

219

THE
INDIAN VETERINARY JOURNAL
PUBLISHED BI-MONTHLY

(THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION)

26, WALLAJAH ROAD, MOUNT ROAD P. O., MADRAS (S. INDIA)

Vol. XXIII

November, 1946 446

No. 3

Stilboestrol Dipropionate
solution in oil M&B



Stilboestrol and its dipropionate
fulfil the functions of the natural
oestrogenic hormone. Its uses in veterinary
practice include the treatment of anoestrus
due to sub-normal ovarian activity and
pyometra in cattle. It has also been used for
the induction of lactation in goats and helpers
and symptoms of false pregnancy in bitches.

Rubber-capped bottles of 5 c.c. (1 mgm. per c.c.)
Rubber-capped bottles of 10 c.c. (10 mgm. per c.c.)

MAY & BAKER LTD.

Distributed by MAY & BAKER (INDIA) LTD.

JL
KZ m2, n24
N 46. 23.3
79224



Coramine, pyridine-beta-carboxylic acid diethylamide, is the world-famous analeptic with dual stimulating effect on the nerve centres, regulating circulation and respiration. It has low toxicity and no cumulative effect.

AVAILABLE IN
AMPOULES, TABLETS & LIQUID.

SOLE IMPORTERS:



CIBA (INDIA) LIMITED.

PHARMACEUTICAL DEPARTMENT,

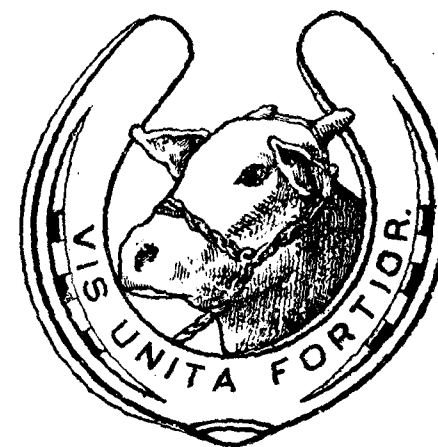
P. O. Box 479 - BOMBAY.

Published Bi-Monthly
Vol. XXIII

November 1946
No. 3

THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)



Editor:

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

Veterinary Surgeon, Madras.

Office: 26, Wallajah Road, Mount Road, Madras (S. India)

NOTICE

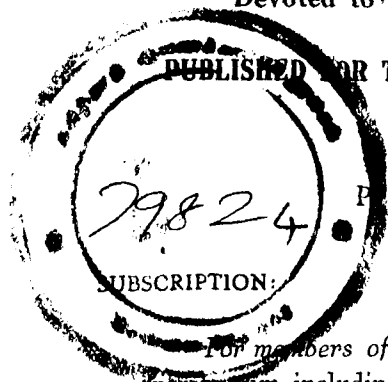
The Indian Veterinary Journal

A Bi-monthly Record of Veterinary Medicine and Surgery
Devoted to the Cause of Veterinary Profession.

PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION

EDITOR :

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



For members of the profession and students:—Rs. 4 or 6s. 8d.
per annum including postage, in advance. Re. 1 or 1s. 8d. per
part.

For others:—Rs. 8 or 13s. 8d. per annum in advance, or
Rs. 2 or 3s. 4d. per part.

1. Original Articles, Clinical Notes, Society Reports and
Notes on interesting cases are invited. Contributors of Original
Articles will receive 10 Copies of their papers free if wanted.

2. All Editorial Communications, Reports and Books for
Review and Exchange should be addressed to the Editor.

3. All contributions should be sent to the Editor. Contri-
butors are requested to sign their contributions. All communi-
cations must be authenticated by the name and address of the
writer whether intended for publication or not.

4. Members who do not receive the Journal regularly,
or who find it wrongly addressed, are requested to communi-
cate their correct address to the Editor at once. Non-receipt
of a particular issue should be intimated before the receipt
of the subsequent issue. If not those copies will be charged
for.

ESTROGEN THERAPY

The availability of dependable yet inexpensive analogues
of the oestrogenic hormones brings specific therapy of
many reproductive disorders within the scope of routine
veterinary practice. The products listed below enable
the needs of both large and small animal practice to be
met by convenient and accurate dosage.

'HYPOLOID' BRAND

STILBESTROL DIPROPIONATE

(Veterinary)

For intramuscular injection: 10 mgm. per c.c., in bottles of 10 c.c. and 25 c.c.
1 mgm. per c.c., in bottles of 5 c.c.

'WELLCOME' BRAND

SOLUTION OF STILBESTROL IN OIL

(Veterinary)

For intra-uterine injections: 1 mgm. per c.c., in bottles of 100 c.c.



BURROUGHS WELLCOME & CO., LONDON

(The Wellcome Foundation Ltd. Incorporated in England)

Associated Houses:

NEW YORK MONTREAL SYDNEY CAPE TOWN SHANGHAI BUENOS AIRES CAIRO
AND COOK'S BUILDING, HORNBY ROAD, BOMBAY

'B.W. & Co.'

A MARK TO REMEMBER

Indian Vet. Jnl.

71 x 42

0599

When writing to advertisers, please mention this Journal.

ALBERT DAVID LIMITED

(VETERINARY DEPT.)

SIOLAN Sterile milk protein injections. **FEEBLE STIMULATION-MILD & MODERATE REACTION**. Invaluable in cases of eczema, ulcers, offensive discharges, glandular affections, genito-urinary diseases.

SIOLAN cum IODINE with .04% colloidal iodine to bring about speedy inflammatory resolution. For cases of glandular fever, endometritis, salpingitis.

COLLO-MANGANESE .25% injectable solution. Greatest colloidal activity, readily absorbable. In strepto-and staphylococcal infections and suppurating conditions.

SIONAMIDE OINTMENT 5% of p-amino-benzene sulphonamide and .40% of pure codliver oil with standardized vitamin A contents.

For the treatment of wounds where the action of sulphonamide is strengthened by vitamin A accelerating granulation and growth of epithelium.

LITERATURE ON REQUEST

ALBERT DAVID LIMITED

15, Chittaranjan Avenue :: :: CALCUTTA

When writing to advertisers, please mention this Journal.

The Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XXIII

NOVEMBER, 1946

No. 3

CONTENTS

446

PAGE

I. General Articles

- Observations on the Distribution of Disease, Including Neoplastic Disease of the Generative, Urinary and Locomotory Systems of the Domesticated Animals.—By D. C. Matheson, F.R.C.V.S., D.V.S.M. ... 171
- An Outline on Genetic Factors in Goats and Cats.—By S. V. Sekhadeo, G.B.V.C. ... 177
- The Occurrence of Contagious Caprine Pleuro-Pneumonia in Assam.—By V. R. Gopalakrishnan, G.M.V.C., P.G. ... 190
- Rinderpest and its Control in the Province of Bombay.—By R. N. Naik, G.B.V.C. ... 203
- Rinderpest in Tanjore District.—By George Ebenezer, G.M.V.C. ... 216
- A Note on Glycosuria in Rabies.—By D. Krishnamurthy, B.V.Sc. ... 219

II. Editorial

- Our Food Position. ... 223
- Retirement—Khan Bahadur Abdul Hamid Khan, G.B.V.C., P.G. (Edin). ... 226
- Late Rao Sahib V. P. Subramaniya Mudaliar, G.B.V.C. ... 227

III. Clinical Articles

- A Myxofibroma in the heart of a goat.—By H. K. Lall, B.Sc., M.B.C.W.S. ... 229
- Retention of Placenta—A safe Technique for its Treatment.—By Capt. S. B. V. Rao, I.A.V.C. ... 231
- Equine and Bovine Surra—Its Incidence in Baroda State during the years 1944 and 1945.—By H. V. Kulkarni, G.B.V.C., P.G. ... 233

IV. Association News

1. The All-India Veterinary Association, Madras Branch—Proceedings of the Provincial Veterinary Conference held on the 28th, 29th and 30th September 1946 ... 239
2. " Welcome Address.—By Rao Bahadur R. Swaminathan. ... 240
3. " Opening Speech.—By the Hon'ble Mr. P. S. Kumaraswamy Raja ... 249

CONTENTS—(contd.)

	PAGE
4. The All-India Veterinary Association, Madras—Presidential Address By Rao Sahib K. Kylasamier. ...	254
5. " Vote of Thanks—By Rao Sahib T. Vinayaka Mudaliar. ...	259
6. " Resolutions. ...	263
7. The All-India Veterinary Association, Madras Branch—Proceedings of the Annual General Body Meeting held on the 30th September 1946. ...	270
8. The Madras Veterinary Association—Proceedings of the Managing Committee Meeting held on 21-10-46. ...	274
9. The All-India Veterinary Association—Statement of Receipts and Payments of the <i>Indian Veterinary Journal</i> vol. XXII. ...	275
V. College News	
Madras Veterinary College—Supplementary Diploma Examination Result, held in October 1946. ...	276
Bihar Veterinary College—Supplementary Diploma Examination, 1946. ...	276
VI. Correspondence	
Grant of Permanent Commission in Indian Army Veterinary Corps— Letter of Director of Army Veterinary Services in India. ...	277
Facilities for G. M. V. Co. to take the B. V. Sc., degree—Letter from Sri M. R. Subramania Sastri, G. M. V. Co. ...	278
Trained personnel from Pro-Bono-Publico ...	279

THE INDIAN VETERINARY JOURNAL

★

VERY FEW COPIES OF BACK VOLUMES AVAILABLE

Apply Immediately to Avoid Disappointment.

★

Rs. 4. Per Volume.

Re. 1. Per Issue.

THE INDIAN VETERINARY JOURNAL

(The Journal of The All-India Veterinary Association)

Vol. XXIII

NOVEMBER, 1946

No. 3

General Articles.

OBSERVATIONS ON THE DISTRIBUTION OF DISEASE,
INCLUDING NEOPLASTIC DISEASE OF THE GENERATIVE,
URINARY AND LOCOMOTORY SYSTEMS OF THE
DOMESTICATED ANIMALS.

D. C. MATHESON, F.R.C.V.S., D.V.S.M.

Edinburgh.

Control lies with Causes, not with Effects,

D.C.M.

The cause originates the lesion, the lesion produces the disease: thus organisms may excite pneumonia, and the inflammation of the lungs gives rise to dis-ease, generally pronounced and written disease.

The cause may be removed, but the lesion—albeit modified—may remain and be a source of dis-comfort or even dis-ease, for the remainder of the animal's life; consider, for example, cirrhosis of the liver, fibrosis of the lungs, induration of the kidneys, udder, etc., etc.

It is on a knowledge of the cause of a disease that we must rely for the provision of adequate control measures; a study of the lesions may assist diagnosis and is important since the alterations in structure lead to the all-important modifications of function, and the Veterinary Surgeon is primarily concerned with modification of function, not with alterations in structure since his aim is to relieve suffering and to restore usefulness. Applying these reflections to the following list of diseases and indeed to those which have appeared in earlier articles of this series (1), we must admit that we are more familiar with effects than with causes, a condition of things which is being remedied by the increasing application of physiological and biochemical methods of investigation to the elucidation of the causes of the diseases indicated—by the establishment of what may be called—following the precedent of morbid anatomy—morbid physiology, a term which, frankly, does not seem very satisfactory, so Pathology is used to include both.

Turning now to the tables :

Table I shows the number of diseases, the number of cases and the total numbers of animals among which diseases of the generative system were found.

TABLE I.
Generative System.

Diseases.	Cases.	Animals.
20	241	3189
6	16	278 horses
8	22	1325 oxen
3	4	211 sheep
1	1	100 pigs
14	181	894 dogs
5	17	185 cats.

There were no cases recorded among the other animals of the series, viz., the Goat, Fox, Rabbit, etc.

Table II shows the number and types of the diseases of the generative system encountered in the present enquiry, the number of animals affected and the distribution of the cases among the animals concerned.

TABLE II.
Generative System.

	Horse	Ox	Sheep	Pig	Dog	Cat	Total
Abscess	1				1		1
Balanitis			1		1		2
Cystic ovaries	2	1		1	1		5
" uterus					4		4
Prolapsed uterus		1					1
Ruptured "					1		1
Metritis	2	1	2		35	9	49
Mammitis	1	8			5	2	16
Necrosis, mammary gland					1	1	2
Scirrhus os		1					1
Vaginitis	2				1		3
Venereal disease						1	1
Retained foetus		1					1
Orchitis		1	1				2
Hypertrophy, prostate					2		2
Inflammation "					1		1
Necrosis "					1		1
Atrophy, testis					1		1
Fibrosis, testes					1		1
Tumours, including teratomata.	9	8			126	4	147
Totals	17	22	4	1	181	17	242

It will be noticed that among the 242 cases of disease of the generative system, there were 49 cases of metritis—35 of which occurred in the bitch. Sixteen cases of mammitis are recorded—8 of which occurred in the cow and 5 in the bitch.

147 tumours are recorded, of which 126 occurred in dogs. The tumours of the horse include 2 epitheliomata of the penis and 6 teratomata, which are not usually included with the neoplasms but may be conveniently referred to in this place. Of these 6 teratomata of the testis—2 occurred in foals and one in a three year old horse. One papilloma of the vagina occurred in a mare. Tumours of the generative system of the cow include a papilloma and a fibro-lipoma of the uterus, 2 fibromata of the vagina, a fibromyxoma and a very vascular sarcoma also involving the vagina, and one carcinoma of the mammary gland with secondary growths in the lungs. The 77 tumours recorded from the mammary gland of the bitch include 15 fibro-adenomata; many of these were cystic and two of them—one in a Collie and other in a 19-year old Chow—showed mucoid degeneration. Of the 9 fibro-chondromata—4 showed larger or smaller areas of ossification and one, mucoid degeneration, and one exhibited traces of a melanin pigment. Eight carcinomata are recorded—one in a Sealyham terrier, one of the alveolar variety in a spaniel, one of the scirrhus type in a Golden Cocker Spaniel, one in an Airedale, while one case was of the intraduct variety. Ten cystic adenomata are recorded, one in a Bull-terrier, another, in a Labrador retriever, showed numerous papilliform outgrowths into the acini; three occurred in spaniels, another contained a good deal of cartilage; a seventh occurred in an Airedale and the eighth in a Yorkshire terrier; the ninth in a Labrador retriever and the tenth in a Newfoundland. One case of multiple adeno-chondroma was encountered.

One chondroma was met with in a terrier. Two osteo-chondromata, one of them in a Scots terrier, were encountered and 2 fibro-osteochondromata—one in an Alsatian and the other in a Border terrier; two fibromata were met with—one in a sheep-dog, the other in a Scots terrier; 2 lipomata were met with—one in a Scots terrier, the other in a spaniel. Six adenomata were found, one in an Alsatian, the second in a spaniel, the third in a Cairn terrier; the breed of the dog was not recorded in the fourth case, while the fifth occurred in an Airedale and the sixth in a Labrador retriever. Eight adeno-carcinomata were found—one in a Scots terrier, the second in a Greyhound, the third in an Airedale; in the fourth case the breed of dog was not recorded, but the growth was particularly malignant and had infected the flank region. The fifth case occurred in a Yorkshire, the sixth in a Spaniel, the seventh in an Airedale; this growth was characterised by extensive papilliform ingrowths into the acini.

Five sarcomata of various types were met with—one angio-sarcoma in a Spaniel; the second, a round-celled sarcoma, in a Labrador retriever; in the

third—an osteo-chondro-sarcoma, the breed of dog was not recorded; the fourth was a fibro-chondro-sarcoma in a Spaniel; the fifth was a spindle-celled sarcoma in a Labrador retriever. One growth recorded as a blastocytoma was encountered in a spaniel. Twenty-eight seminomata of the testis were encountered in dogs; five of these among Fox terriers, one of which animals was 10 years old; 2 among Scots terriers, 2 in Cairn terriers; 2 in cross-bred terriers and 2 in spaniels, and one in each of the following breeds:—Airedale, Collie, old English Sheep Dog, Irish Setter and Pekinese spaniel.

Two round-celled sarcomata were encountered, one involving the prepuce, the other, in an Irish setter, had attacked the scrotum. A diffuse myoma was found involving the scrotal region in a Samoyede dog. Three tumours involving an ovary were encountered, one a cystic adenoma in an Alsatian; another a carcinoma in a Collie, while the third, an adenocarcinoma, occurred in a Pomeranian and showed secondary growths in the liver.

Two growths were found in connection with the uterus, one a fibroma of the cervix-uteri in a Pomeranian, the other a cystic adenoma in a Collie.

Fourteen tumours of the vagina were met with in the bitch—4 of these were fibromata, of which one occurred in a Scots terrier and another in a St. Bernard; 3 fibro-myomata were encountered, one of them in a Cocker spaniel, another in a Sealyham terrier; while 2 sarcomata, one fibrosarcoma, and one fibro-lipoma in a terrier, and one papilloma in the spaniel and one myo-lipoma in a Bull-terrier, and one polypus, complete the series.

The five tumours of the generative system of the cat include a myoma of the uterus and 4 growths in the mammary glands, viz., 2 adenocarcinomata, one fibro-adenoma and one cystic adenoma.

Urinary System.

TABLE I.

Diseases.	Cases.	Animals.
10	... 58	... 3189
2	... 2	... 278 horses
7	... 16	... 1325 oxen
1	... 1	... 211 sheep
1	... 1	... 100 pigs
5	... 24	... 894 dogs
5	... 12	... 185 cats
2	... 2	... 83 foxes

Urinary System.

TABLE II

Diseases	Horse	Ox	Sheep	Pig	Dog	Cat	Goat	Fox	Total
Cystitis ...		2			1	1			4
Fatty kidneys ...		2		1		5			8
Glycosuria ...	1								1
Haematuria ...		2			1				3
Haemoglobinuria ...		1				1			2
Hydronephrosis ...		1							1
Induration, kidneys ...					3				3
Nephritis ...	1	7	1		15	3		2	29
Uraemia ...						2			2
Tumours ...		1			4				5
Totals ...	2	16	1	1	24	12		2	58

Urinary System

Table I shows the number of diseases and the number of cases distributed among the animals tabulated. It will be noted that among the 58 cases recorded, 29 are due to nephritis. Table II shows the number and types of the diseases of the urinary system encountered in the present enquiry; the number of animals affected and the distribution of the cases among the animals concerned.

