G. haemorrhoidalis* also, the eggs are deposited on the lips, so that no difficulty would arise.

Certain observers have claimed that, as in the case of several other species belonging to the same group (the *Oestridæ*), the larvæ of *G. Veterinus* are skin penetrators. Marotel (1927) actually figures a network of burrows converging on the horse's lips, these indicating the passage of larvae through the subcutaneous tissues from the point where the egg hatched and the larvæ entered the skin, to the horse's mouth, where they are then swallowed to reach the stomach. Dinulescu (1929) has also recorded skin penetration by first stage larvæ of *Gastrophilus inermis* in the horse and their passage by subcutaneous galleries to the mouth.

This present finding is an indication that, at times at least, skin penetration does occur, but how the stomach is ultimately attained is not suggested, and the specimens certainly would seem to have followed an aberrant course.

It will be remembered that, in the case of the warble fly (*Hypoderma spp.*), larvæ undergo a very complex and prolonged migration via the oesophageal wall and the neural canal before reaching their final site in the subcutaneous tissues of the thoracic or lumbar regions. It is also of interest to note that Portchinski has recorded two findings of *G. haemorrhoidalis* and one finding of *G. nasal* from the subcutaneous tissues of man in Russia, where such myiasis is said to be not uncommon.

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 MAROTEL, G. (1927): *Parasitologie Veterinaire*, Paris p. 545.
 PORTCHINSKI: Cited by Brumpt, E. (1927). *Precis de Parasitologie*, 4th Ed., Paris, p. 1452.

The Australian Veterinary Journal, Vol. VIII, No. 1.

EVOLUTION: THE POSSIBLE INFLUENCE OF NUTRITION.

BY

J. A. GILRUTH, D.V.Sc.,

Chief, Division of Animal Health, Council for Scientific and Industrial Research.

Perhaps no theory has ever so profoundly influenced scientific work and thought and few, if any, have so deeply influenced philosophy as that of Darwin in his great treatise "The Origin of Species, by means of natural selection or the preservation of favoured races in the struggle for life." His theory, hotly contested by many brilliant contemporaries and warmly supported by others, has now been generally accepted for more than two generations.

As we now know, variations which occur in individuals, particularly those which are of benefit in the struggle for existence, tend to be transmitted to at least a proportion of the off-spring, according to the Mendelian law. If these variations are beneficial they are more attractive to the opposite sex and so the tendency to their reproduction is increased. To be of benefit to the individual and eventually to the race, any variation must obviously react favourably to the environment.

Notwithstanding a vast amount of scientific research, we are still far from clear as to the cause of any variation from the normal or usual. Some maintain that any alteration, "acquired or innate," in form or structure of an animal may be transmitted to the progeny. But this is far from proved. Indeed, the weight of evidence is against it. As an example, for hundreds of generations the tails of sheep have been amputated, yet there is no indication that the tail of the newly born lamb of any breed of sheep is shorter than those of its ancestors thousands of years ago. On the other hand, any variation which may have taken place before birth (innate variation) is liable to be reproduced and persist in some of the progeny. Every breeder knows this to be a common place. But what is the actual cause of any variation such as a malformation, while the fetus is in the womb, we do not know, save in the case of ascertained injury to the mother.

Therefore the theories of evolution do not explain all the facts. There are still many problems; in fact, it is open to question if the theories have been of material assistance to the live-stock breeder. The breeder, on the other hand, furnished the brilliant observer Darwin with many of the data on which he based his theory. As we are ignorant of the actual cause of individual variations to-day, we are doubly so regarding the tremendous variations which have appeared in the past—those which persist; we are equally ignorant as to the real causes of the disappearance of many species of animals which at one time were very numerous on the earth. For example, we have the horse, remote ancestors of which lived in America, yet when the Europeans commenced to colonize that continent there was no trace whatever of his existence. The genus had been eliminated in the course of ages, probably long before man appeared. Natural conditions evidently had not permitted of his persistence, nor of his full evolution. Yet the conditions in the Asia-European Continent did permit of his persistence and further development. Why the difference we do not know. Throughout the world everywhere have been discovered the remains of many genera and species of plants and animals which are now extinct. Why for millions of years they were able to persist and why they finally became extinct, we do not know. We have only remains, sometimes of gigantic endo-skeletons (bones), and often of small exo-skeletons such as shells which have resisted the disintegrating forces of Nature because of their special construction. We have chiefly the very large, like the Mastodon, or the very small like the microscopic diatoms to demonstrate

that many forms of life which pervaded the earth tens or thousands of million of years ago have completely disappeared.