Sixteen cases of diseases of the urinary system are recorded in the ox; 7 of these were cases of nephritis; some of them cases of pyelonephritis in the cow. Of the 24 cases met with in the dog, 15 were cases of nephritis and 3 of induration of the kidneys, which showed the characteristic cysts in the medulla. Twelve cases of kidney-disease are recorded from the cat—in 5 of these the kidneys showed extensive fatty infiltration. Two cases of uraemia are recorded, both in cats.

With regard to tumours, the records include a papilloma of the bladder of an ox; a fibroma of the bladder in a 5 year old Borzoi dog and a smooth myoma of the bladder of a Spaniel; an adenocarcinoma of the kidney of the dog, a sarcoma of the kidney; also of the dog.

Locomotory System Including the Skeleton.

TABLE I.

Diseases.	Cases.	Animals.
14	... 31	... 3189
5	... 11	... 278 horses
2	... 3	... 1325 oxen
1	... 1	... 211 sheep
3	... 3	... 100 pigs
5	... 6	... 894 dogs
3	... 3	... 185 cats
1	... 1	... 20 goats
1	... 3	... 4 mules

Locomotory System.

TABLE II.

Diseases	Horse	Ox	Sheep	Pig	Dog	Cat	Goat	Fox	Rabbit	Other Animals	Total
Abscess ...	1										1
Arthritis ...	2				1	1					4
Bursitis ...				1							1
False bursa ...				1							1
"Canker" ...	5										5
Dislocated neck ...					1						1
Fatty infiltration muscles ...		1									1
Foot-rot ...			1								1
Fracture ...					1	1					2
Osseous cachexia..				1			1				2
Osteomyelitis ...	1										1
Rickets ...					1						1
"Thrush" ...										(Mules)	3
Tumours ...	2	2			2	1					7
Totals ...	11	3	1	3	6	3	1			3	31

Locomotory System Including the Skeleton

Table I shows the number of diseases and the number of cases distributed among the animals tabulated. Table II shows the number and types of the diseases of the locomotory system encountered in the present enquiry; the number of animals affected and the distribution of the cases among the animals concerned.

It will be noticed that tumours occupy the highest place, that cases of canker come next, while those of arthritis occupy the third place.

Of the 11 cases of diseases affecting the locomotory system in the horse, 5 are due to canker. Of the 6 cases in the dog, 2 were the result of accidents; and of the 3 cases in the cat, one followed an accident.

One case of osseous cachexia was met with in the pig and one in the goat. The disease is not common in Great Britain.

Tumours of the locomotory system are not numerous, but include a myeloid sarcoma and an osteoma in the horse; a spindle-celled fibro-sarcoma in connection with the thoracic vertebrae in a 5-year old ox—this tumour showed secondary growths in the lungs. An osteo-sarcoma affecting the upper and lower jaws of a bullock was also encountered. Two tumours were recorded from the dog—one an osteo-chondroma involving the elbow-joint, the other an ossifying fibrochondroma of the jawbone. A myeloid sarcoma was found involving the humerus of a cat.

Two cases of myoglobinuria (one in a stallion) were encountered; this disease, although involving the locomotory system, does not necessarily originate there, hence these cases are not included in the foregoing figures.

Reference:

1. Matheson, D. C. (1945-46) *Ind. Vet. Jour.*

AN OUTLINE ON GENETIC FACTORS.

BY

S. V. SAKHADEO, G.B.V.C.,

C. V. D. Bombay, on deputation to U. S. A. for Study in Animal Genetics.

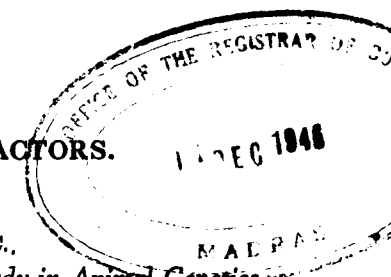
I. In Goats.

The goat belongs to the family Bovidae, genera capridae, probably descended from the Pasañg or Grecian ibex (*capra hirus oëgañrus*), a species of wild goats found in Asia Minor, Persia and contiguous countries.

The Province of Angora in Asia Minor gave the name to the Angora goats. Other principal breeds found are (1) Toggenburg (2) Saanen (3) French alpine & (4) Anglo-nubian. Pasañg is a short haired animal and Angora is a long haired animal and it seems the long hair of Angora was evolved from Pasañg by a process of selection.

CHROMOSOMES

The male is the heterogametic sex. About 60 chromosomes are present according to Sokolov (1930). The United States Department of Agriculture reports give a sex ratio of 54 males to 46 females. Sokolov has



furnished cytological proof and has conclusively proved the chromosome number to be 60 (diploid).

ANGORA GOATS

The investigations on Angora goat are carried on only at the Experimental Station at Sonora, Texas (U. S. A.). Records of goat breeding in Turkey are available even as far back as 2000 years.

ECONOMIC USE OF GOATS

Goats are being used for the production of Milk, Mutton (Chevon) and Mo-hair. U.S.A. leads the world in mo-hair industry. South Africa and Turkey follow suit. In United States of America during 1940, 4241000 goats were clipped, each with 5 pounds mo-hair on an average. Mo-hair is used for the manufacture of materials for chairs, seats for furniture, automobiles and railways. India possesses a large number of Goat population being almost the first in the world—but there is no fixed breed.

MORPHOLOGICAL CHARACTERS

Horns: Warwick (1933) found that the presence of horns is dominant to hornlessness and suggested that one major factor governs the inheritance of this character although no definite conclusions could be arrived at due to meagre data.

Cryptorchidism: This is a condition in which the testis do not descend into the scrotum. It is an inherited defect and is quite common in Angora goats and has been investigated by Lush, Jones & Dameron (1930) and Warwick (1933). Mode of inheritance is not known and its determination is difficult since it can be seen in males only. The condition is recessive and at least two pairs of factors are involved.

Fleece length: Davies (1912) reports long-haired condition in Angora is recessive to the short-haired condition. The length of the fleece is due to multiple factors.

The effect of individual differences and of such factors as age, sex, pregnancy and lactation on the quality and quantity of fleeces produced by Angora goats has been investigated by Lush, Jones, Warwick, Dameron and Davies. About 17% differences in fleece weight produced by goats similar in age, sex and general breeding is permanent throughout the life of the individual and is subject to selection.

Coat colors in milk-goats: Lush (1926), Asdell, Smith and Buchanan (1928) suggest the following color series in goats.

A. Black series (3 kinds of black)

1. Black—This is recessive to chocolate, fawn or cream.
2. Chocolate—Dominant to black or chocolate.
3. Fawn—Dominant to black or chocolate. Entire black series are recessive to cream or white color.

B. Tan and Red series:

They are recessive to all black series.

C. Brown:

Brown is dominant to black, tan and red series.

D. Gray:

Gray is dominant to black, red and tan but recessive to Brown.

E. White series (3 kinds of white)

1. Pure white of the Saanen is epistatic to all colors.
2. Extreme cream.
3. White spotting.

FACTORS REPORTED IN GOATS OTHER THAN ANGORA GOATS

Horns. Lush (1926) reports that in Toggenburg goats horns are inherited as a recessive character in a Mendelian fashion. PP—Polled; Pp—Heterozygous; pp—Horned.

The heterozygous condition can be distinguished only in subsequent progenies.

Horns and Intersexes.—S. A. Asdell (1944) in reviewing the published data on intersexes believes that they are all modified females and that intersexuality is due to a recessive gene which modifies female development, but does not affect male development. From the observation of 200 goats, he finds that all the intersexual goats have been hornless. It thus appears that the gene for hornlessness is closely linked with the gene for intersexuality.

O. N. Eaton (1945) in reviewing the data on Beltsville herd of Saanens and Toggenburg confirmed the inheritance of intersexuality as a simple recessive and of hornlessness as a simple dominant. No horned intersexes were produced; if they do occur they must be due to crossing over between closely linked genes. Intersexes may be avoided by mating a polled with a horned animal.

Mode of wattle inheritance.—Wattle is sometimes called Tassels. One pair of gene is involved. Asdell and Smith (1928) found that wattled condi-

tion is dominant over non-wattled condition. It is sex-linked and dominant in male and recessive in female.

WW—With wattles; Ww—Heterozygous with wattles;
ww—No wattles.

Lush (1926) however, proved by actual experiments, that wattles is not sex-linked. Asdell and Smith in 1928 do not seem to have taken cognisance of Lush's experiment on sex-linkage in inheritance of wattles.

Nervous instability.—White and Plaskett (1904) reported inherited instability as observed by them.

Hooper (1916) observes that goats when frightened will have the hind legs stiffened followed by stiffness in the fore-legs and fall to the ground in a rigid condition. They are called stiff-legged or sensitive goats. They are snow-white in color and look like ordinary goats.

Whether this condition is dominant or recessive is not determined.

Presence of short ears.—Wassin (1928) suggests that one pair of gene is involved and that long ears are incompletely dominant. He gives the following types.

AA—Homozygous long ear. Aa—Intermediate. aa—Recessive short.

Keb (1934) however found short ears to be dominant. The exact mode of inheritance in either case has not been determined.

Beards.—Asdell (1927) reported that 'beards' is sex-linked—dominant in males and recessive in females. The beards develop in both sexes at puberty.

De-mamilla.—Addington and Cunningham (1939) report that this character in which there is absence of one or other teat, is inherited and that two or more pairs of factors are involved.

Twins and Triplets.—Gea G. de (1944) observes that the Murian goat is found in the Mediterranean region of Spain which regularly produces twins, triplets and often four or five kids.

Hairlessness.—Asdell (1937) reported that Kislowksi has given an account of a male goat which was born hairless but which gradually developed a normal coat. When he was mated to his dam, he sired two kids, one normal and other hairless, the latter did not develop properly and died at two months.

This condition is caused by a recessive type.

IMPROVING THE BREED

Asdell and Marquardt (1939) report that selection in livestock which is made pheno-typically should be substantiated both by practical experience and genetic evidence. Progeny test is important in evaluating breeding animals.

Chemical composition of goat's milk and cow's milk stated by them is as follows.

	Water	Total solids	Fat	Lactose	Ash
Goat	88.02	11.98	3.50	4.55	.80
Holstein-Fresian	87.50	12.50	3.55	4.86	.68
Jersey	85.31	14.69	5.18	4.94	.70

If the lactation is maintained from 7 to 10 months, a good goat produces 3 quarts of milk a day while an yield of 4 quarts and above is considered excellent. A few may produce at the peak of lactation 20 pounds a day.

References:

1. Addington L. H. and Cunningham O. C. (1939): "An inherited de-mamilla in milk goats", 7th. *International Genetics congress*.
2. Asdell S. A., Smith and Buchanan A. D. (1928). "Inheritance of color, beard, tassels and horns in goats". *Journal of Heredity* 19: 425-430.
3. Asdell and Marquardt, in *Cornell Extension Bulletin* for June 1939.
4. Asdell S. A. "Review of intersexual goats", in *Science* 99, 124, 1944.
5. Asdell S. A. and Buchanan A. D. "Some practical observations on the inheritance of coats, beards and tassel in goats" *British Goat Society's Year Book* 1927.
6. Eaton O. N. "Inheritance of intersexuality in goats," *Animal Breeding extracts* 2: 1945.
7. Hooper J. J. (1916): "A peculiar breed of goats". *Science* 43: 571.
8. Kab, E. (1934): "Erblicke Stummelohren Beo Der Zeiße". *Zuchtungsakunde*. 9: 452-455.
9. Kislovsky E. (1937): "Inherited hairlessness in goats". *J. of Heredity* 28: 265-267.
10. Lambert W. V. "Breeding problems with Angora goats," *U. S. D. A. Yearbook* (1937), 1294-1313.
11. Davies C. J. (1912): "Heredity in goats", *Mendel Journal* 3: 104-116.
12. Lush J. L. (1926): "Inheritance of horns, wattles and color in grade Toggenburg goats." *J. of Heredity* 17: 73-91.
13. Jones J. M. and Dameron W. H. (1930): "The inheritance of Cryptorchidism in goats." *Texas Agri. Exp. Sta. Bull.* 407.
14. Sokolov H. (1930)—"The chromosomes in spermatogenesis of the goat," *Bull. Bureau Genetics and Eugenics*. 8: (1930) 63-86.

II. IN CATS.

Family.—Cats belong to the family Felidae.

CHROMOSOMES IN CAT

Pletnew S. A. (1941) reports diploid number of chromosomes in cat to be 38 and was confirmed by him in gonads.

Miuouchi, Osium and Takeo Ohta (1934) found 38 chromosomes in both spermatogonial and oogonial plates indicating XY complex in male and XX in female.

Winiwarter H. de (1935) reports that in a previous paper the number of chromosomes of the male cat was fixed at 35 (34 autosomes plus XY). Slides of Japanese cat's testis (sent to the author by Professor Ogunma) showed another formula of 38 (36 autosomes plus XY). He further states that different breeds of cats thus differ not only in the number of chromosomes but also in the heterochromosomal formula due to the presence or absence of Y chromosome.

Koller P. C. ((1941) reported diploid chromosome number in cat to be 38 and that the centromeres of the large chromosomes have a subterminal or submedian position; it is median in the smaller chromosomes. From the above cytological observation he suggested that the structural peculiarities of the sex chromosomes form the physical basis of the complex genetical behaviour observed in the tortoise-shell cat.

COAT COLORS IN GENERAL

The commonest colors of cats are tabby and black; but yellow, tortoise-shell, white and all colors combined with white are also quite common. Pale or dilute forms are:—

Blue (dilute black)
 Cream (dilute yellow)
 Tortoise-shell dilute
 Tabby dilute or maltese dilution
 Siamese dilution.

TABBY AND BLACK

Tabby pattern in domestic cats bears some resemblance to the coloring of the European wild cat. This is marked by alternate stripes of darker and lighter hairs, the lighter being Aguti (ticked) and the darker black.

Doncaster (1913) and Castle (1916), state that Tabby is dominant to Black.

Whiting (1918) gives the first detailed report of matings between Tabbies and Black and between Tabbies X Tabbies. His results strongly support the idea that Tabby is dominant to Black. His suggestion was that Tabby is due to two separate sets of factors, one for *banding* and another for *ticking*.

(1) Banding—is due probably to triple allelomorphs.

B¹—Striped (Dominant)
 B—Lined
 b...Blotched (Recessive)

(2) Ticking appears to be due to three separate factors.

A¹—Much ticked
 A—Little ticked
 a—Non-ticked.

A is dominant to a, and A¹ is dominant to both; these may or may not be allelomorphic. With regard to ticking; he points out in 1918 that it includes two distinct grades of ticking, viz;

A^e—Extreme ticking

A^m—Much ticking.

The true relationship between the different grades of ticking however is not definitely settled.

SIAMESE BLACK AND TABBY

Tjebbs (1924) has published results of breeding experiments with Siamese, involving crosses with several different kinds of cats. A Siamese female crossed with Tabby male gave the following results in F₂ generation.

"5 Black, 2 Siamese—1 Dark Tabby and 1 Light Tabby."

The Black is obviously dominant. The Black of the Siamese is entirely a different character from ordinary black. Tjebbs emphasises that it is a deep chocolate black as distinguished from ordinary black.

BLACK YELLOW (SEX-LINKED) AND TORTOISE-SHELL

Whereas all other colors are found in males and females alike, the tortoise-shell coat color is confined almost exclusively to the females. Black as a rule breeds true and so does yellow. In crosses between black and yellow, female progenies are Tortoise-shell while males are black—or yellow. From the works of Doncaster (1904), Little (1912), Bonhote (1915) and Whiting (1915), the following results are reported.

(Matings)

(Progeny)

Black female X Yellow male—Black males & Tortoise-shell females.

Yellow female X Black male—Yellow males & Tortoise-shell females.

Tortoise-shell female X Black male—Black & Yellow males and
Black & Tortoise-shell females.

Tortoise-shell female X Yellow male—Yellow & Black males and
Tortoise-shell females.

Thus Black and Yellow breed true and Tortoise-shell is the heterozygous form from Yellow X Black but normally occurs only in the females.

In regard to the exceptional Tortoise-shell in males various workers have put forth their claims thus.

- (1) That Black and Yellow are both sex-linked and are allelomorphs.
- (2) That both are sex-linked but are not allelomorphic, Black being present in all X—gametes, one dose of yellow being epistatic to all Black in males and incompletely so in the females.
- (3) That Yellow only is sex-linked and that black is present in all gametes, one dose of yellow being completely epistatic to all black in males and incompletely so in the females.

It is a definite fact, however, that two Yellows mated together have occasionally given black in some offsprings; whereas there is only one doubtful record of two Blacks mated together having given Yellow in the offspring; this makes it probable that Yellow is epistatic to Black, unless of course they are a pair of allelomorphs.

Bamber R. C. (1931) furnishes a list of 14 known Tortoise-shell cats (including the 7 reported by Cutler and Doncaster in 1915) with data of fertility, as under.

"3 Fertile, 4 Sterile, 1 almost Sterile, 3 died unmated, 1 will not mate and 2 doubtful."

From the above it can be concluded that a Tortoise-shell tom-cat is almost sterile.

Bamber R. C. (1922) reports an interesting case of a Tortoise-shell cat which was found to be sterile. Anatomically he was typically male, but microscopic examination of the testis showed that there was a large amount of interstitial tissue between the right and left testis and well developed seminiferous tubules—but no spermatazoa.

Bissonnett T. H. (1920) reports in one case examined that if the embryonic testis in cats as in cattle develops a male hormone capable of causing sex reversal in female embryos receiving such hormone, the necessary mechanism for its transfer to such female is sometime realised and therefore partial sex reversal is possible. Further data are needed to decide this point and settle the question as to whether the Tortoise-shell tom cat may or may not be intersexual female with descended testis and even modified external genitalia. This however does not exclude the possibility of genetic intersexes among Tortoise-shell cats.

This question of sterility in tortoise-shell tom cats has been discussed by many authors including Doncaster, Bamber, Bissonnette, Little, Koller and others and for the purpose of brevity all their reports have not been included in this outline; however, it may be said that the structural peculiarities of the sex chromosomes form the physical basis of the complex genetical behaviour observed in the tortoise-shell cat.

MALTESE DILUTION

Black is dominant to Blue, and Yellow is dominant to Cream. The factor for Maltese dilution appears to be a simple recessive to the factor for full color. This is entirely separate from the color factors and can be transmitted independently; thus, Cream color can be obtained by mating Yellow with Blue.

Doncaster (1904) after furnishing sufficient data points out that Maltese dilution is not sex-linked.

TABBY AND YELLOW

The inter-relationship between Tabby and Yellow in inheritance is of special interest because it combines the problems of inter-relationship between Black, Yellow and Tortoise-shell, and between several factors producing Tabby. Very little work has been done on this subject and the results are incomplete.

SIAMESE

Siamese cats have usually peculiar colored bodies with the face, ears, feet and tail a dark chocolate brown; their eyes are an opalescent blue. They are born white, and the pigmentation appears later, in about two weeks. Tjebbes (1924) describes a cross between a Tabby and Siamese giving

a new variety of progeny—a striped Siamese Tabby marking, in place of the Siamese Black. In the light of all the facts reported by different workers it appears that solid white is dominant to Siamese and that the Siamese coloration is due to a factor for chocolate-black combined with a factor for Siamese dilution. The inheritance of "Chocolate black" color is not understood.

SILVER AND SIAMESE COLORS

Silver and Siamese colors of the domestic cat are due to allelomorphous genes corresponding respectively to the Chinchilla and Himalayan members of the albino series in other animals.

WHITE AND WHITE SPOTTING

White spotting is apparently dominant to self color and there is every grade of white spotting from self color to solid white (Whiting 1919).

Doncaster (1904) while discussing black, yellow, and tortoise-shell colors in cats states that a certain amount of white is associated with these colors and reappears in the offspring without affecting the inheritance of other colors. He says that the piebald character appears to be due to separate allelomorphs as in rats and mice.

Whiting (1919) records the results of crosses involving white spotting and self colors. He suggests the following scheme of inheritance of quadruple allelomorphs.

W	——	A solid white, an extreme case of spotting.
w ^m	——	Much spotted.
w ^l	——	Little spotted.
w	——	Solid color.

Clearly white spotting appears to be dominant to self color but, in regard to the inheritance of degrees of spotting, more facts are required before any scheme could be accepted.

White.—Solid white is apparently dominant to all colors. Certain strains breed true but white cats may carry any color and so produce a great variety of offspring.

Jones (1922) records on the observation of 102 foetuses from white females that more degenerating foetuses were found in white cats than in non-white cats. The inference may therefore be drawn that the factor for whiteness is to a small degree lethal.

Coat color in Burmese cats.—Thompson, Coble, Keelar and Madeleine Dmytryk (1933) give the following description of the Burmese cat color.

1. The Burmese is a distinct, new coat color variety of the domestic cat, having a sound genetic basis, in that Dark Burmese will breed true.

2. The Burmese coat color is based upon the possession of a pair of Burmese genes (dark color phase) or of a single Burmese gene and its Siamese gene allele (light phase).

3. Burmese and Siamese genes are sharply contrasted in their colour.

4. The Burmese gene represents a 4th identified allele in Albino series which, naming the genes in order, are as follows:

- (a) Normal intensity (Tabby or Black)
- (b) Silver (Smoke)
- (c) Burmese
- (d) Siamese.

CORRELATION BETWEEN WHITE COAT COLOR, BLUE EYES AND DEAFNESS

Completely white cats often have blue eyes in which case they are also usually deaf but entirely white cats with yellow eyes are by no means uncommon and their hearing is usually normal. Sometimes one eye is blue and the other yellow and in that case the ear on the blue side is generally deaf whereas the ear on the yellow side is normal. The correlation holds equally well in both sexes. Although many workers including Bree (1828), Sichel (1847), Darwin (1859), Tait (1873), Bateson (1909), Pocock (1911), Wright (1918), Whiting (1918) and Tjebbes (1924) have reported on this condition, we have no knowledge yet of what causes the close correlation between blue eyes and deafness.

Eyes color.—Yellow eyes and gray (or green) eyes are common among ordinary cats. Blue eyes and odd eyes have received a little more attention but the recorded breeding experiments are few.

Przibrow (1907) reports on experiments carried out to study the inheritance of odd eyes in white cats and concludes that asymmetry of eye color is heritable and that the color of either eye of an asymmetrical pair can be inherited in both eyes of the offspring but asymmetry as such does not appear to behave as a simple Mendelian character.

Tjebbes (1924) gives very full details of the inheritance not only of eye color, but also of the exact distribution of pigment in different parts of the iris.

Bamber R. C. (1927) reports that the Siamese opalescent blue eye color is correlated with the Siamese coat color and we have some indication

that both may be due to a Siamese dilution factor recessive to the factor for full pigmentation but we do not at all understand the color factors on which this dilution factor acts.

Character of coat other than color, particularly the long haired Angora character.

There are different varieties of coat amongst cats. Darwin (1868) points out that in Mombassa (East Africa) the cats have short stiff hair instead of fur. Paraguay cats have short, shiny scant hair which lie close especially on the tail.

Marsh (1883) records a thick furred breed in the Arctic island of St. Paul.

Lydekker (1895) records thick furred cats which lived in the refrigerators of Pittsburgh.

Nothing is known however of the behaviour in inheritance of any of these characters.

MEXICAN HAIRLESS CAT

The Mexican hairless cat, described and figured for the fancy by Lane (1903) seems to be a distinct breed with practically no hair except the whiskers. Nothing is known of these cats except that they breed true.

PERCIAN OR ANGORA COAT

The long haired "Percian or Angora" coat is known to be inherited and is generally accepted as a simple Mendelian unit character recessive to the short haired character.

Many workers have reported that Angora character disappeared in a cross with a short haired one but reappeared in successive matings.

MORPHOLOGICAL CHARACTERS

Polydactylism.—The extra digits may occur on both fore and hind feet and the number varies in different individuals. Two feet or a pair may also differ. This condition is known to be hereditary and behaves as a dominant to the normal condition but every degree of polydactylism may occur in one family and the details of the inheritance are entirely unknown.

Tails, especially "Manx".—Darwin (1881) states that cats from Malayan Archipelago, Siam, Pegu and Burma have truncated tails about half of the proper length often with a sort of knot at the end. He also says that the cats of the Isle of Man have no tail. The latter condition has been reported by several other workers.

Externally a Manx has no tail but several caudal vertebrae are present underneath the skin. Crosses between Manx cats and long tailed cats give kittens with every conceivable length of tail from apparent absence to full length but the tailless factor is apparently dominant to the long tail.

ARRESTED DEVELOPMENT OF THE LONG BONES OF THE FORELIMBS IN A FEMALE CAT

This defect occurred in an otherwise normal black female cat, in its dam, great dam and some of the female progeny (when inbreeding occurred). The height from croup to ground was $9\frac{1}{2}$ inches and that from shoulder to ground $6\frac{1}{2}$ inches—the thoracic region standing barely $1\frac{1}{2}$ inches from the ground, (W. Jones 1944).

This condition appears to be hereditary and linked with the black color and is recessive to the normal.

UNIT CHARACTERS OF CAT

Dominants stand to the left of their recessives.

1. Black (of Siamese), Tabby, Ordinary black.
2. Yellow, Non-Yellow.
3. Intense, Dilute (Blue, Cream).
4. Full color, Siamese (an Albino allelomorph).
5. All White, spotted, uniformly colored.
6. Short hair, long hair (Angora).
7. Short tailed (Manx), Long tailed.
8. Polydactyly, Normal toes.

REFERENCES.

1. Bamber, Ruth C. (Mrs. Bisbee): "Genetics of Domestic Cats". *Bibliographia Genetica deal*; III: 1-87. 1927.
2. Bissonnette T. H. 1928: "A note on the occurrence of fused placentae in cats," *Journal of Heredity* 19: 87-89.
3. Bamber R. C. 1922. "The male tortoise-shell cat," *Journal of Genetics* XII 209-216.
4. Bamber R. C. and B. G. Herdman 1927. "Dominant black in cats and its bearing on the question of tortoise-shell males. *J. of Genetics* 17: 207-209.
5. Bascom K. T. 1923. "The interstitial cells in the gonads of cattle with special reference to their embryonic development and significance," *Am. Jour. Anat.* 1931;
6. Bissonnette T. H. 1924. "The development of the reproductive ducts and canals in the freemartin with comparison of the normal," *Am. Jour. Anat.* 33: 267-345.
7. Bissonnette T. H. 1926. The "High flanker" tests in cattle with its bearings on the problem of the scrotum and on that of the freemartin testis", *Anat. Rec.* 33: 47-58.
8. Bonnevie K. 1925. "Intersexualitat bei Schildpattfarbigen Katzen Roux" *Archiv. f. Entwick. der Organismen.* 100: 611 641.
9. Doncaster L. 1920. "The tortoise-shell: tom—cat. A suggestion," *Jour. of Genetics* 9: 335.

10. Hartman C. G. 1920. "The freemartin and its reciprocal opossum, Man, Dog." *Science* 52: 469-471.
 11. Hughes W. 1927. "Sex intergrades in foetal pigs". *Bio. Bulletin* 52.
 12. Keller K. and J. Tandler 1916 "Ober das Verhalten des Eighautes bei der Zwillingsstreichtigkeit des Rindes." *Wiener Tierarztliche Monatschrift* 12.
 13. Lillie F. R. 1917. "The freemartin: A study of the action of sex hormones in the foetal life of cattle". *J. Exp. Zool.* 23: 371-451.
 14. Lillie F. R. 1923. "Supplementary notes on twins in cattle," *Biol. Bull.* 44: 47-78.
 15. Oshima H. and J. Oyama 1925 cited by Bonnevie. *Zool. Bericht. Bd. 7, H. 8.*
 16. Little C. G. 1920. "Is the tortoise-shell tom cat a modified female." *J. of Genetics* 10: 130.
 17. Tjerboes K. and Wreidt C. 1926. "Dominant black in cats and its bearing on the question of tortoiseshell males." *J. of Genetics* 17: 207-209.
 18. Plutnew S. A. (1941) *Academy of Science U.R.S.S./N.S.* 31: 491-493.
 19. Minouchi, Osamu Takeo Ohta and Winiwarter H. de. *Cytologia* 5 (3) 355-362.
 20. Koller P. C. (1941) "The genetical and mechanical properties of sex chromosomes." *Pro. Royal Soc. Edinburgh* 61: 1941-43.
 21. Thompson, Coble, Keeler (1933) *J. of Heredity* 34: 119-123. "Burmese coat color."
 22. Williams Jones, H. E. "Arrested development of the long bones of the forelimbs in a female cat". *Vet. Record* 56: 449, 1944.
- Lethal characteristics.
23. Jones E. E. "Embryos of homozygous whites die in uterus." *J. of Heredity* 13: 237-239, 1922.

THE OCCURRENCE OF CONTAGIOUS CAPRINE PLEURO-PNEUMONIA IN ASSAM*

BY

V. R. GOPALAKRISHNAN, G.M.V.C., P.G., (Muktr.).

Veterinary Investigation Officer, Assam, Gauhati.

Introduction.

The occurrence of caprine pleuro-pneumonia has been reported from several provinces of India in recent years and there is evidence that it is one of the most serious diseases affecting goats, with devastating effects. It is, in fact, a potential menace to the goat-breeding establishment, especially now, when the economic value of goat is fairly well recognised in this country. Recent investigation of outbreaks of goat-diseases in this province furnished evidence of the existence of contagious pleuro-pneumonia, a condition new to Assam. Observations in the field, transmission experiments and laboratory tests revealed features of the specific pneumonia of goats first described by Longley (1940) in Madras. This work was carried out in collaboration with the Imperial Veterinary Research Institute, Mukteswar, and the investigation owes its origin to the Disease Investigation Scheme partly subsidised by the Imperial Council of Agricultural Research, India. Results of investigation

*Paper presented to the Indian Science Congress, Delhi, 1944

and particulars of outbreaks in two localities—one in Sylhet Farm and the other in a Military Camp near Gauhati—are recorded in this paper.

A perusal of available literature on the subject indicates that various forms of pneumonia of diverse etiology occur among goats in this country. While discussing the etiological factors concerned in pleuro-pneumonia of goats, Shirlaw (1939) reported that verminous pneumonia due to *Varestrongylus pneumaticus* was commonly met with. Further, he pointed out that there were more than one type of pneumonia including the types of infection in which *Corynebacterium*, *Pasteurella* and *Streptococci* were encountered and also indicated the possibility of a virus as the causal agent. Longley (Loc. cit.) described the occurrence of Contagious Pleuro-pneumonia of goats in Madras Presidency as a specific epizootic and gave experimental evidence for his suggestion to designate the etiological agent as *Borrelomyces peripneumoniae capri* which was closely related to that of a similar disease in bovines. Pande (1943) isolated an organism of the *Pasteurella* group from the vital organs of affected goats in an enzootic outbreak of pleuro-pneumonia in a goat-breeding farm in the United Provinces and observed that the role of *Pasteurella* organism as a causative factor of the outbreak has been established. On the other hand, while describing pasteurellosis in sheep and goats in the Bombay Presidency, Naik (1939) referred to the typical and diagnostic lesions of hepatisation of lungs as a *post-mortem* feature. However, it would appear that some confusion exists regarding the various goat diseases manifested by pneumonia and further work is obviously necessary to sort out and classify them properly.

OUTBREAK IN THE SYLHET FARM

Since the middle of September 1942, Military authorities have been purchasing goats from local contractors and maintaining them in the Government Cattle Breeding Farm, Sylhet, as there was facility for grazing in the farm premises. Hundreds of goats from the rural areas of Sylhet district as well as from the neighbouring districts of Mymensingh and Tipperah of Bengal, were obtained and stocked in the farm. It was reported that new purchases were usually mixed up with the flock and according to the requirements, goats were despatched to the Army units stationed in places such as Silchar, Shillong etc. Almost daily, purchases and despatches of goats were carried on.

The first batch of goats was kept in the farm on the 14th September 1942; subsequently more batches were included. It was reported that deaths among goats was observed by about the 20th September and later on more deaths occurred. At the time of investigation on the 8th October 1942, the total number of goats was about 1,500; 56 had already died and more than a hundred were sick with about twenty of them seriously. Cattle and buffaloes in the farm were unaffected. As large numbers of goats were

despatched to Silchar, Shillong, etc., reports of outbreaks of pleuro-pneumonia were also received from these places.

SYMPTOMS

Dullness, impaired appetite, staring coat and discharge from eyes and nose marked the early stage. There was fever, temperature ranging from 104 to 106°F and the animals were crouched or tucked up in appearance. These were followed by respiratory symptoms. Occasional cough and mucopurulent discharge from nose, were noticed. Development of pleuro-pneumonia was evident on percussion and auscultation. Breathing was hard and laboured. Corneal opacity was seen in a few cases. Abortion occurred in most of the pregnant ones. Diarrhoea was occasionally observed.

Affected animals died in the course of 5 to 10 days and the mortality was about 75 per cent. Goats of either sex were equally affected; the victims being mostly among adults.

POST-MORTEM FINDINGS

Post-mortem lesions were characteristic and similar to those observed in Contagious Bovine Pleuro-pneumonia in Assam. In the cases examined, one or both the lungs were found affected. Thoracic cavity contained about 200 to 300 c.c. of pleuritic effusion which coagulated in a short time. Pleura appeared thickened and congested. Lungs were congested and the more grossly affected areas showing advanced lesions, were consolidated, firm, hard and adherent to the thoracic wall. There was evidence of hepatization and cut-surface presented to a certain extent, marbled appearance though not so typical as in the case of Bovine pleuro-pneumonia. A layer of fibrinous deposit, faintly yellow, translucent and about half an inch in thickness was usually seen on the adherent surface of the lung and pleura. Lymph glands were oedematous, swollen and slightly congested. Pericardial sac contained serous effusion, some times as much as 40 c.c. Petechiae were observed on the myocardium. In one or two cases that had diarrhoea, a few congested patches were observed in the abomasum and small and large intestines.

LABORATORY FINDINGS

Examination of blood smears of affected cases was negative for any specific organism. Similarly, microscopical examination of materials from post-mortem cases was also negative. In one case, rare bipolar organisms were seen in the lung smears. Suitable material was collected for experimental work at Gauhati as well as for sending to the Imperial Veterinary Research Institute, Izatnagar. Pieces of affected lung, lymph gland, fibrinous deposit, lung juice and pleural exudate were sent packed in ice in a thermos

The Occurrence of Contagious Caprine Pleuro-Pneumonia in Assam 193

flask. The result of examination at the Imperial Veterinary Research Institute, Izatnagar, as reported, is given below :—

" * * * Four goats were experimentally tested with the pleural exudate and lung juice. Two goats were intra-nasally insufflated and remained healthy over an observed period of 27 days. Two goats were subcutaneously inoculated with the same material: one remained healthy over the same period, the second developed a local swelling and fever on the 5th day and died on the 11th day with lesions suggestive of Rinderpest. [I therefore, sent material from this goat to Mukteswar for a biological test for Rinderpest and am now informed that the test was negative.]

The disease that you describe is highly suspicious of the form of pneumonia in goats described in Madras Presidency. If this suspicion be correct, it should be possible to produce pleuro-pneumonia-like lesions (as you have seen when you were working on contagious bovine pleuro-pneumonia) following the inoculation of 2-5 c.c. of fresh pleural exudate subcutaneously at the point of the shoulder in healthy goats. It will be necessary to inoculate 2-3 goats as goats taken at random may have some immunity through previous contact with the disease. * * * "

TRANSMISSION EXPERIMENT

Fresh material obtained post-mortem at Sylhet was packed in ice in a thermos flask and brought to Gauhati. Due to the prevailing war conditions much difficulty was experienced in obtaining animals for the experiment and there was unavoidable delay of seven days in inoculating the material. Two goats and one heifer were inoculated subcutaneously with 5 c.c. of pleural exudate and pneumonic lung emulsion on 16-10-42. About 5 c.c. of the emulsion was also administered intra-nasally to the goats. It may be mentioned that experimental work was not undertaken at Sylhet, as the disease had spread in the town area not only among goats but also among sheep. This is due to the practice of keeping the goats in the town before being purchased by the Military authorities.

Reaction :—

There was gradual rise of temperature in the goats up to about 10 days; subsequently it came to normal. The maximum temperature was noticed on the sixth day in both the goats i.e. 104.2 and 105.2°F and both of them showed swelling at the site of inoculation. The local swelling gradually increased in size upto the 10th day. It was hard and painful but not very extensive. There was no tendency for abscess formation and the swelling almost completely disappeared in about a month. Slight inappetence, a little dullness, nasal discharge and an occasional cough, were observed during the first week or so and later the goats appeared normal.