More recent times afford further problems more intimately associated with the human race. The littoral of the Mediterranean gives us the best example. On the northern shores we have a white people, on the southern and eastern, dark-skinned peoples. Yet we know that inland sea for thousands of years facilitated communication between the opposing races. The dark-skinned Moors held Spain for three hundred years. In Roman Italy, in Ancient Greece there were many Africans and Asiatics. European crusading armies and settlers held Palestine and the Levant for nearly two centuries. Still to-day the white race persists practically uncontaminated in Europe, while the dark-skinned hold the other lands washed by the Mediterranean Sea. Russia, which was dominated by hordes of Mongols for 150 years, remains virtually white. True, in all these lands traces of race admixture may be detected, but in substantially all the division remains as it has from time immemorial. Why we do not definitely know. Many theories have been advanced, but all are more or less inadequate.

During recent years science has been affording information which when complete may help to solve the mystery. It has been found, for example, that through the vast plains and forests of South Africa have always maintained an enormous fauna of various kinds, some mammals attaining huge proportions, that they were inadequate for the proper maintenance of European domesticated cattle and sheep. The question of disease has been, of course of great importance. But there were other factors. While the soil contained sufficient phosphorus for the nourishment of the natural herbage, which in turn was perfectly adapted for the sustenance of the indigenous herbivorous fauna, that very important element phosphorus was insufficient in quantity for the necessities of the introduced ox and the sheep. Hence to-day over large areas the provision as such a food adjunct of phosphorus as ground bones, phosphatic licks *et cetera*, if it cannot economically be added to the soil, is necessary for the well-being of these stock. Allied conditions have been long known to exist throughout many parts of Australia. The addition of phosphates to the soil is generally imperative if an adequate crop of wheat is to be expected. Its addition improves the pastures tremendously, enabling them to sustain a far greater number of animals than formerly, not only by increasing the bulk of plants produced, but by favouring the more valuable plants as against many which are of little value. Nevertheless it is evident, though no experimental work has been done, that the original amount of phosphorus was sufficient for the native marsupials.

The benefits of comparatively small application of phosphates are very marked. But other elements whose importance is more difficult to determine may be lacking. Iodine, which only exists in minute traces, is an important element in the construction of the body. If absent in the soil or existing in insufficient quantity, although quite sufficient for the nutrition of plants, the result is the development in human beings of goitre, a diseased condition of the thyroid gland, with all this serious concomitants. This is now so well recognised that in many parts of the world iodine salts are regularly administered to the school children. In certain parts of the South Island of New Zealand this procedure obtains. Absence of sufficient iodine may have been the reason why the Maori population of that island was never numerous in comparison with the North Island, where the food supply was no greater and the climate not appreciably milder.

One most remarkable instance of serious results following a chemical deficiency in the soil is connected with iron. For many years over a large of the Auckland Province, New Zealand, it has been known that while sheep and cattle,

born or introduced would remain healthy for about six months, afterwards a form of anaemia with emaciation appeared and that, if not removed to new pastures, death would ensue. The area is very well defined. The soil as a whole varies both physically and chemically, as does its fertility. Certain parts grow luxuriant grasses and clovers. Nevertheless, stock depastured on even the richest lands of the area inevitably develop the disease (known as "bush disease"), but rapidly recover when moved, it may be, to far poorer looking pastures outside the affected district. Analyses of blood and tissues demonstrated a lack of the normal amount of iron in the system. Analyses of the soils and herbage showed that there again the iron was below normal; still there was sufficient for the growth of all kinds of herbage. Further, pigs, horses and rabbits, as well as human beings, seemed to experience no inconvenience. Again administration of the usual iron as prescribed ordinarily, neither cured nor prevented the sickness. Every avenue of investigation gave negative results. The Chief Chemist (Mr. B. C. Aston) then suggested a special salt of iron (the double citrate of iron and ammonia). Administration of this chemical compound demonstrated the iron deficiency theory to be correct, or at least that iron deficiency was the most important factor in the disease. In every case of sickness the treatment proved successful. And now iron in this form is almost universally used by the farmer in the affected districts, either added to special food as in the form of licks *et cetera*, or included in top-dressing of pastures. Elsewhere, similar conditions have recently been found to prevail, notably in King Island, off the coast of Tasmania, and in parts of Great Britain.