The heifer, however, remained quite healthy and normal throughout the period of observation extending to a month.

Immunity test :—

They were tested with rinderpest virus obtained from Calcutta on the 15th January 1943. Unfortunately, the heifer strayed away from the compound and could not be traced. The two experimental goats along with a healthy control, were tested. One experimental goat and the control died and *post-mortem* examination showed typical rinderpest lesions. The other goat reacted and recovered.

The results of rinderpest test indicate that the experimental goats were not immune against rinderpest. The thermal and the local reaction following the injection of the original material were suggestive of specific pleuro-pneumonia infection. A conclusive experimental evidence could not be obtained due to the unavoidable delay in conducting the transmission experiment. But in the other outbreak efforts made to reach substantial conclusions were successful.

OUTBREAK IN THE INDIAN CATTLE STOCK SECTION

An outbreak of the disease was reported among goats in the Indian Cattle Stock Section maintained by Military authorities in a camp about two miles from Gauhati and investigation was undertaken in the last week of January 1943. Hundreds of goats were received almost daily by rail and by steamer in the Section and a large number of them were distributed, according to requirements, to the various Army units. It was reported that disease was observed since November 1942, and deaths occurred at the rate of 10 to 15 per day with a maximum of 40 in one day. At the time of investigation, about 2,500 goats were in stock and they were obtained from United Provinces and Bengal. About 150 goats were found sick, of which 30 were advanced cases. The Officer in-charge said that several goats were ailing when they were received. It was also reported that during the early organisation of this section, local Assam goats were purchased in large numbers and there was no outbreak or death among them. But the demand could not be met by local supply and therefore goats had to be imported from outside. Disease prevailed amongst the imported goats.

LABORATORY FINDINGS

Symptoms were similar to those observed in the outbreak among goats in the Sylhet Farm. *Post-mortem* examination was conducted in cases, naturally dead as well as destroyed *in extremis*. The lesions were characteristic and similar to those found in the outbreak at Sylhet. Suitable material was collected for experimental work at Gauhati and for sending to the Imperial Veterinary Research Institute, Izatnagar. Examination of spleen

and heart blood smears was negative for any specific organism. Similarly microscopical examination of lung smears was also negative except in a few cases where rare bipolar organisms were detected. Preserved and unpreserved material sent to Imperial Veterinary Research Institute, Izatnagar, gave evidence confirming the disease tentatively diagnosed as Contagious pleuro-pneumonia based on field observations. Relevant extracts of the results of examination are given below :—

" * * * Histopathological examination of pieces of consolidated lungs revealed the features of the specific pleuro-pneumonia of goats first described by Longley in Madras.

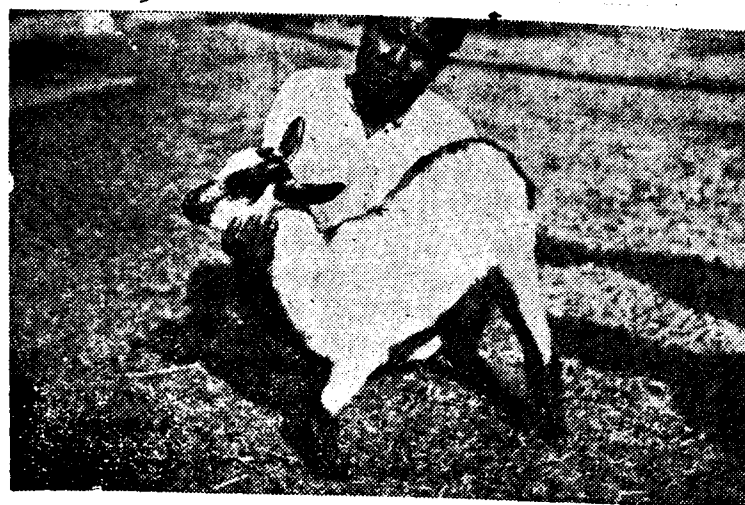
The pleural exudate was inoculated subcutaneously in two goats which showed a mild but decided thermal reaction. Two months later when they were tested for immunity with fresh Bombay strain of pleural exudate intra-nasally, they were found to be immune while the controls used in the test reacted typically and died of specific pleuro-pneumonia—thus showing that the Assam and Bombay strains of goat pleuro-pneumonia virus are etiologically and immunologically related."

" * * * Pathologically and histopathologically the portions of lung show changes of the type usually encountered in epizootic pleuro-pneumonia in goats."

" * * * The piece of local lesion conforms in type to the lesion induced in goats by the subcutaneous inoculation of our Bombay strain of goat pleuro-pneumonia virus. * * *". (This refers to the local lesion of Goat No. 1 of the first passage of the virus).

Experimental transmission :—

(a) Fresh materials consisting of pneumonic lungs, fibrinous deposit and pleural exudate, were collected from a natural case on 30-3-43. A saline emulsion of these materials was immediately made and inoculated into 4 local goats and 2 calves subcutaneously at the point of the shoulder, 5 c.c. each. All the goats reacted both thermally and locally. The temperature ranged from 105° to 106°F from the 3rd to 5th day. The local reaction was typical in the form of intense inflammatory oedema at the site of inoculation. It gradually extended down to the sternal region. The animal was going lame on that leg and it was usually kept raised (vide figure 1). The first goat died on the 6th day and the 2nd one on the 9th day. *Post-mortem* lesions were characteristic extensive oedematous swelling extending over the left shoulder and adjoining parts with pronounced serous infiltration of the subcutaneous and intramuscular connective tissue. Goat No. 2 showed similar local lesions and in addition congestion of the lungs and consolidation of the left lobe. A small quantity of pleural effusion was found in the thoracic cavity. Nothing unusual was noted in other organs.

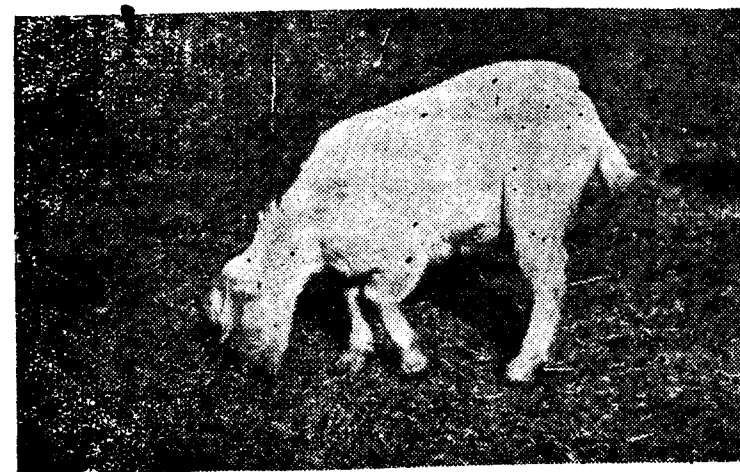


Local reaction in Goat No. 1. Fig. 1.

Heart blood and spleen cultures were sterile and blood smear preparations of vital organs were negative. The other two goats (Nos. 3 and 4) reacted and survived. The temperature came to normal in about a fortnight. The calves did not react and remained healthy and normal. The local swelling disappeared in the course of 4 to 5 days.

The strain of the virus from local lesion was serially passaged. Four passages were made by subcutaneous inoculation of goats and the local lesion was typical in all of them; besides, three of them aborted and one developed corneal opacity. The details are tabulated below:—

Goat No.	Date of subcutaneous inoculation.	Source of material.	Result.	Passage	Remarks.
Goat No. 1. Goat No. 2. Goat No. 3. Goat No. 4.	30-1-43.	Natural case.	Died, 5-2-43. Died, 8-2-43. Survived. Survived.	One	Aborted (No. 4)
Goat No. 7. Goat No. 8.	5-2-43.	Goat No. 1.	Survived. Died, 15-2-43	Two	Aborted (No. 8)
Goat No. 11. Goat No. 12.	15-2-43.	Goat No. 8.	Died, 23-2-43. Died, 23-2-43.	Three	Aborted. (No. 12)
Goat No. 13. Goat No. 14.	23-2-43.	Goat No. 12.	Died, 3-3-43. Died, 2-3-43.	Four	Corneal opacity (No. 14)



Local reaction in Goat No. 2. Fig. 2.

(b) An experimental trial to induce pulmonary lesions by intranasal administration of muscle juice and effusion was also made. About 10 c.c. of the muscle juice and serous infiltration obtained from the local lesion of goat No. 2 (1 passage) was administered intranasally on 8-2-43 to two goats, Nos. 9 and 10. Both of them reacted and died, goat No. 9 on 26th February and goat No. 10 on the 23rd February. Clinical symptoms were observed about a week after the intranasal administration and *post-mortem* lesions were typical of pleuro-pneumonia.

Immunity test against Rinderpest.—

The two calves that did not react to the original material inoculated on 30-1-43 were tested about six weeks later for immunity against rinderpest. They were inoculated with rinderpest virus on 15-3-43 along with 2 control goats. The calves reacted to the test thermally and clinically and recovered. The control goats reacted and succumbed. *Post-mortem* lesions were positive for rinderpest. Hence the probability of rinderpest infection in the outbreak was eliminated.

Susceptibility of sheep.—

To test the susceptibility, two local sheep were inoculated subcutaneously with the fresh material on 17-3-43. They reacted in the same way as the goats and one died on the 22nd March and the other on the 23rd March i.e., on the 5th and 6th day. *Post-mortem* lesions were also similar to those in goat. Sheep seem to be equally susceptible to inoculation as goats.

Treatment and Control

Control measures were adopted. It was suggested to stop the purchase of goats from infected localities particularly from outside the province and to keep under observation all new purchases for ten days. All the sick goats were segregated and kept in a separate shed. It was also advised to keep the healthy goats in small lots in separate sheds to avoid congestion. Disinfection of sheds with phenyle lotion and sprinkling of lime, burial, or, if possible, burning of carcasses and such other sanitary control measures were suggested.

Treatment was undertaken in goats in the early stage of the disease with Novarsenobillon—"N.A.B." (M & B), on an experimental basis. Fifteen cases were treated of which 11 recovered and 4 died. It may be mentioned in this connection that in 1941-42 experimental treatment with "N.A.B." was carried out in cattle in outbreaks of Bovine Contagious pleuro-pneumonia in Assam, (Gopalakrishnan, 1943). The results were encouraging. Hence this treatment was tried in goats also. The cases selected for treatment were in the early stage of the disease and were close-in-contacts with the sick ones. They appeared dull with nasal discharge and showed temperature ranging from 104° to 106°F. The dosage is 0.15 to 0.30 grm. of "N.A.B.", depending upon the size of the goat. Goats of average size are able to tolerate a dose of 0.30 grm. without any ill-effect. The solution is made in sterile distilled water in accordance with the instruction given in the pamphlet and is injected intravenously. In about 24 hours after the injection, temperature comes down almost to normal and a little improvement is observed in the following 2 or 3 days. If there is again a sharp rise of temperature after this period, another injection of "N.A.B." is indicated. In the treated cases, three goats were given a second injection on the 4th day after the first injection while the rest received only one injection each. Out of these three cases two recovered and one died. The recovered cases improved gradually in the course of about two weeks. Cases that did not respond to treatment died in 4 to 7 days. Cases that recovered were observed for about a month. From the experimental treatment with "N.A.B." it appears that the results are encouraging.

As the animals belonged to the Defence Forces in the province, the problem of control was discussed with the Army Veterinary officers who took much interest in the investigation of the disease. The following suggestions were made:—

For control of the disease, it would be of much benefit if action is taken at the source, that is, at the place where they are purchased as several goats were reported to have been ailing when they were admitted to the Section. Experimental trial of vaccination was suggested. The method was simple and consisted of inserting through a skin incision in the ear a

small fragment of the diseased lung from a natural case (Minett, 1942). The plan of experiment consisted of:—

- (a) about 10 to 12 local Assam goats will be vaccinated by this method;
- (b) they will be under observation for 15 days;
- (c) an equal number of local Assam goats will be obtained and these serving as healthy controls, will be added to the vaccinated lot and all of them will be kept along with the sick goats in the Sick-goat-pen at the Cattle stock Section;
- (d) they will be under observation for about three weeks to study the degree of immunity.

The Army Veterinary Officers agreed to the suggestions and gave facilities for carrying out the experimental vaccination.

Vaccination.

A small-scale experimental vaccination was undertaken. As goats of the Indian Cattle Stock Section were obviously unsuitable for the test, local (Assam) goats were purchased. Twelve goats were vaccinated by inserting through a skin incision in the ear a small fragment of the diseased lung from a natural case. The material was freshly obtained from the Cattle Stock Section and vaccination was carried out on the 20th February 1943. Three controls were kept; two goats were inoculated subcutaneously and one intranasally with the pneumonic lung emulsion.

Reaction:—

All the goats were kept under observation for two weeks, and their thermal and local reactions were observed. There was a rise of temperature of about 3 degrees in all the vaccinated goats from the 3rd to 5th day and then it came to normal after a week. Local swelling and tenderness were noticed for about a week. Appetite was not much impaired as they were grazing about and feeding fairly well. One goat died on the 2nd day of inoculation of an intercurrent infection (worm infection). Two goats died on the 7th and 8th day apparently as a result of the reaction. Congestion of the lungs was observed but there was no pleurisy or effusion. The control goats died; two of them with typical local reaction on the 6th and 8th day and the third goat with pleuro-pneumonia lesions on the 16th day.

Immunity test:—

(a) Immunity test was carried out by keeping the vaccinated goats along with an equal number of healthy local goats in intimate contact with natural cases that were actually ailing in the Sick-goat-pen of the Indian

Cattle Stock Section. This procedure, it was thought, would indicate the immunising value of the method of vaccination adopted and also the degree of susceptibility of local goats to infection by contact, which apparently is the main mode of spread of the disease. A fortnight after vaccination i. e. on 7-3-43 the nine vaccinated goats and nine healthy ones (healthy controls) were transferred to the Cattle Stock Section and were kept in contact with about 100 sick goats in the Sick-goat-pen. Feeding and watering were the same for all of them and they were grazing together in the enclosed area attached to the pen. They were under observation for about two weeks.

Result :—

Out of the nine vaccinated goats, four died within three days of contact—two on the 8th March, one each on the 9th and 10th March and post-mortem examination indicated that they died of an intercurrent infection (worms). On the 8th day of contact, one more died in which pneumonic lesions were observed but there was no pleuritic lesion. Four of the vaccinated goats survived.

Among the control goats, one died on the 5th day of contact. Post-mortem lesions indicated that it died of intercurrent infection (worms) as no lung lesions were noticed. The remaining eight goats died, two on the 7th and three each on the 8th and 9th days of contact. All of them showed typical pleuro-pneumonia lesions.

(b) Another immunity test was carried out. While vaccinating 12 goats on the 20th February 1943, there were at that time two goats (Nos. 3 and 4) of the first passage of the virus, that had reacted and recovered. They were tested, three weeks after the primary inoculation, by intranasal administration. They remained healthy and normal over an observed period of one month. The control goat reacted and died of typical pleuro-pneumonia. The controls were common for this test and for the vaccination. It is therefore evident that recovery after the subcutaneous inoculation of the material, confers immunity against the infection.

Discussion.

For the vaccination experiment, local Assam goats were used. They were shown to be highly susceptible to the infection by contact as eight out of nine goats died showing typical lesions of pleuro-pneumonia. Among the twelve vaccinated goats two died due to reaction following vaccination and one due to intercurrent infection. When the remaining nine goats were kept in contact with the sick goats, four of them died of intercurrent infection, one succumbed to pneumonia and the remaining four survived. When local goats are used for experimental work, it has been the experience that some of them die of intercurrent infection. This is mainly due to

helminthic infestation that is fairly heavy in Assam. The method of vaccination is simple as compared with other methods wherein formalised or carbolised vaccine is used. In the experiment, the goats were vaccinated with fresh virulent material. As the disease has not so far been known in Assam, it is likely that the goats will be highly susceptible; and so it proved in the test, and three of them died after vaccination. It may not be the same with the imported goats as they may have some immunity through previous contact with the disease. Hence for control of the disease, this method of vaccination is worthy of trial as it is likely to prove beneficial.

Successful transmission experiments have been made in healthy goats while experimental reproduction in cattle was unsuccessful. Similar observations have been recorded by other workers (Mettam, 1929 and Longley, 1940). Conversely, in the experimental work on Bovine Contagious Pleuro-pneumonia (Gopalakrishnan 1943), it was found that the disease could be reproduced only in cattle and not in goats. It, therefore, seems evident that the causal agents of caprine and bovine pleuro-pneumonia, though closely related and belonging to the same group, capable of manifesting a pathological condition apparently similar in the two species of animals, are different types possessing species specificity.

In a few cases, bipolar micro-organisms were detected in the affected lungs. But in the transmission experiments, examination of vital organs of affected goats did not reveal any significant organisms although reproduction of the condition was successful. Hence the presence of bipolar organisms apparently of the pasteurella group, is considered to be secondary or terminal invader. It is worth referring in this connection to the role of a pasteurella organism as a causative factor in the outbreak of pleuro-pneumonia of goats mentioned by Pande (1943). Actually it appears to be an outbreak of Pasteurellosis or Haemorrhagic Septicaemia of goats in which the affected animals displayed manifest symptoms of pleuro-pneumonia. Although Hueppe (1886) and other workers earlier stated that pasteurella organisms isolated from different animals possess certain common characters and are therefore believed to be variants of one basic type, later observations indicate that there is not only difference in their pathogenicity but also much difficulty in their classification (Cornelius, 1929; and Topley and Wilson 1937).

Summary and conclusions.

Details are given of investigation of Contagious Pleuro-pneumonia of goats in Assam and of the occurrence of the disease as a specific epizootic. Full particulars relating to source of infection, nature of outbreak and localities affected are given.

Symptoms, course, post-mortem lesions, means of control and treatment are described. Infection is generally confined to goats. Mortality is high viz. 70 to 80%.

Successful transmission experiments with fresh lung exudate and serial passage of the virus by subcutaneous inoculation of muscle juice from local lesion have been made in the healthy goats at Gauhati. Further, induction of pulmonary lesions by intra-nasal administration of muscle juice from local reactions, has been accomplished. Sheep are susceptible to inoculation. Cattle appear resistant to natural infection and experimental inoculation.

Experimental vaccination by inserting through a skin incision in the ear a small fragment of diseased lung from a natural case and immunity test of vaccinated goats were carried out. Results were encouraging. Methods of vaccination for control of the disease are discussed.