Such investigations, therefore, not only prove of great economic value, but they widen the field of inquiry with many problems. There are certain elements which, though very minute in quantity, are or may be very valuable to animal life, and some far more valuable to one species than to another. The determination of their absence or their presence in abnormal degree may throw fresh light not only on the existence of certain plants and animals, but on their disappearance. And they may be closely connected with the persistence of one species over another in particular parts of the globe, even more important in their slow inevitable effect than wars and pestilences.

Such conditions may also account for the fact (well known to stock breeders) that seldom is the standard of particular breeds maintained quite equal to that of the original source of development. We have many examples. There is the short horn breed of cattle. For forty years many of the best bulls and cows of Great Britain have been exported at very high prices to Argentina. The result has been a tremendous improvement in the quality of Argentine cattle and beef. But the South Americans have not yet produced bulls and cows which can successfully compete with those bred on the soil of origin. The same is to be said of the Clydesdale and of the thorough-bred horses. Great Britain for generation has been exporting some, many indeed, of the best of each, yet still continues to do so. Other countries find it imperative to go to the fountain head to maintain the standard. For Australia the circumstance is significant. The Commonwealth, thanks to the initiative, the energy and ability of certain breeders, together doubtless with its specially suitable soils and climate, has developed by artificial selection, aided by favourable (for the particular purpose) environment, a wool-growing sheep which is unparalleled in the world. Great Britain almost simultaneously has produced mutton sheep of the highest quality, but England does not hesitate to export the best of her productions, feeling instinctively certain the quality cannot be maintained elsewhere without fresh blood from the motherland. Many Australian breeders, on the other hand, are very apprehensive regarding the export of our best rams and ewes. But experience suggests

they are needlessly trepidant. History shows that the more of the best quality of any breed that is exported, the more the demand will be for maintenance of the quality by successive importation from stock bred on the original home.

Why all these conditions obtain, we do not know. But we know they do obtain. Only exhaustive enquiry can give the explanation, and when it arrives much that is now obscure regarding the breeding of improved animals and of plants, will possibly become clear. It may be that these factors which are so important in the breeding of domesticated animals may have a definite application to man himself and particularly the white race. It is hardly likely to have been pure accident that while all the rest of the world was peopled by human beings with more or less pigmented skins, Europe (which after all is but a peninsula of Asia geographically) alone developed or at least maintained the white race, and further has never proved hospitable to the coloured. In historic times periodical waves of Asiatic hordes have made heroic and persistent efforts to flood Europe. Always—whether Mongol, Turk or Moor—they have retreated or become eliminated. The tremendous resistance of the Europeans was vitally important, but Nature may have been more on their side than we realise.

For the past hundred and fifty years, Europe has been pouring forth her surplus population, and the race has become established far and wide in countries formerly occupied solely by coloured races, races which have disappeared or are gradually disappearing before the energetic newcomer with his scientific methods of destruction and his diseases. But it is yet too soon to assert with full confidence that the new race in these countries will retain all its best characteristics. So far there has been great and regular additions of fresh blood. Even in North America, where European colonization began four hundred years ago, there has been a continuous influx of people from the motherland of the original settlers. During the past century the flood of newcomers increased year by year till before the Great War the immigration reached a million souls annually. It is seldom, therefore, that one, at least a traveller, meets in the United States an individual of the European race who can claim unbroken descent for more than three generations of American-born ancestors, that is fourteen forbears all American-born. Therefore, it is somewhat too early to dogmatize on the suitability of the New World for the satisfactory maintenance of the European race without the introduction of fresh blood from the source of origin. We know, on the contrary, that the "Southern States" particularly are admirably suited for the complete maintenance of the negro, and even for his improvement without the influx of new blood, for it is now many generations since slaves ceased to be imported from Africa. That the Red Indian, the Aztec, the Peruvian have gradually disappeared is true. But in addition to the causes already mentioned, the alteration of environment caused by the European has been contributing, just as it has been with the Australian aboriginal.

As with America, so with Australia and New Zealand. The South African Boer is, however, an exception. He has for several generations had but little fresh blood. But despite his fecundity he can hardly be said as a people to have kept pace either mentally or numerically with the original race, the Dutch in Holland. In South America there has been too much mixing with native races to be positive about the persistence of the European. Certainly the French Canadian, like the Boer, shows every evidence of complete acclimatization. But again has there not been on the whole a deterioration compared with the original stock? In considering this aspect it is wise to remember that originally the colonists of both these races were the enterprising, the energetic and the indepen-

dent. Therefore, development should perhaps have been greater rather than less.

At all events, the speculation in regard to mankind is interesting, though doubtless fruitless. But the researches which are now being pursued all over the world into "nutrition" and all that pertains thereto will undoubtedly throw much light on many important problems which have hitherto left science groping in the dark; and possibly also in regard to the many mysteries of evolution.

The Australian Veterinary Journal, Vol. VIII No. I.

THE MINERAL REQUIREMENTS OF DAIRY CATTLE

(From an article on 'Animal Nutrition' by Dr. C. Crowther, M.A., Ph. D., in 'Agricultural Research in 1930' John Murray, London, 1931.)

The study of the significance of the various mineral elements in animal nutrition, and their distribution in common feeding stuffs and fodders, has now become almost world-wide, and is producing a formidable literature that is difficult to survey. In the case of dairy cattle fortunately the situation has been recently reviewed by Crichton (*Journal of Dairy Research, Vol. iii, No. 1*) in a comprehensive monograph covering the requirements of growth, milk secretion and reproduction, supplemented by a bibliography of 124 references to work published up to the end of 1929. Despite this voluminous mass of work bearing on the subject the general conclusion is drawn that 'our information is exceedingly scanty'.....

Our knowledge is greatest with regard to the two elements, calcium and phosphorus, and the main points from Crichton's review of the existing information on the bearing of these upon the well-being and productivity of the dairy cow may be briefly summarised.

In the case of the half-grown animals, good pasture supplies an abundance of all the mineral elements necessary to maintain optimum growth and health. In the later stages of development, pasture deficiencies may adversely affect both growth and health, as in the case of the now familiar phosphorus deficient areas in South Africa. Calcium deficiencies are probably more common in this country, but there is no direct evidence as yet that pastures grazed by cattle are so poor in calcium that this deficiency affects the rate of growth and health, although a wider and more careful survey of our pastures may reveal such cases. In indoor feedings of half grown animals there is no evidence that the ordinary rations used in practice are deficient in calcium or phosphorus to such an extent as to cause obvious signs of malnutrition or retardation of growth.

Coming to the case of the lactating cow, good pasture will usually supply both calcium and phosphorus in suitable proportions, and moreover along with the factors (e.g. vitamin D) that make for assimilation of calcium. On poor pastures, however, deficiency of phosphorus may be so extreme as to limit milk production, but we are unable to say as yet whether deficiency of calcium in poor pastures may be so extreme as to affect milk yield.

In indoor feeding of milk cows, the concentrates commonly used, especially the cereals, though relatively rich in phosphorus, are poor in calcium, and for any but comparatively low milk yields are definitely deficient in this element. Such deficiency may adversely affect both milk yield and reproductive capacity.

In most of the observations that have been made during periods of heavy milk yield, it has proved practically impossible to maintain the store of calcium in the cow's body. On rations with a low calcium content, the drain on the body reserves may be reduced by the addition of calcium salts to the food, and under such conditions it is also desirable to ensure the presence of factors, such as

vitamin D, which aid calcium assimilation. 'Optimum conditions for this would appear to be obtainable by feeding fresh green leguminous pasture, or failing that, leguminous hay cured with a minimum of exposure, and by exposing the animals to sunshine and providing a certain amount of exercise. Even then the addition of a calcium supplement, with or without cod-liver-oil, would probably increase the amount assimilated'.

Crichton inclines to believe that in most heavy milking cows, there is a progressive depletion of calcium from the tissues, so that at the end of lactation there is actually less calcium in the animal's body than at the beginning, but the evidence on this point is conflicting. Thus recent American experiments with high yielding cows indicate that with suitable rations, reinforced by additions of calcium and phosphorus, although at the height of lactation losses of calcium from the cow occurred, these were subsequently made good as the milk yield fell....