From field observations in Assam and laboratory findings at the Imperial Veterinary Research Institute, Mukteswar, there is substantial evidence that the disease, a specific infection apparently hitherto unrecorded in this part of the country, is Contagious Caprine Pleuro-pneumonia caused by *Borrelomyces peripneumoniae capri* (Longley 1940).

Acknowledgments.

The author wishes to express his sincere thanks to the Army Veterinary Officers at Gauhati for their help and facility. To Mr. J. F. Shirlaw, M. R. C. V. S., Imperial veterinary Research Institute, Mukteswar, the author acknowledges his indebtedness for the examination of specimens and for suggestions offered. The author wishes to place on record his gratitude to Mr. A. K. Mitra, M. R. C. V. S., Director of Veterinary Department, Assam, for his keen interest and encouragement.

References

- Cornelius, J. T. (1929) *J. Path. Bact.* 32, 355.
 Gopalakrishnan, V. R. (1943). *Ind. J. Vet. Sci.* Vol 13, 287.
 Hueppe, F. (1886) *Berl. Klin. Wsch.* 23, 776.
 Longley, E. O. (1940). *Ind. J. Vet. Sci. & Anim. Husb.* 10, 127.
 Mettam, R. W. M. (1929). *Bul. Bo. 8E, Dept. of Agri. Kenya.*
 Minett, F. C. (1942). *An. Rep. I.V.R.I. (1940-41)*, 18
 Naik, R.N. (1939). *An. Rep. V.I.O, Bombay (1938-39)* 7.
 Pande, P. G. (1943). *Ind. J. Vet. Sci. & Anim. Husb.* 13, 44.
 Shirlaw, J. F. (1939). *Proceedings, 3rd Amin. Husb. Wing Meeting, New Delhi*, 136.
 Topley, W.W.C. and Wilson, G. S. (1937) *The Principles of Bact. and Immunity* 2nd Ed.

RINDERPEST AND ITS CONTROL IN THE PROVINCE OF BOMBAY.*

BY

R. N. NAIK, G.B.V.C.,

Bacteriologist and Veterinary Investigation Officer, Department of Veterinary Services, Province of Bombay.

Rinderpest has been prevalent in the Province of Bombay, in an apizootic form for a very long period, probably even during pre-historic times, as the original home of the disease has been known to be Asia. But no specific data are available about the disease, its nature and course, before the advent of the Britishers in India. Since then, it has been receiving serious attention. The Civil Veterinary Department, Bombay, was formed in the first instance with the sole object of combating this disease which among all diseases of cattle, always ranked first in causing an appalling mortality in the affected villages. A study of the statistical record of the incidence of the disease in the various districts of this Province during the last 25 years shows that there was not a single year during which this Province was free from it. In the majority of districts it was prevalent almost continuously while, in others, it was absent for periods extending up to three years. During certain years, the disease broke out very extensively and caused very heavy mortality, while during certain other periods the disease remained confined to certain areas without becoming very wide-spread and caused only a smaller number of deaths. (A map showing the mortality of cattle and buffaloes due to the disease breaking out enzootically is given in Fig. 1). But the periods intervening the years when the disease assumed a wide-spread character varied in different districts. An increased number of susceptible animals made available by the addition of new births and of imported susceptible stock, movements of infected herds, weather conditions favourable for keeping the infective agent in a viable condition and the exalted virulence of the virus have been the main causes for the ready dissemination of the infective agent and for the wide-spread nature of the disease. It has been observed that the percentage mortality in certain outbreaks of an extensive nature varied to a certain extent, apparently due to varied virulence of the virus. At certain times, the virus caused high mortality both in cattle and buffaloes while, at other times, it was found to be more virulent to buffaloes than to cattle. It was also seen that sometimes the virus was of such low virulence that the disease ran a very mild course both among cattle and buffaloes, causing a low mortality and subsiding very quickly.

* Owing to paper shortage the article is condensed by the Editor, I. V. J.

The average recorded mortality of animals due to Rinderpest before the introduction of goat-virus vaccination in this Province was 12,468 per annum while the average total mortality from Haemorrhagic Septicaemia, Black quarter and Anthrax together was 5,799 only. The districts which suffered most heavily during the last 25 years were Dharwar, Kolaba, Thana, Kanara, Nasik, Ahmednagar, Belgaum, Poona and Ahmedabad. Mortality figures for the period of 25 years are illustrated in Fig. II.

Aetiology:—As is well known, the aetiological agent is a filterable ultra-microscopic virus. Plurality of virus has not so far been proved. The virus, however, shows a variation in virulence under natural and artificial conditions. Under field conditions one may come across virus strains possessing exalted, average and low virulence. By passing the ox virus in goats artificially, a strain of virus attenuated in virulence and free from Piroplasma organisms which are commonly present in ox virus can be secured (Edwards). Similarly by passing ox virus into sheep, a strain of virus exalted in virulence can be secured (Koch). Strains of rinderpest virus possessing different degrees of virulence exhibit different degrees in different species of animals. It is my experience gained while working as Assistant Veterinary Research Officer at the Imperial Veterinary Research Institute, Mukteswar that the virus maintained by passage into hill bulls and which is highly virulent to them shows a low virulence to the "plains" cattle of India while that collected from actual outbreaks of rinderpest prevalent in the "plains" cattle shows an exalted virulence to the hill cattle. Similarly in this Province the virus strain which causes heavy mortality among buffaloes shows a modified virulence to cattle, while that which is highly virulent to cattle is also highly virulent to buffaloes.

Animals Susceptible.—Rinderpest is naturally a disease of cattle and buffaloes, the latter being more susceptible to the disease than the former in this Province. The disease has also been authentically recorded in sheep and goats in one instance in the year 1938.

Symptoms.—Generally the disease is ushered in with a rise of body temperature, dry muzzle, dullness, suspended rumination, inappetence, congested mucous membrane and discharge from eyes and nose. These are soon followed by a husky cough especially heard at night, constipation and vesicles and ulcers in the mouth. In the next stage diarrhoea begins when the animal shows a great depression and emaciation and only a slight or no rise in the body temperature. The diarrhoea is offensive, profuse, congee-water like, and shooting. In the last stage, grinding of the teeth, great emaciation, prostration and involuntary evacuations which may become blood-stained are generally observed. The eyes get sunken, the respirations become shallow with a characteristic moan and the animal dies in a stage of coma. Mildly affected cases show a modified series of symptoms

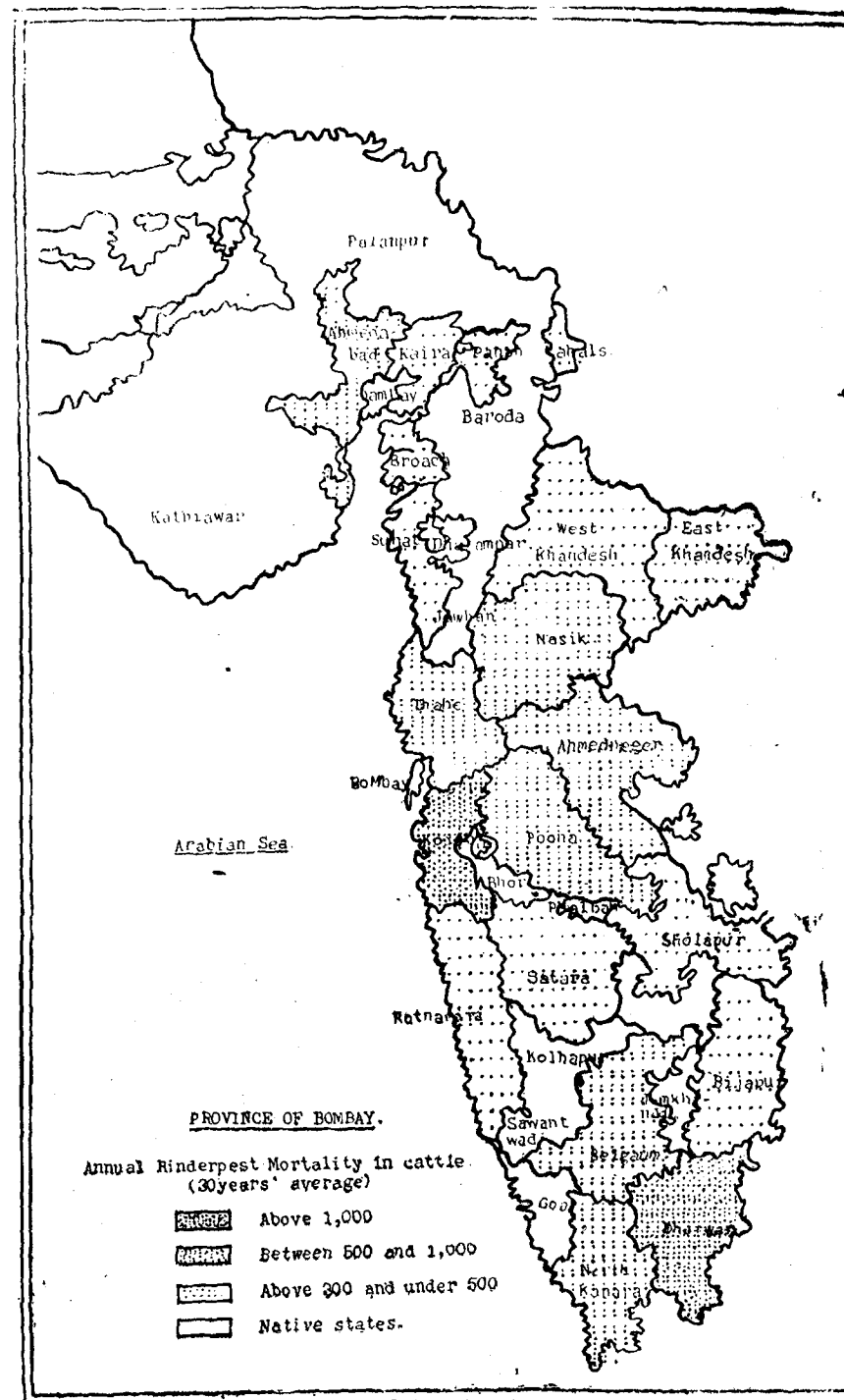


Fig. I

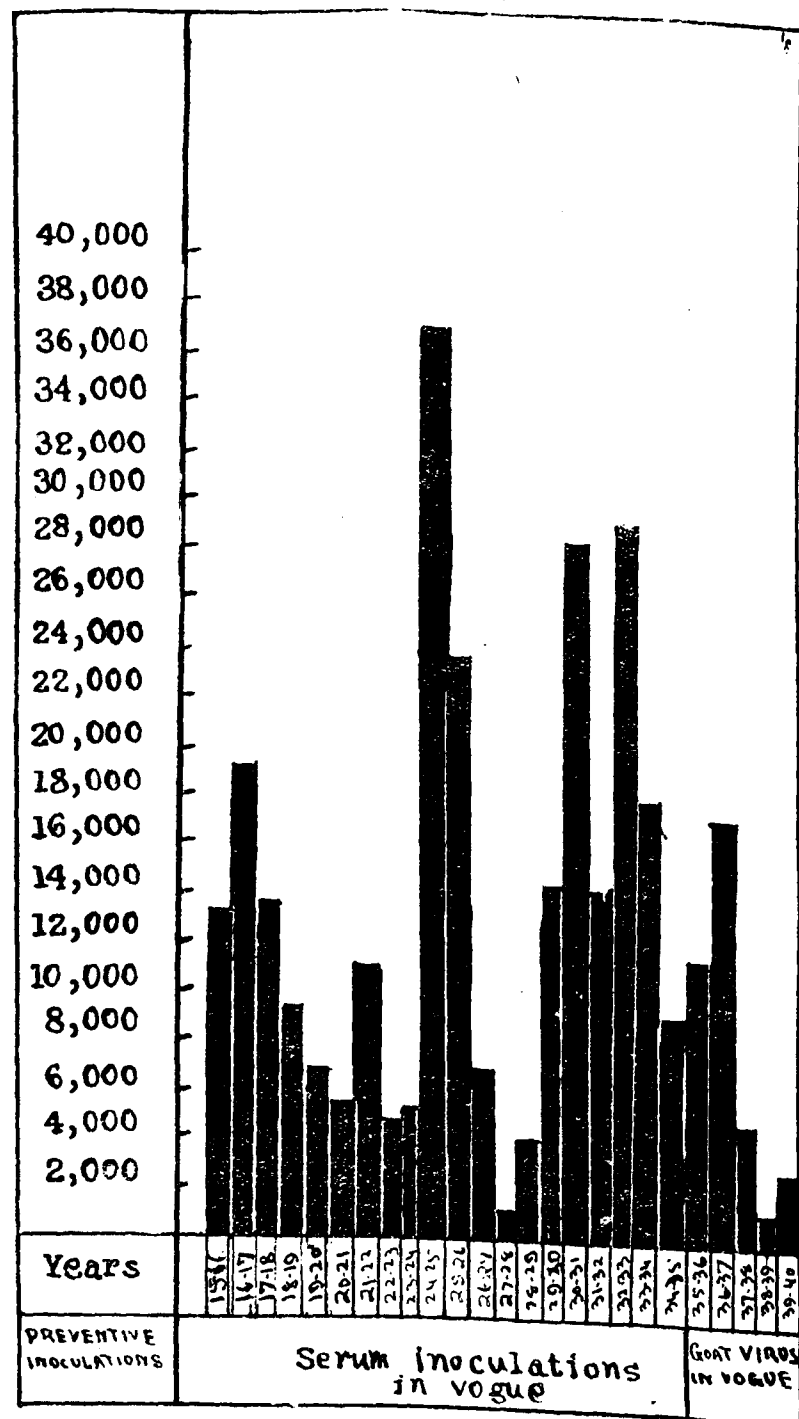


Fig. II.—Mortality by Rinderpest
1915-16 to 1939-40

in the first two stages and recover. Severely affected cases generally die in the acute stages although, in a few, the course may be extended for some days before death occurs. Pustular dermatitis has been noticed in some of the severely affected buffaloes and, if at all they recover, exfoliation of the epidermal tissue occurs in them. Reduction in the milk yield of milch animals and abortion in pregnant animals occur invariably in all affected cases.

Course.—The course of the disease amongst "Plains" cattle is much longer than in "Hill" cattle and may ordinarily extend to 12 to 20 days. In buffaloes, it is generally shorter than in cattle. When the outbreak is mild, the affected cases recover in 7 to 12 days.

Complication.—In this Province, complications with Piropasmosis, Theileriasis and Coccidiosis have been very frequently observed and it is opined that the high rate of mortality observed in certain areas of this Province which are heavily infested with ticks is due to the complication with intracorpuseular protozoan organisms.

Treatment.—There is no specific treatment for the disease. But it has been found out by systematic trials that Lugol's solution, injected intravenously at 200 c. c. per 600 lbs. body weight, effects a cure in Rinderpest cases in the early and middle stages of the disease. Temperature charts of four selected animals (Figs. III, IV, V and VI) which were subjected to the Iodine solution treatment and which belonged to the American Mission Dairy, Kedgaon Poona, are attached.

Prevention.—In this Province, the 'serum-alone' method of inoculation against the disease was introduced at the beginning of the current century. The immunity conferred by this method of prophylaxis was only about 9 days; but as there was no other biological product of practical value suited to the rural conditions of this country, the Department of Veterinary Services had then to rely upon it alone for combating the outbreaks of the disease. It must be admitted that the Department did succeed in cutting short the outbreaks mainly due to the indefatigable efforts of the Veterinary Assistant Surgeons who without minding personal troubles and the taunts of the recalcitrant people spared no pains in pushing on the inoculations repeatedly every ninth day until the outbreaks subsided. During certain years when the epizootic was wide spread, the figures for inoculations went as high as 1,50,000. It is, indeed, a glorious achievement which history will bear for ever, that the staff of the Civil Veterinary Department put such a hard fight against the periodic invasion of this fell disease in order to save the cattle of the country and to prevent economic loss to cultivators.

From the year 1921 onwards, attempts were made to introduce 'serum-simultaneous' method of inoculation using hill-bull virus. Animals

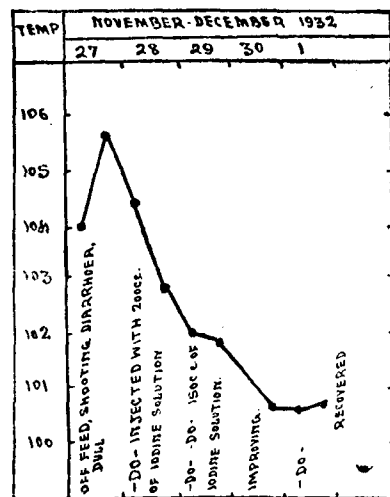


Fig. III.

Buffalo-cow, Ghari, 7 years, treated with Lugol's solution.

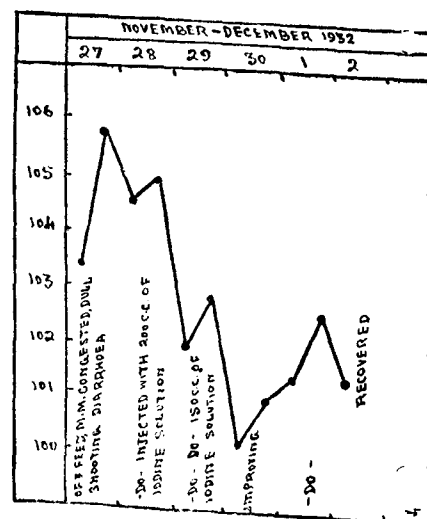


Fig. IV

Buffalo-cow, Mukran, 6 years, treated with Lugol's solution.

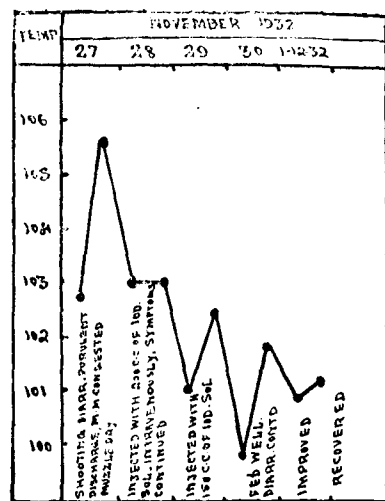


Fig. V

Buffalo-cow, Badami, treated with Lugol's solution.

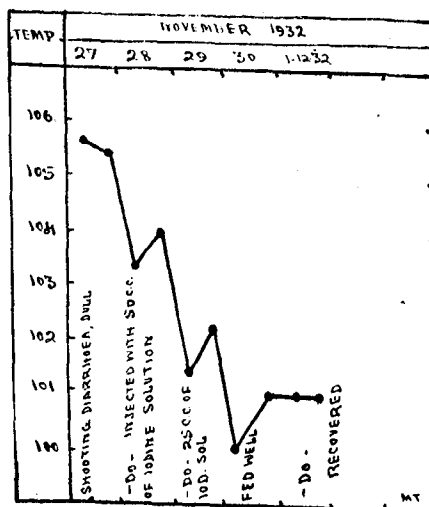


Fig. VI

Buffalo-bull calf, Laxya, treated with Lugol's solution.

belonging to a few dairies and cattle-breeding establishments were protected against Rinderpest by this method. But the progress made was very much limited as this method did not permit its free use under village conditions without any risks.

On his appointment to the post of the Veterinary Investigation Officer in this Province in the month of June 1932, the writer's first duty was to carry out vaccination with goat-adapted Rinderpest virus with which he was familiar during his tenure of office as Assistant Veterinary Research Officer at the Imperial Veterinary Research Institute, Mukteswar. Major E. S. Farbrother, Director of Veterinary Services, Province of Bombay, who was closely watching the incidence and spread of the disease in the Province, afforded him readily all facilities and guided him in his work. The first experiment on goat-virus vaccination was undertaken at a Gowshala in Pandharpur on the 17th September 1932. The result obtained was a great success and revealed that there was not so much risk in this vaccination as was originally anticipated. Encouraged by these results the writer was called upon to combat two other outbreaks of Rinderpest; one in Belgaum District and the other in Poona District. Both of them were successfully controlled within a short period by resorting to goat-virus vaccination. Being convinced of the efficacy of goat-virus vaccination in affording 'active' immunity to cattle without much risk and in controlling outbreaks of the disease within a short period, it was decided under instructions from the Director of Veterinary Services, Bombay, to subject cattle and buffaloes of different breeds and of different districts all over the province in "clean" and "affected" villages. Systematic experiments maintaining a record of animals vaccinated were, thereupon, carried out for a period of about three years, and a brief account of it is given in the following pages.

Goat-Virus Vaccine (Goat-Blood-Virus).—The strain of goat-virus was obtained from the Imperial Veterinary Research Institute, Mukteswar and was propagated by passage into local goats in the field. The reaction produced in the goat comprised of fever up to about 107°F., inappetence, staring coat, congested mucous membrane and dullness. The height of reaction usually occurred on the third or the fourth day, when the goat was bled from the jugular vein and the blood was immediately defibrinated. The virus bottle was then kept in cold water and the blood virus was used as a rule on the day on which the blood was collected. The temperature charts of vaccinated goats are attached (Figs. VII and VIII).

Vaccination Reaction in Cattle and Buffaloes.—All vaccinated animals underwent a very mild form of Rinderpest, the symptoms of which were almost imperceptible to laymen save in exceptionally small number of animals. The initial rise of temperature was usually observed from the third to the 5th day after the injection of the dose of virus. The course of the febrile period extended from 4 to 5 days. The temperature curve in all animals was not constant; in some it rose gradually and in others rather abruptly. Along with fever, there was diminished appetite, staring coat and dullness. Many of the animals showed only fever; a very few, however,

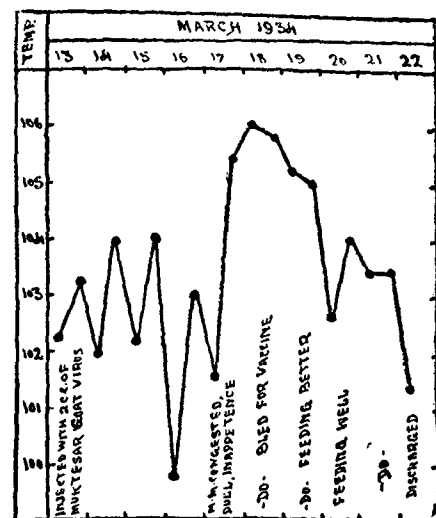


Fig. VII.
Vaccination reaction, goat 1 year
of age.

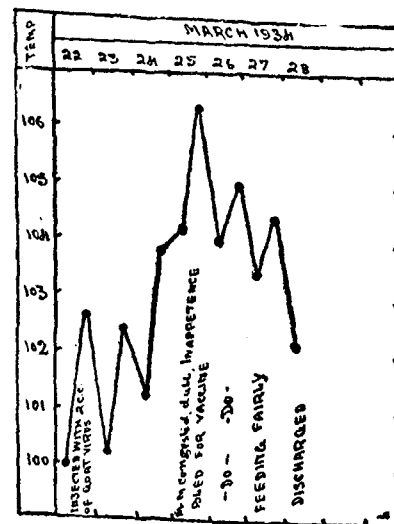


Fig. VIII
Vaccination reaction, goat 2 years
of age.

showed loss of appetite with the dung on the soft side. Exceptionally a few animals, especially debilitated ones and buffaloes, manifested diarrhoea but it was not foetid. Reduction in the milk yield was observed in almost all milch animals. Abortion in pregnant animals occurred only in exceptional cases. Mortality was only 0.5 per cent. In the affected villages, the percentage of mortality among the vaccinated animals was always rather high. Investigation, carefully conducted, revealed that every fatal case in such villages was an in-contact with affected animals and it pointed to pre-vaccination infection. The reaction produced in buffaloes was generally more severe when compared with that of cattle, but nevertheless, they stood the vaccination as successfully as cattle, thus showing that goat-virus vaccination could be carried out as safely and efficiently in them as in oxen. The temperature and other records of reaction off our animals are given in Figs. IX, X, XI and XII.

It is not possible to give in detail in this article the whole record of the experiments carried out on account of its bulkiness. The results obtained by systematic experimentation on 14,807 cattle and buffaloes are, however, stated in brief as follows :

1. The local goats were susceptible to the artificial infection of goat virus maintained at the Imperial Veterinary Research Institute, Mukteswar. They exhibited typical reaction to the virus and yielded potent virus during the period of the febrile reaction.

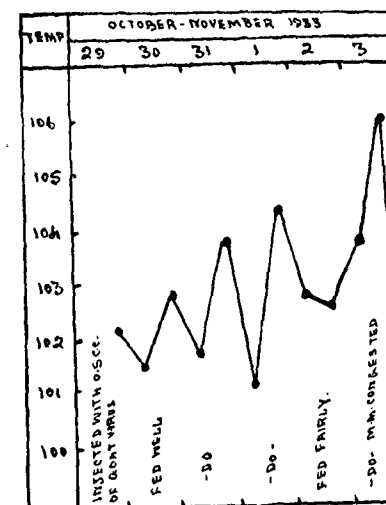


Fig. IX
Vaccination reaction, bull-calf,
Kanchan, Age: 6 months.

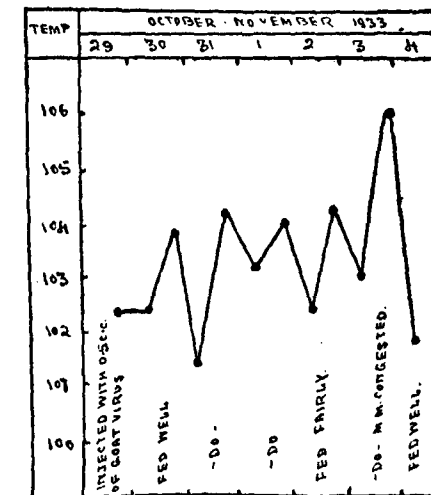


Fig. X
Vaccination reaction, cow-calf,
Bhajirathi, Age: 6 months.

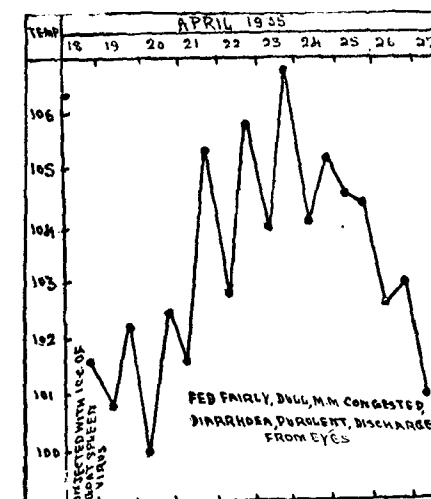


Fig. XI
Vaccination reaction, buffalo bull,
age: 6 years.

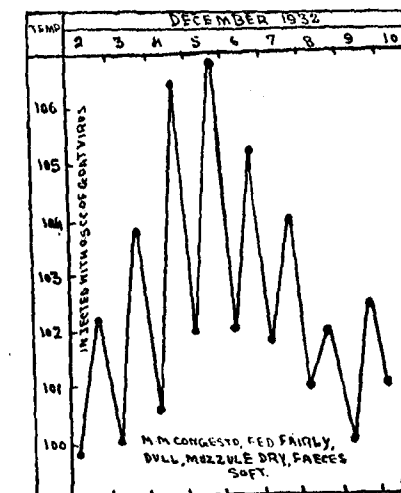


Fig. XII.
Vaccination reaction, buffalo-cow,
Gulab, age: 3½ years.

2. One half c. c. of goat-blood virus has been found to be an adequate dose for vaccination in cattle and buffaloes. One c.c. of spleen tissue emulsion prepared by triturating one gramme of the spleen tissue in 100 c. c. of normal saline or distilled water was also found to be an adequate dose.

3. Cattle and buffaloes vaccinated with the blood and spleen virus showed a reaction comprising generally of fever, inappetence and dullness which passed away within about 4 to 5 days from the initial rise of body temperature. Buffaloes reacted rather more severely than cattle. Reduction in milk yield was common in all milch animals during the period of reaction and amounted to about 46 per cent of the yield when a fresh potent virus was used. But this reduction was restored to normal within a few weeks gradually. There were, however, an appreciable number of animals in which the milk reduction was not more than 10 percent. of the milk yield. Abortion was extremely rare. A small number of vaccinated cattle and buffaloes, especially the latter, showed soft dung or diarrhoea for one to three days and recovered. Mortality occurred only in exceptional cases generally due to complication with other systemic disturbance rather than due to the goat-virus infection only. A small percentage of animals which were known to have not suffered from Rinderpest previously showed absolutely no rise of temperature, nor any other signs of reaction. Immunity test carried out on them showed they were immune to Rinderpest.

4. Cattle and buffaloes of all breeds of this Province have been found capable of being subjected to the vaccination operation successfully.

5. It has been found out by repeated experiments that the infection induced by the goat-virus vaccination is not transmissible from vaccinated animals to healthy unvaccinated ones. This important finding was recorded in the Annual Report of the Veterinary Investigation Officer, Bombay, during the year 1932 and since then all experiments on goat-virus vaccination undertaken in different districts were carried out without adopting segregation measures.

6. Goat-virus vaccination operations have been proved to act as an effective instrument in controlling rinderpest epizootics.

7. The duration of Rinderpest outbreak in an affected village after resorting to goat-virus vaccination has been found to be dependant upon the extent of the herd immunity established either by vaccination with goat-virus or acquired by an actual attack of the disease. Outbreaks subsided immediately where vaccinations were carried out wholesale. The average duration of Rinderpest outbreaks in villages where about 64 per cent. of cattle population were protected with goat-virus vaccination has been found to be about 2½ weeks as tabulated below.

Average duration of 28 outbreaks of Rinderpest in one affected area.

Average duration of outbreaks.			100
Cattle census.			
Before vaccination operations.	Duration of outbreaks.		6·1 weeks
	Statistics	Percentage attacks	12·8
		Percentage deaths	4·7
Percentage of susceptible animals vaccinated			64·2
After vaccination operations.	Duration of outbreaks.		2·4 weeks
	Statistics	Percentage attacks	2·7
		Percentage deaths	1·6

8. Vaccinated animals were sometimes observed to develop complications with Piroplasmiasis and Theilariosis but they were not serious to any extent. As a rule, recovery occurred in them spontaneously.

9. Vaccinated animals were tested with virulent ox-virus along with susceptible healthy controls at the termination of 1,2,3, and 5 years after vaccination. The results showed that the vaccinated animals in every experiment were found to be solidly immune. The duration of immunity conferred by goat blood-virus has, therefore, been proved to be more than five years.

On the strength of these valuable results Majr E.S. Farbrother, Director of Veterinary Services, Province of Bombay, stopped the use of 'Serum-alone' method of inoculation which was in vogue since 1904 and introduced the goat-virus vaccination method of prophylaxis for combating Rinderpest outbreaks since the year 1935, which is an epoch-making advance in the method of controlling Rinderpest in this province. The vaccinations are now not only carried out in affected villages but also in the clean villages surrounding it with a view to preventing the spread of the disease. They are also carried out in clean villages in the districts where the disease is enzootic especially during the winter season as during this season the reaction produced in vaccinated animals is very mild. The number of serum inoculations and goat-virus vaccinations carried out during the last 25 years are shown in Fig. XIII. It is now observed, that since the introduction of goat-virus vaccination, the mortality of cattle and buffaloes has been very much reduced as the average annual mortality is only about 6,360 for the last 4 years as against the annual average of 13,631 for the previous 21 years. It is hoped that this reduced annual mortality will be maintained in future years also as the number of animals actively immunised is steadily increasing every year. The field staff too feel a great relief on account of this change

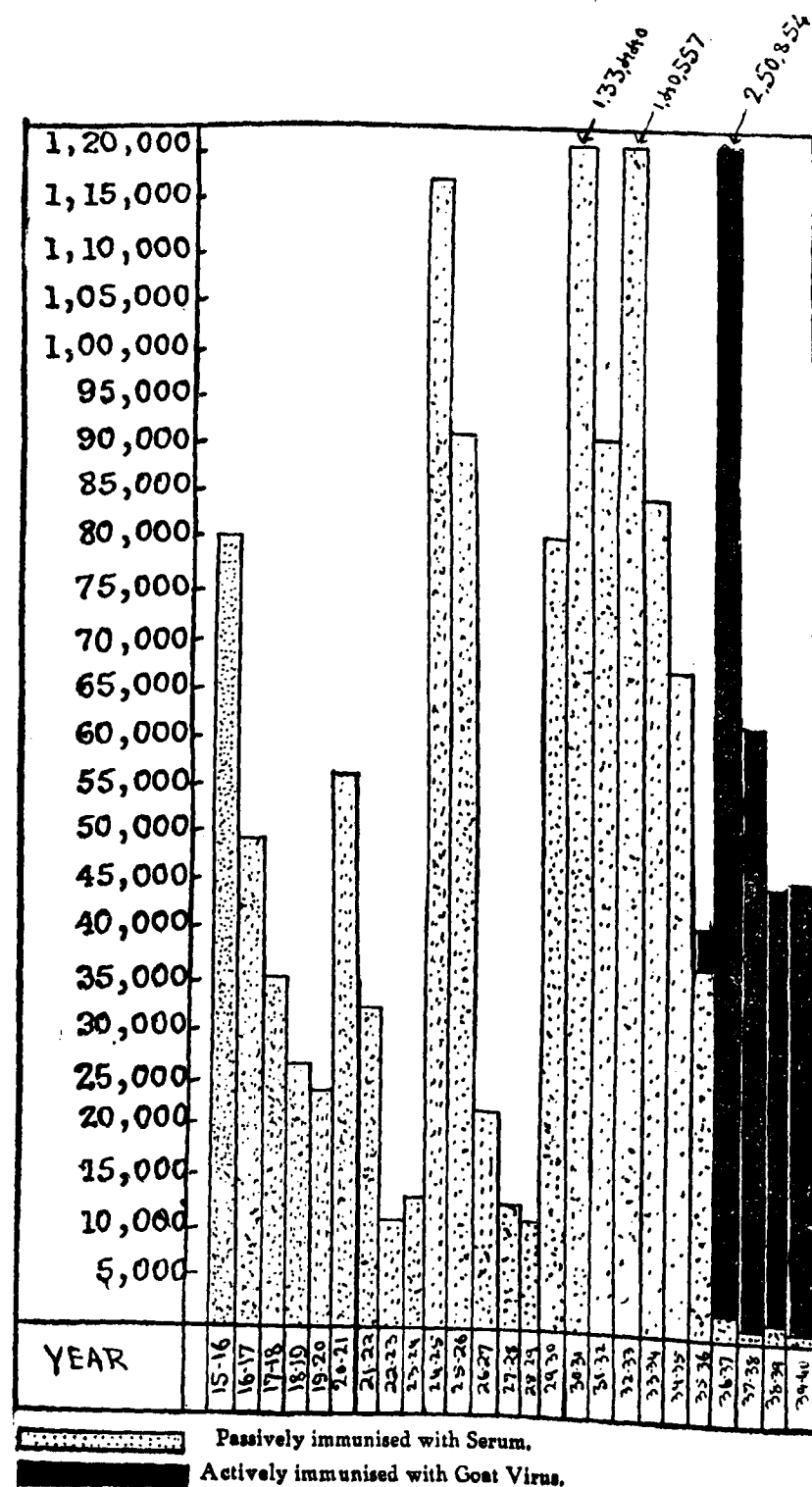


Fig. XIII—Preventive Inoculations against Rinderpest 1915-16 to 1939-40.

in the method of control of the disease as they have been spared the troublesome task of giving frequent visits to the scene of outbreak and of carrying out "serum-alone" inoculations every ninth day. Cattle owners, too, express great satisfaction over this method which has become during this short period, the most popular remedy ever introduced by the Veterinary Department.

What of the future? It has been proved to the hilt that goat-virus vaccination method of affording active immunity against Rinderpest in cattle and buffaloes is one which is quite safe, very efficient and is capable of being applied under rural conditions in India in general and in this province in particular. It behoves, therefore, that this method should not only be used for the control of outbreaks but also for general prophylaxis for the purpose of establishing Rinderpest-free zones, especially in the districts where it is intensively enzootic. If its use is restricted for controlling outbreak of the disease only, rinderpest will remain as an enzootic, inflicting heavy losses to cultivators all the time. The money-value of cattle which succumbed to rinderpest annually in this province previous to the introduction of this method was about Rs. 6, 81, 500. It is now reduced to about Rs. 3, 18, 000 after its introduction. Even this latter amount is too big a loss as it is entirely borne by the poor, ignorant and half-clad cultivators whose lot in these days of depression is unexpressly pitiable. If the economic conditions are to be improved, all their cattle, irrespective of whether they are in good or debilitated condition, should be made absolutely immune from this deadly disease. It is not fair to consider the debilitated and other non-descript cattle as 'scrub' animals and allow them to face the invasion of the disease without adequate protection. For one thing, on humanitarian consideration, they too require to be fortified against the disease; for another, these cattle which appear to our eyes as weaklings, scrub, degenerate and hide-bound creatures, are the valuable property of poor cultivators who have invested their hard-earned savings in acquiring and maintaining them in as fit a condition as their economic means permit and who, therefore, cannot afford to lose any one of them. It must also be recognised that the annual income of these cultivators is very, very low.