From a survey of Swedish conditions Hansson concludes that in that country the milch cow will always need an application of salt to its food, and often also supplements of lime and phosphorus, but other minerals will probably rarely be required, apart from certain districts in which there is evidence that very small additions of iron and iodine may be helpful. As regards salt supply, he suggests a daily allowance according to milk yield at the rate of about 1.5 gm. per litre of milk (roughly $\frac{1}{4}$ oz. per gallon). For lime and phosphoric acid, a daily maximum of 40 to 50 gm. (barely 2 oz.) of each is suggested. His final word, however, for safeguarding the mineral supply for both dairy cows and young stock is a strong recommendation of the improvement of pastures, a conclusion at which Sjollesma also arrives in his survey of the mineral problem with reference to conditions in Holland.

(The Madras Agricultural Journal, Vol. XX No. 3.

PROCEEDINGS OF THE LEGISLATIVE COUNCIL OF THE GOVERNOR OF MADRAS, ON 21st & 22nd MARCH, 1932 ON VETERINARY DEPARTMENT.

As reported in the Press.

The Hon. Mr. P. T. RAJAN next moved that Government be granted a sum of Rs. 8,70,500 for Veterinary services.

21—3—32.

Mr. A.B. SHETTY moving a cut to discuss the policy and further expansion of the activities of the department said that the Second Minister was in charge of the nation-building departments all of which had been treated in a niggardly fashion this year. Rinderpest had become a permanent feature in this presidency, but there were less number of veterinary officers in the province in proportion to the heads of cattle. The first need was to have a large staff to do inoculation work including a Reserve Corps. He opposed the idea of levying fee for inoculation and cited the authority of the Royal Commission on Agriculture in support of his position. The number of Veterinary dispensaries far from being reduced must be increased and sufficient quantity of effective drugs should be supplied to them. An efficient Veterinary Service could be secured by providing a four-year course, raising the standard of Veterinary Education, affiliating it to the University for a degree being awarded.

At this stage, the House rose for the day.

22—3—32.

After question time the next day in the Legislative Council, discussion was resumed on Mr. A. B. Shetty's token motion to discuss the policy of Government in the Veterinary Department and the further expansion of its activities.

Mr. K. KOTIREDDI said that, though the ryot in the villages bore the chief burden of the taxation, he did not get an adequate return for the same. Government was not taking sufficient steps to help him in his pursuits. They now wanted to levy a fee for the inoculation of his cattle against rinderpest and this would be very hard on him. He was grieved to see that during the current year the provision made for veterinary dispensaries and surgeons was cut down. They might be left over to local bodies. He suggested to Government to examine how far the indigenous system of treatment of cattle could be adopted in the work of the department, considering that it would lead to a great saving of expenses. The staff should be recruited from men who took genuine interest in their work. He made the further suggestion that the Forest College, the Agricultural College and the Veterinary College might be amalgamated and this would bring about a more effective training of the students and lead to a financial saving also.

Mr. C. S. RATNASABAPATHI MUDALIAR said that, his complaint was that the usefulness of this department suffered greatly due to lack of co-ordination, of the co-operative, veterinary and agricultural departments. Livestock now formed a subordinate branch of the Agricultural Department; and so long as this system continued and Livestock was not attached to the Veterinary Department, inefficient work must continue. The suggestion for a levy of fee on inoculation, he said, had not been put forward as seriously as it had been made out by the Retrenchment Committee, and he was sure Government would not adopt such a step. He opposed the idea of leaving the conduct and maintenance of veterinary dispensaries to local bodies, as they would be a very heavy burden on their depleted resources.

Mr. BASHEER AHMED said that, even the slightest retrenchment in this department would be detrimental to the ryots and should not be undertaken. The number of assistants was too inadequate for the present needs; and the proposal to curtail even the present staff ought not to be put into effect. The stipends paid to them and the experience they had gained these several years would be lost to the province. He urged Government to reconsider the matter and re-entertain them. A suggestion was made by the speaker to train men for a period of six months to do merely the inoculation and castration work and in times of need these might supplement the work of the Assistants. Moreover a greater portion of the recruits to the veterinary services must be drawn from rural areas and particularly those belonging to families engaged in agricultural pursuits. The course of instruction in the veterinary college must be extended to four years for under-graduates and probably to three years to graduates.

Mr. NARASA REDDI said that, the existence of this department was not at all felt in the villages. Unless the advantages of this department were made available to the ryot at his very door it was no use running the service. A short course of instruction might be given to the ryots, who already possessed some knowledge of the methods of treating cattle diseases. Unless this was done, they could not in any near point of time undertake the work on the large scale that would be necessary. He suggested prompt assistance should be given in cases of outbreaks and instead of entrusting the task of reporting the same to the Tashildar and through him to the Veterinary Assistant, the ryots themselves might communicate through the nearest local body to the Assistant and it should be seen that assistance was given promptly. There must also be better control and check over the work of the Veterinary Assistants and dispensaries.

Mr. NACHIAPPA GOUNDER urged the Minister to drop any proposal there might be for levying fees for anti-rinderpest inoculation. The touring Veterinary Officers must be made to visit remote villages and give effective help to the ryots

The Stationary Assistants should also go about the villages instead of keeping to their dispensaries.

Mr. M. A. MANIKAVELU NAICKER said that, the chief wealth of the ryot were his lands and cattle. The existing staff and the department was not working as efficiently as they might. The Hon. Minister should infuse new vigour into them and 'hold the reins rather tight' if efficient work was to be done. He wanted that a member of the backward communities should be put on the Selection Board; and attention must be made to recruiting from the agricultural classes.

Mr. BAYABANI urged that, Government should do everything they could to help the ryot and protect him from the losses occurring every year by cattle mortality due to rinderpest and other epidemics. There were able doctors in the department but there were hundreds of villages which do not know of the existence of the department. He would appeal to the Government to bring home to the ryot the advantages of the service.

The Hon. Mr. P. T. RAJAN replying said that co-ordination between the Co-operative, Agricultural and Veterinary departments might be conducive to better work. If the usefulness of the department was not as great as it might be expected, it was not he said, due to want of co-ordination but due to inadequate staff to carry to the ryots the benefits of their knowledge to the ryots. The funds placed at the disposal of the department, was also inadequate. If more money was available certainly he would show better results. (Mr. Koti Keddy: Get the money). It was not possible to get as much as they would like to have. If they were to get complete immunity from rinderpest it would take thirteen years and involve fifteen times the present expenditure. It was worth it; but unfortunately the money necessary was not available. He would however state that he would consider the institution of a committee as suggested by Mr. T. A. Ramalinga Chettiar the previous day, even though, he was sure, that even without the formation of that committee such a co-ordination of those departments would be effected.

Proceeding he said that no orders had been finally passed in regard to the levy of fees for inoculation; he would bear in mind the remarks and suggestions made by members in passing orders. Much had been made of remarks and recommendations contained in the report of the Royal Commission on Agriculture. He would state that he was not going to be bound by the recommendations of any body, however eminent or august its composition, simply because the recommendation came from that body. He (the Minister) was there to consider the merits of a question and pass orders on them. As for transferring livestock from the Agricultural to the Veterinary Department, he did not think there was any need felt for the change but considering that the suggestions made by members for whom he had high regard, he would promise to re-consider them. Other members had stated that the work of the department was not felt in the villages, and that it was not doing its work efficiently. These were vague charges. If the members gave full details and instances on which they based their complaints, he promised to make enquiries into them. It was not possible to lay down any qualifications such as that the candidates should come from villages or belong to agricultural classes; there were rules laid down already and academic qualifications prescribed which governed recruitment.

Concluding he said he would like to make it clear that he did not take things light-heartedly as it was suggested. They were now working under several limitations and financial difficulties and the best service in this direction would be

possible when the entire Government of the province came in the hands of Ministers. Till then they must do their best under the limitations.

Mr. A. B. SHETTY: The hon. Mr. P. T. Rajan is so full of good intentions that I do not press my cut motion.

The original demand for veterinary services was then put to the House and carried and the grant was made.

Reviews.

Veterinary Obstetrics.—By W. L. Williams, Professor Emeritus, formerly Professor of Obstetrics and Research Professor in Diseases of Breeding Cattle in the New York State Veterinary College at Cornell University. Ed. 2, 1931, 482 pages, 101 figures. Published by the author, Ithaca, N. Y. Price 37 s. 6 d.