It is feared in some quarters that, by establishing Rinderpest-free zones, a race of cattle highly susceptible to Rinderpest may be evolved. This fear has no basis to stand upon and it appears to be only an imagination drawn from the analogy of what obtains in some rinderpest free western countries where cattle are extremely susceptible. It is very well known that the active immunity conferred on the dam is not transferable in any degree to its offspring and also that the immunity conferred artificially to cattle in calf-hood wears out much before they attain adolescence. These indicate respectively non-inheritance of Rinderpest immunity and non-

retention of the same in the body of immature animals. Again the buffaloes which exist in India along with cattle are also exposed to repeated rinderpest infection just as cattle, but still the resisting power of buffaloes to this disease is not equal to that of cattle. From this, it is evident, that the increased resisting power possessed by the Indian cattle and buffaloes is due essentially, to their breed specificity.

It is also quite appropriate to make the best use of the scientific progress made in respect of prophylaxis against Rinderpest for the immediate good of animal husbandry in this country without considering what will happen after some remote date. It is quite possible that, in the not distant future, research workers might evolve a better prophylactic method than the one in vogue at present, but then, it is unwise to remain idle without taking advantage of the existing available facilities.

Acknowledgement

The work on goat-virus vaccination experiments was carried out as a part of the duty of the writer whose budget is partly subsidised by the Imperial Council of Agricultural Research, New Delhi. The writer desires to express his deep indebtedness to Major E. S. Farbrother, R.C.V.S., I.V.S. Director of Veterinary Services, Province of Bombay, for his valuable guidance in the work. Thanks are due to various Veterinary Assistant Surgeons and Veterinary Inspectors for the valuable assistance rendered by them.

References:

- Annual Reports of Civil Veterinary Department, Bombay, for the year 1904-05 to 1939-40.
- Annual Reports of the Veterinary Investigation Officer, Bombay, 1932-33 to 1939-40.
- R. N. Naik (1938). Duration of Immunity following Goat-Virus Vaccination in cattle. *Ind. Jr. Vety. Sci. Anim. Husb.*, VIII, 103-112.

RINDERPEST IN TANJORE DISTRICT (MADRAS PRESIDENCY). *

BY

GEORGE EBENEZOR,

Veterinary Assistant Surgeon, Mannargudy.

Rinderpest has been rightly called the "pest of cattle". Its ravages have been severe in the district of Tanjore. The loss of livestock from this disease during the years from 1940 to 1945, can be evaluated at nearly ten lakhs of rupees. The control and eradication of this devastating disease has

* Article read at the Provincial Veterinary Conference held at Madras in September 46 and condensed by the Editor.

been a matter of great concern for the Veterinary Department. In spite of great handicaps it must be said to its credit that 1,23,296 animals were protected against this disease from 1940-41 to 1944-45, though this represents only 20% of the total livestock.

Tanjore District is known as the "Granary of South India" and, therefore, she cannot afford to lose cattle in such large numbers. The irretrievable loss of animals from this disease has ruined many ryots. This state of affairs must not be permitted to continue any longer. The disease has to be eradicated. The old view that the disease must be permitted to prevail somewhere, so that the animals may possess some natural immunity, has to be abandoned once and for all. The eradication of the disease should be our policy. With this object in view, a study of the general conditions of the livestock obtaining in the District may be found helpful.

The major part of the District is in the delta of the Cauvery. Rains are plenty during the monsoon. And therefore a good portion of the District is water-logged and damp. Here it is interesting to note that in the comparatively dry tracts of Pattukkottai and Arantanji Taluks of the District the ravages of disease have not been very pronounced.

The total bovine population of the district is about 13,00,000. In general the cattle are small and puny and grossly underfed. No specific data are available about their resistance to Rinderpest. The disease has been in existence all along, sometimes mild and sometimes severe.

In the maintenance of these cattle, a peculiar practice obtains in this district. As soon as the harvest is over, from about the middle of January, cattle belonging to different owners are gathered in small and big herds for purposes manuring the land. About the same time, the cattle of the district, which had gone to Tiruvannamalai hills for grazing also return to their owners, usually bringing in Rinderpest infection. The period before January is the season when the disease is almost non-existent in the area. The infection gets in from somewhere when cattle from different localities are gathered and herded together. In the beginning the people pay little attention to the outbreak of the disease but, when a number of animals die, the herd is disbanded and the animals healthy as well as infected are returned to their respective owners in the different villages. The disease thus gets disseminated and flares up in all vigour. This period extends from April to July.

It is thus seen that the disease shows its presence from January, gains severity by about June and July and almost disappears by November and December.

The Special Rinderpest Officer of this Presidency, in his report on the disease, remarks that "Rinderpest follows the course of its own way

irrespective of the season, yet in the majority of the districts the mortality is greater during the rainy season than in the other seasons of the year". This seems inapplicable to this District. It may be that the percentage of deaths to attacks may be more in the rainy season.

From the facts enumerated above it will be seen that, the 'breaking up' of infected herds and the movements of cattle thereafter are the main causes of dissemination of the disease in the District.

Suggestions for efficient control of the disease.

1. **Detection of the disease.**—For the successful control of the disease, it has to be detected at its very inception; only then it is easy to formulate ways and means to root out the disease. But the difficulties of detection are many in such a vast area and with people of prejudices. With constant vigil and a smaller jurisdiction for the Veterinary Assistant Surgeons, early detection may become possible.

In this connection, I wish to point out that the diagnostic symptoms of Rinderpest are generally not seen in the present day outbreaks. Some animals die in the pyrexial stage, some show only very mild symptoms while many others have only diarrhoea as the prominent symptom. The absence of characteristic symptoms may be a reason for the non-detection of the disease in its early stages but it should be incumbent on the village munsiff to send a report to the authorities the moment there are two or three deaths in a village, irrespective of the nature of the disease.

2. **Prophylaxis.**—The S. S. inoculation with Goat-Blood Virus has proved a success. Great care has, however to be taken to ensure that the virus used is potent. For this purpose, it is highly desirable to produce the virus locally and not be dependent upon either Madras or Coimbatore centre. This would minimise the delay in getting the virus as is experienced at present.

If a good storage is available at the District headquarters, it would be possible to stock sufficient quantity of serum from the central institute and to replenish it whenever it is necessary. For successful inoculation, the dose of serum as prescribed by this department answers very well (2 c.c. per 100 lbs. body weight for 'black' cattle). This dose has been adopted by me for the various breeds of cattle, like Mysore, Nellore, Hilly or the Suḡali breed of Rayachoti taluk in Cuddapah District, and also in all the cattle of Neḡapatam and Nannilam taluks of Tanjore District. There have been instances of high reactions in a few animals but with no bad results.

Lastly, it is necessary to control the movements of the skin and bones from the affected carcasses and also enforce the Cattle Disease Act for

compulsorily inoculating all the cattle of the locality. Last year, an intensive method was adopted for combating the disease and it has been eminently successful.

A Motorised Mobile Unit, consisting of 5 Veterinary Assistant Surgeons and 6 Stockmen-Compounders has been touring in this District, covering a distance of 1,800 miles, visiting nearly 90 villages, of which 30 were scenes of outbreaks. With the help of the local Touring Veterinary Assistant Surgeons also this Unit has protected already more than 10,000 animals. The primary object of the Unit has been, to rush up to infected places, and combat the disease effectively. The disease has subsided by now, and it has been in no small way due to the quick and effective attendance on outbreaks. The disease having subsided, the Unit is throwing out a cordon of safety by protecting the animals round about the infected areas. Such quick and effective attendance, when the disease breaks out in an area, will certainly control the disease and its spread.

I am very much thankful to Sri S. Ramaswamy Ayyar, G.M.V.C., District Veterinary Officer, Tanjore, for all the help and advice he has given me in preparing this article.

A NOTE ON GLYCOSURIA IN RABIES.

BY

D. KRISHNAMURTY,

Pathology Section, Madras Veterinary College.

In the systematic description of rabies in animals, especially canines and bovines, it is usually stated that the affected animals show glycosuria. Hutya and Marek (1938) while dealing with the symptoms of this disease in canines state that "the urine in the course of the disease contains upto 3 per cent dextrose (Nocard, Nicolas and Rabiaux found glycosuria in the thirty three of forty five and Pfeil in seven of fifteen cases examined) but albuminuria is rarely present or only in a slight degree 2.5 to 4.5 per 1000 Pfeil)". Similarly while describing this disease in cattle, the same authors remarked that "urine often contains dextrose (Nocard, Rabiaux and Redecha, found 9 per cent in a case shortly before death)." In November 1944, occasion arose for the examination of the urine of a rabid dog for pathological constituents. During the test neither albumin nor sugar were detected and consequently a short investigation was undertaken for ascertaining the frequency with which these occurred in rabid dog's urine. The details of the procedure adopted and the observations noted are described in this paper.

Procedure :—

According to the usual practice in the Madras Veterinary College Hospital, all animals suspected for rabies are kept under observation for ten days, during which period it is expected that these animals if they are suffering from rabies, will evince definite symptoms of the disease and finally succumb. When the animals die during the course of detention, the carcasses are sent to the Pathology Section (Madras Veterinary College) for examination of the brain smears for rabies. Suitable materials are also sent to the Pasteur Institute, Coonoor, for confirmation of the results.

Besides the brain material, samples of urine were collected wherever available directly from the bladder from such carcasses. The usual laboratory technique—William's modification of Van Gieson's stain and Mann's method—was adopted to detect the presence of negri bodies in the brain material and the urine samples were examined to detect the presence of sugar and albumin. The common biochemical tests for sugar (Benedict's, Fehling's and Nylander's) and for albumin (heat-coagulation, Heller's and Esbach's test) were conducted. Duplicate samples were examined and these results were confirmed by the Physiology Section of the Madras Veterinary College.

Although samples of urine were collected and examined from carcasses of animals clinically suspected for rabies, only the results of those cases confirmed for rabies on autopsy are included in this paper since they are unquestionable cases of the disease. The results of examination of 21 cases—16 canine and 5 bovine—are recorded and the details are given in the following table.

Serial No.	Kind of Animal	Number observed	Presence of Sugar	Presence of albumin
1	Dog	7	Nil	1 (one in traces).
2	Bitch	6	"	2 (one, in traces other 0.3%).
3	Pup	3	"	Nil
4	Cow	1	"	Nil
5	Heifer calf	2	"	Nil
6	Bull-calf	2	"	1 (0.25%).
Total		21	Nil	4

The above table shows that in all the cases no sugar could be detected and that albumin was present only in four of them. Since the investigation

includes carcasses of either sex and animals of different ages, neither of these two factors can be considered to affect the presence of glycosuria in rabid animals.

It may be argued that glycosuria is only noticed at the early stages of this disease and not at its final stage and as such, collection of urine from the carcasses of rabid animals need not reveal any sugar. But Nocard, Rabieaux and Redecha have recorded the presence of sugar even upto 9 per cent in a rabid cattle just before death, and so glycosuria is expected even at the last stage of this disease. Again the absence of sugar in these urine samples that were collected from rabid animals some time after death may be attributed to postmortem glycolysis. But according to Jetter and Mclean (1943) the urinary sugar destruction is about 50 percent in the first twelve hours after death, with an additional loss of 25 percent during the subsequent 12 hours. If this be so, glycosuria could be detected even 24 hours after death with the usual tests which will detect even traces of reducing sugar. Throughout this investigation samples of urine were collected and examined as soon as possible and in no case later than 18 hours after the death of the animal. The absence of glycosuria in these cases cannot be explained by any other way except that it is not exhibited as a symptom of these rabid cases.

The presence of albumin in 19 percent of the cases cannot be considered significant as albuminuria in these cases may have been due to factors other than rabies.

Conclusion :

An examination of samples of urine from 21 carcasses of animals that died of rabies was conducted for sugar and albumin. No glycosuria was detected in any of these cases and albumin was noted only in four of them (19 percent). It would thus appear that glycosuria and albuminuria are not frequent features, much less, symptoms of rabies.

I am much indebted to Sri M. Y. Mangrulkar, M.Sc., M.R.C.V.S., D.T.V.M., Lecturer in Pathology and Bacteriology under whose guidance this work was conducted and to the Lecturer in Physiology for having the duplicate urine samples examined.

References :

1. Hutyrá, F. and Marek, K. (1938) : Special Pathology and Therapeutics of the Domestic animals, Vol. I.
2. E. R. Stitt, P. W. Clough, and Clough, M. C. (1938) : Practical Bacteriology, Haematology and Animal Parasitology.
3. Mallory F. B. (1938) : Pathological Technique.
4. Jetter, W. W. and Mclean, R. (1943). Biochemical changes in the body fluids after death—*American Journal of Clinical Pathology*, Vol. 13, p. 178-185.
5. M. A. Rangaswami Ayyar (1940)—*Indian Veterinary Journal*. Vol. XVI. p. 232-238.
6. Gradwohl, R. B. H. (1943) *Clinical Laboratory Methods and Diagnosis* Vol. I.



**DR. PANGAL'S
VETERINARY INSTITUTE**

26, WALLAJAH ROAD,
MOUNT ROAD,
MADRAS.

A few of Dr. Pangal's specialities to all
Lovers of Horses, Cattle and Dogs.

1. "Race Horse Brand" Equitone. A valuable Blood Tonic and conditioner for Race Horses, Polo Ponies, Hunters, etc. Quite indispensable to keep the horses in hard work always fit.
Price per 2 lb. tin Rs. 5.
2. "Tendon Lotion" For Inflamed and Sprained Tendons, Ligaments and joints in Horses. Price per lb. bottle Rs. 2.
3. "Electric Mange Cure" An excellent remedy for all kinds of Mange and is a specific for Follicular Mange. Acts like magic.
Price per bottle Rs. 2.
4. "Scented Pulvex" Tick specific. A wonderful Tick destroyer.
Price per tin Re. 1-4.
5. "Canatone" Vitamin Mineral Food for Dogs.
Price 1½ lb. tin Re. 1-8.
6. "Cough Electuary" A Specific for Cough and Catarrh in Horses.
Price per lb. Rs. 8.
7. "Bovotone" Best Tonic Powder for cattle containing Minerals and Vitamins.
Price per 2 lb. tin Rs. 2.
8. "Mange Dressing" A specific for all kinds of Mange.
Price per big bottle Rs. 3. Small bottle Re. 1-8.
9. "Dr. Pangal's Resolvin" Indicated in absorbing—without firing—Splints, Ring bones, Spavins, Enlarged Joints, Sprained Tendons and Ligaments; and cures Sore Shins, Capped Elbows and Hocks.
Price per 4 oz. bottle Rs. 8.
10. "Dhum Dhum" A specific for Dhum, i. e., heavy breathing so common in horses. Acts like magic.
Price per 2 lb. bottle Rs. 6. 1 lb. bottle Rs. 3.
11. Anodyne Paste for Horses.—Indicated in treating swollen joints, inflamed tendons and ligaments (Work not disturbed).
Price per 3 lb. tin Rs. 4.

For Other Specialities, Please Apply For Literature.

THE
INDIAN VETERINARY JOURNAL

(The Journal of The All-India Veterinary Association)

Vol. XXIII

NOVEMBER, 1946

No. 3

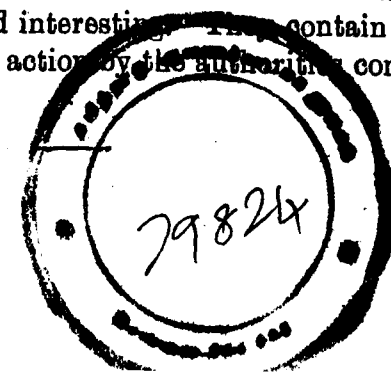
Editorial

OUR FOOD POSITION.