This is a work of stupendous value, which deserves to be in the library of every Veterinary Practitioner. Apart from much material of academic interest on subjects such as Anomalies in fertilization, Embryology, the Bacterial Flora of the Pregnant Uterus, etc., very many useful suggestions are recorded under the 'Handling of various forms of dystokia.' The owner of the animal judges the value of our profession, from the result of our efforts in such cases. The book provides a safe and useful guide. Professor Williams has enriched the profession by his work.

Annual Administration Reports of the Bombay Veterinary College, Bombay City and Harbour Veterinary Department and Civil Veterinary Department in the Bombay Presidency (including Sind) for 1930-31.

The Bombay Civil Veterinary Department has been the pioneer of all the Veterinary Departments in India and it is a great pity that, in the matter of organisation, it now lags far behind many other provinces. The lack of a unified control has been the main cause for this and therefore, unless the Department is reorganized and brought under one controlling authority, there cannot be much of a progress.

During the year under report the mortality from contagious diseases has been higher than that in the previous year and, as usual, Rinderpest has claimed the greatest toll. The reporting of outbreaks has not been quite prompt in some divisions and this has mainly contributed to the rapid spread of the disease over a wider area.

The Bombay Veterinary College is still heavily handicapped for want of a good laboratory, the construction of which has again been put off owing to financial stringency.

Mr. K. Hewlett, the Principal of the College since 1910, is shortly to retire and the Government have recorded their high appreciation of his services to the College and his devotion to its interests.

Annual Report of C. V. D., Central Provinces and Berar for 1930-31.

Major Stirling's report always makes an interesting record. The Government say that financial considerations preclude the adoption for the present of S. S. inoculation against Rinderpest. We refer them to our article on Penny

Wise and Pound Foolish" policy which appeared in our last issue. "A series of experiments have been planned for execution during the forthcoming year" says Major Stirling and he adds "The results of these experiments, if we are successful, will save the Local Government a certain amount each year. We wish him every success. Following his example, we also retrench our remarks on his report!"

Annual Report of C.V.D. United Provinces for 1930-31.

The absence of S. S. inoculation against Rinderpest in rural areas needs to be recorded. Three dispensaries were closed down by District Boards for want of funds! The Government of United Provinces would do well to take up the management of Veterinary Institutions under their direct control. Breeding operations in horses and donkeys are under the Veterinary Department; but in cattle, we presume it is under the Agricultural Department. We hope Captain S.G.M. Hickey will try and convince his Government of the legitimate claims of the Veterinary Department to have the control of breeding operations of all live-stock in the Province.

Annual Report of C.V.D. Mysore, for 1930-31.

As usual this makes an interesting report. Rinderpest claimed the lowest toll for the past many years. It is reported that in 24 villages where S. S. inoculations were undertaken, it was not quite successful, there were 351 attacks after S.S. inoculation and 208 deaths from typical Rinderpest. The cause was being investigated and it would be interesting to know the findings. A single vaccination against Rinderpest with attenuated goat virus was tried and "the results are very promising". It is just Mysore-like, progressing from step to step. We hope the days of pushing in massive doses of serum against Rinderpest are numbered. The Government have recorded "their appreciation of the services of Major Simpson under whom the department made considerable progress and attained the present standard of efficiency". All those who have known the work of the Major will understand how well deserved is the tribute. We congratulate Mysore on yet another year of good progress.

Annual Report of C.V.D., Burma, for 1930-31.

This report makes a sad reading both from point of work turned out and many unpleasant statements made which we wish were better left unsaid.

For instance after quoting the figures of work turned out at Pegu dispensary which by the way is not much with only an average attendance of 146 per day—the report says "In the absence of efficient supervision these figures are accepted with considerable doubt". It is also said that the dispensary is to be closed "as it is very inefficiently run and not considered to be serving any useful purpose". Similar action has already been taken with regard to Prome Veterinary Dispensary. There must be something rotten in the state of Denmark!

S. S. inoculation against Rinderpest is still to be extended to rural areas on a large scale. We advise Burma to speed up. Good work in the way of protective vaccination of elephants, cattle and buffaloes with spore vaccine has been done. "The system of vernacular tuition in elementary Veterinary Science" says the report ".....resulted in the production of a more or less numerically strong but professionally incompetent class of Veterinary Assistants". That is the result of a scheme of wiseacres who say "Thus far and No farther" in the matter of Veterinary education. Burma has supplied a good example.

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