In a masterly survey of the Food Position in India, Dr. Rajendra Prasad, the Food Member of the Interim Government, detailed in the November session of the Central Legislative Assembly the steps that the Government had taken to avert the threatened famine in the country. He classified these steps under three heads *viz.*, importation of foodstuffs from abroad, intensive procurement from the local producers and stepping up production of foodstuffs in this country. The first two steps are obviously measures of a short-term nature intended to tide over the present acute crisis; the last measure, *viz.*, stepping up production is however of the greatest importance and it is necessarily a long-range policy. It is also the more sustaining. "India is an agricultural country and it is a matter of shame for us if we have to go to other countries for the one thing which is supposed to be our main concern and speciality" said Dr. Rajendra Prasad, and continued, "It would, therefore, be in the fitness of things that the Government should take all possible steps to increase the production in this country". Even before the war, our country was not self-sufficient with regard to our food requirements and it has been estimated that only 39 per cent of our population are adequately nourished, 41 per cent badly nourished and 20 per cent poorly

nourished. As Mr. Afzal Husain, Member of the Famine Inquiry Commission, has put down, India is suffering and, in fact, has been suffering, for some decades from a very acute famine of "protective" foods which has brought about physical decline and inefficiency, both in men and cattle, and if not attended to immediately may have serious consequences in an emergency. And, therefore, in the measures that are adopted by the Government for increasing the production of food-stuffs, special care must be taken not to concentrate solely on the cereals, the deficit of which is after all only 10 per cent but on "protective" foods like milk and milk products, eggs, meat and fish. Our production of fish and eggs must be increased by at least 300 per cent if the 400 millions of our people are to be given "a suitably balanced diet in minimum quantities". This aspect of our Food Problem has not been so far sufficiently realised by the Government in their drive for "Grow more Food" and it has been a vital defect in that campaign. Lamar-tine Yates and Warriner in their "Food and Farming in Post-war Europe" have rightly stressed this point as follows. "By shifting the emphasis for his production from grain to livestock products the peasant sets his feet on the beginning of a road which can ultimately lead to prosperity in a way that cereals never can". We, therefore, appeal with all the earnestness at our command, to all the Governments in the land—Provincial, State and Central—to start their Food Production drive with measures for the improvement of Animal Husbandry and all that it connotes. Better livestock will lead to increased production of foodstuffs, both in quantity and in quality, and the people will then be able to consume a more "balanced" diet than they are now doing. At present, although our livestock population is the largest in the world, still our milk production and consumption is the lowest in the world. It is so because our livestock has remained neglected for a long time past and the majority of them are only living skeletons, scarcely able to drag themselves along. The milk yield from them is extremely poor and their capacity for work is very much limited. This decline in livestock has resulted in the decline in human physique and, therefore, the first essential step in the campaign for

increasing the food production should be the development of the livestock. In this connection, it will be interesting to recapitulate what other countries have done to increase their food production. Apart from other subsidies to the farmers, Great Britain, for example, has paid during the year 1942-1943 a sum of nearly £90,000,000 as subsidy to producers of milk and, as a result of it, milk production for the year exceeded 1,100,000,000 gallons which is 50,000,000 gallons greater than the pre-war averages. The public consumed over 1,000,000,000 gallons of milk as liquid milk which is nearly 300,000,000 gallons above the pre-war average. Compare these figures with what the Government in India has done. We spent over Rs. 91 crores to import food from abroad and spent an extra 15.5 crores to distribute that food!!! Even if a portion of this Rs. 15.5 crores had been spent on subsidising the production of food within the country we need not have gone round "here and there begging for food". It is therefore imperative that the Government should bestow their thoughts to the serious lacunae in the economics of the country and proceed to plan for self sufficiency immediately. Animal Husbandry has been a neglected subject for a long time now and that has led to a steady deterioration of livestock; and this in turn has resulted in diminished food production and the downfall of the peasant and the people. This past neglect must be rectified immediately and prompt measures must be taken without any delay to improve our livestock by proper Feeding and Breeding as an essential preliminary to stepping up of our Food production. We have in the previous issues of this *Journal* elaborated on this subject and, therefore, we do not, propose to go over these once again. We would, however, draw the attention of the authorities to the proceedings of the Provincial Veterinary Conference held at Madras recently which are published elsewhere in this issue and which we are sure would be found interesting. They contain material for thought and immediate action by the authorities concerned.



5L
KZm2,1
N46-2;

RETIREMENT.

Khan Bahadur Abdul Hamid Khan, G.B.V.C., P.C., (Edin.)

Professor of Anatomy, Bombay Veterinary College.

Khan Bahadur Professor A. H. Khan, son of late Mr. Mahmed Latif Khan, Engineer in Kathiawar States, comes of a highly educated and respectable Muslim family of Poona. He graduated from the Bombay Veterinary College in December 1915 and, entering Government Veterinary Services in Central Provinces and Berar, worked in various capacities as Veterinary Assistant Surgeon, as Lecturer in Veterinary Science in Nagpur Agricultural College, etc. Returning to his native Province of Bombay which always had an attraction to him, he served for a short period in the Bombay City and Harbour Veterinary Department. He was then selected by the authorities for training in Anatomy at the Royal (Dick) Veterinary College, Edinburgh under Professor Dr. O. C. Bradley. After this training, he succeeded the late Professor Khan Sahib A. I. Shaikh as Professor of Anatomy at the Bombay Veterinary College in 1930.

He also paid a special visit to the Anatomy Department of the Madras Veterinary College which justly enjoys a great reputation in this field. He effected vast improvement in the Anatomy section and raised the teaching of Anatomy at the Bombay Veterinary College to a high standard.

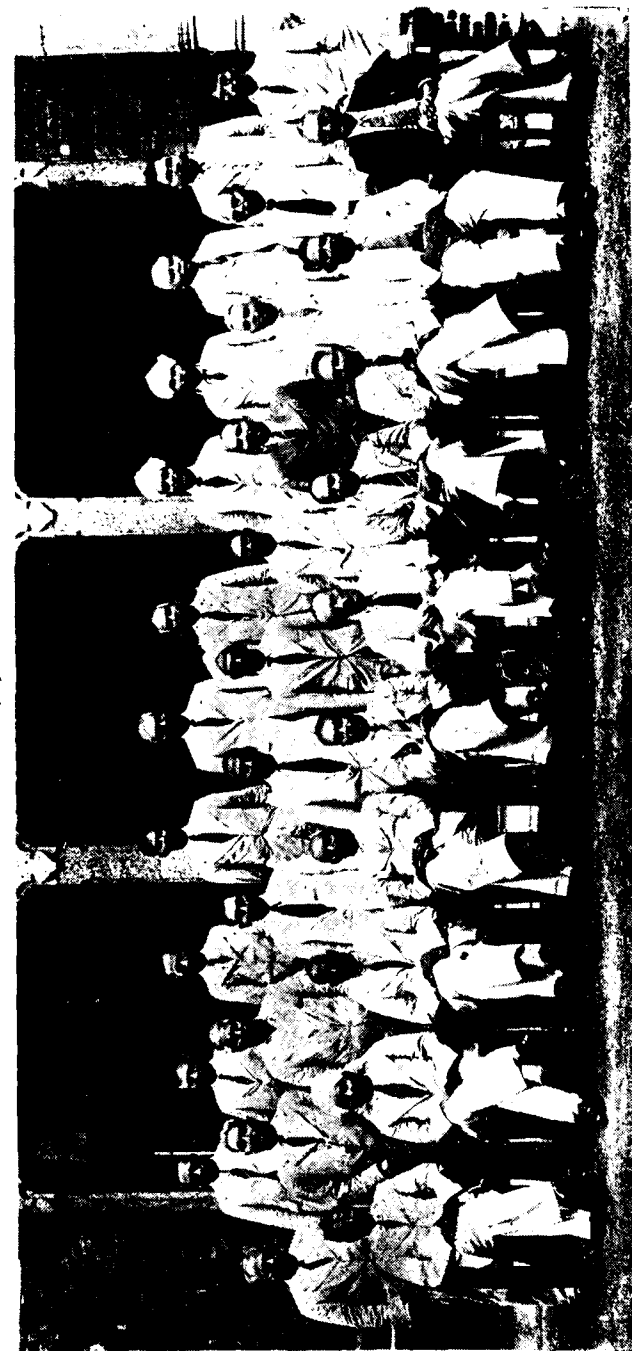
Very tactful and popular, he always maintained a high standard of discipline among the students. Honest and sincere in whatever he did "Khan Sahib", as he was familiarly called by his colleagues and friends, was made Khan Bahadur in the Birthday Honours of 1946, an honour which he richly deserved.

All his colleagues and friends wish him and his family long life, prosperity and happiness.

[We understand that Khan Bahadur A. H. Khan has been appointed as Professor of Anatomy in the newly started Osmania Animal Husbandry and Veterinary College affiliated to the Osmania University at H.E. the Nizam's Dominions, Hyderabad-Dn. *Ed. I.V.J.*]

CIVIL VETERINARY DEPARTMENT, MADRAS.

Conference of Departmental Officers, held in September, 1946.



Sitting Left to Right:—S. Ramaswami, S. Seshadri Ayyangar, K. V. Raghavachari, L. A. Sarma, K. S. Neir, T. J. Hurley, (Director) T. Murari, G. R. Viswanathan, M. Noor Ahmed Sahib, M. T. Krishnaswami Ayyangar.

Standing 1st Row L. to R.:—Y. Kameswara Row, T. L. Anantaraman, H. Naraheri Rao, S. Jacob, K. Ranganathan, A. S. Mahadeva Ayyar, P. Subbarayalu, M. C. Chellam, C. Madhavan Nambiar, K. P. Duraiswami, M. Ramakrishna Pillai.

Standing 2nd Row L. to R.:—R. N. Govindaswami, M. Lakshmana Raju, C. N. Subbaraman, I. D. Manthramurti, V. Venkataraman, S. Krishnamurti, V. Appu Rao, K. R. Lakshminarayana Iyer, K. Mallikarjuna Rao, B. Ramiah.



Rao Sahib Sri V. P. SUBRAMANIYA MUDALIAR, G. B. V. C.,
Retired Dy. Superintendent, Civil Veterinary Department, Madras.
Who died on 12th October, 1946.

Late Rao Sahib V. P. Subramaniya Mudaliyar, G. B. V. C.

It is with deep regret that we record here the sad demise of Rao Sahib V. P. Subramaniya Mudaliyar on 12-10-46 in his native village of Vellakal in Tinnevely District. The news, we feel sure, will be received with great surprise and sorrow by the entire profession in Madras and elsewhere. For, Rao Sahib Mudaliyar by living up to an age, scarcely reached by many—he was 89 years of age when he died—raised hopes in many of us who had seen him so hale and hearty recently, that he might cross the Rubicon and thus make this little profession to claim a Centenarian amongst its members! This was not to be. Rao Sahib Mudaliyar came in contact with several generations of Veterinary Surgeons and kept up a live interest in their welfare to the end of his days. Even so recently as September 1946, he had sent in his delegation fee for the Provincial Veterinary Conference at Madras and the President referred to Rao Sahib Mudaliyar in his address also. He may rightly be called the doyen of our profession in Madras. As an early worker, he set an example to professional posterity in honesty of purpose and high sense of duty. He was associated with pioneers like Mills, Holmes, Gunn, Dawson, Aitchison and Ware in shaping the Civil Veterinary Department, Madras. On his retirement Mr. F. Ware (now Sir Frank Ware) wrote in the Administration Report “The Department and the public generally have suffered a loss through the retirement of M. R. Ry. V. P. Subramaniya Mudaliyar, Avl.” Such was the regard and love in which he was held by the profession.

But his eminence chiefly lay in the Tamil world. In his preface to a biography of the late Rao Sahib, Mr. T. C. Sreenivasa Iyengar, B.A., B.L., M.L.C., writes, as follows:—

“Nothing can be more delightful to a lover of Tamil than to be associated, in however remote or humble way, with a work dealing with the life and literary labours of an erudite scholar and fine poet. Mr. Subramaniya Mudaliyar, the subject of this biography, is a unique personality. He represents the combined culture of the East and the West.”

That sums up the eminence of Mr. Mudaliyar in the Tamil world. He was really a cultured man in every sense of that term. There was refinement in his personality, in his dress, in his manners, in his speech and in his deeds. Twenty years ago, we had written in these pages, the biography of this literary giant amongst us. Space prevents us from covering the same ground. Our only wish is that all those who could understand Tamil, should read his several works and thus realise the greatness of this man. What has been said of Milton, may with appropriateness be applied to Mr. Mudaliyar.

"Three poets in three distant ages born
Greece, Italy and England did adorn
The first in loftiness of thought surpassed;
The next in majesty; in both the last
The force of nature could no further go;
To make a third, she joined the former two."

We offer our heart-felt condolences to the members of the bereaved family.

WANTED A Veterinary Officer Immediately.
Pay According to Qualifications and Experience.

Apply Direct to:

The Western India Stud Farm,
Pimpri,
P.O. CHINCHWAD, G.I.P.

Clinical Articles

A MYXOFIBROMA IN THE HEART OF A GOAT

BY

H. K. LALL, B. Sc., M. R. C. V. S.,
Government Livestock Farm, Hissar

The neoplasia of heart are very rare in domesticated animals. Gaiger and Davies [1938] state "Tumours of the heart muscle are comparatively rare; lipoma, fibromata, myxomata, rhabdomyomata, secondary carcinomata and sarcomata may occur". Runnels [1938] also observes that primary tumours of myocardium are rare and that fibromas and myxofibromas have been reported, but he mentions that the secondary tumours such as lymphocytoma in cattle are frequent and that 50 per cent of lymphocytomas reported by Feldman had cardiac involvement. Jackson [1936] came across only 5 tumours involving the heart out of a total of 390 tumours (excluding the one seen in poultry). Morris [1944] and Kenny [1944] in their collection of neoplasia of the domestic animals do not mention any tumour of the heart. Among the 305 tumours of the Trotter series [quoted from Feldman 1932], not one was seen in the heart. Feldman has however mentioned a small number of such tumours of the heart reported by the various writers; most of these were fibromas, myxomas, and rhabdomyomas.

Myxomas as pure neoplasia or in combination with other forms, such as fibromyxoma are the rare tumours of domesticated animals. Kenny, Jackson, Feldman *ibid* observed only two, five and six myxomas respectively from their collection of 214, 390, 550 tumours.

The tumours of the goat are again rarely brought to notice, because of the examination of relatively small number of these animals and their slaughter at an early age. Out of 21,887 goat carcasses examined in the year 1930 in U.S.A., only 2 cases of tumours or abscesses were observed. Out of Feldman's collection of 550, there was a single tumour from a goat which was a lymphoma. Jackson came across 46 tumours from numerous tissues examined from goats and none of these was a myxoma, the most common being acanthomas. The object of writing this note is merely to record a neoplasia of a rare occurrence.

Subject.—Jamnapari goat, 2 years' old, belonging to the flock of the Government Livestock Farm, Hissar.

History and symptoms.—It was tested for tuberculosis in view of the prevalence of the disease in stock and found to be negative. It was tested for brucellosis six months earlier as a matter of routine. For that purpose, the blood was taken from the jugular vein. It used to lag behind when the flock went for grazing and was very slow in movement. Eventually the inco-ordination of hind legs developed and it walked with

haunched croup. Paralysis followed some time later. The temperature did not reveal any indication of the disease. Respiration was hard and difficult and the animal looked anaemic. Palliative treatment of massage and stimulants was tried but had little effect. Pain evinced in the back region indicated some injury to the spine, but in the absence of any such history kidney trouble was suspected. Heart was not examined. The animal died after about a week at the farm hospital.



A Myxofibroma in the left ventricle. Also note various small tumours on the heart wall.

P. M. Lesions.—No sign of external injury was visible. All other organs except kidney and heart were normal. Kidney showed lesions of pyaemic nephritis. The left ventricle of the heart, when cut, showed a mass of tumour about the size of a ping pong ball along with smaller growths arising from the wall of the ventricle, occupying almost the whole of the ventricular cavity (See the photograph). The other parts of the heart, including the valves, were normal; no gross abnormality of the adjoining lymphatic glands was noticed. Dr. Minett, the Director, Imperial Veterinary Research Institute, to whom the material was sent, diagnosed it to be a Myxofibroma.

ACKNOWLEDGMENTS

I am indebted to Dr. F. C. Minett, Director, Imperial Veterinary Research Institute, for kindly getting the material diagnosed.

REFERENCES

- Feldman, W. H. (1932) Neoplasms of Domesticated animals. 66, 97, 71.
 Jackson, C. (1936). *Onderstepoort Jour. of Vety.* 1, 6, P. 429, 430, 434.
 Gajder, S. H., Davies G. O. (1938). *Vet. Path. and Bact.* 59.
 Runnels, R. D. (1938) *Animal Pathology*, 197.
 Morris, J. M. (1944) *Emergency Slaughter and Malignant Neoplasms (Bovine)*, *Vet. Rec.* 15 Vol. 56 P. 144.
 Kenny, S. E. (1944). *Some Observations on Bovine Neoplasms.* *Vety. Rec.* 9 Vol. 56, P. 69-71.

RETENTION OF PLACENTA—A SAFE TECHNIQUE FOR ITS TREATMENT

BY

Capt. S. B. V. RAO, I.A.V.C.

V. O. Military Farm, Secunderabad Dn.

Retention of Placenta with its grave sequelae in Dairy Animals is a major problem on Military Farms. It has been dealt at length by Capt. Hayword, E.V.O., Lahore, in the *Veterinary Record* Vol. 57 dated 17th Nov. 45 and he has come to the conclusion that allowing the calves to suckle reduced the incidence of the complaint.

While fully agreeing about the gravity of these cases it had to be observed, that the conclusions of Capt. Hayword could not be substantiated to any appreciable extent as gathered from the following data obtained from the Secunderabad Military Farm.

		Calvings	Retention	%	Metritis	%	Deaths & Sale as destruc-	Sterile
							tions	
1st April 45	} Buff- to aloes Cows	1433	206	14.5	45	33	9	36
31st March 45		94	53	56	8	14	—	34

In spite of the fact that the calves were allowed to suckle their dams for 4 days from birth as a routine measure, the incidence was as high as 14.5 percent in Buffaloes and 50 percent in cows, in 1945/46, as against the figures of Hayword which show 17.1 percent for 944 animals in "weaned" cases and 0 to 9 percent in "suckling" cases. Neither condition nor age of the animal had any influence; similarly oil drenches before calving, and cleansing mixtures after, had little effect. A heavy percentage of "Retention" has become an accepted part of the normal calving-line, throwing a great strain on the Veterinary staff in manually removing the placentas of several cases daily and in giving the after-treatment, like douching of over a dozen animals every day. Not infrequently, a percentage of these cases developed endometritis, in spite of great care and administration of sulphanilamides. Unprofessional handling naturally brings in a gamut of evils in its train. Animals go down in condition discharging "Whites" in quantities in milking-lines during defecation, develop complete prolapse and chronic purulent endometritis ending in death or sterility—facts which are often ignored by Dairies where Livestock management is in the hands of non-professional "Experienced" men.

A discussion some time back with Lt.-Col. J. Clabby, A.D.V.S., Farms, G.H.Q., New Delhi, about the practical difficulties of the adoption of the old line of treatment on a large scale, resulted in a trial and adoption of a line of treatment involving no manual interference or douching and reduced sepsis to a minimum. The details of this are as follows :—

Apparatus :—Higgins type syringe with Nielsons 4 m.m. Single flow Catheter (tube uterine) attached, and 8 ozs. gallipot.

Drugs :—(I) Acriflavine in glycerine 1/2000. 6 ounces in the dose.

(II) Luğol's Iodine 1/500. Stock solution is prepared by dissolving one ounce Pot. Iodide and one ounce Iodum in one pint water. One ounce of this in one pint of water is the dose.

Course :—First day :—Intra-uterine insufflation of No. (I).

Second day :—Removal of that portion of the membrane as could be done with the hands, without inserting into the cervix.

Fourth day :—Repeat No. (I).

Seventh & eighth day :—Repeat No. (I).

Tenth day :—As a final treatment before discharging the animal, inject Luğol's Iodine as in (II).

Method.—The syringe and catheter are sterilized before use. The external genitals and the vagina are washed with a solution of lysol. The drug to be insufflated is held in a gallipot at the level of the anus by a person who also operates the syringe, which is stood in a gallipot. The surgeon having disinfected his right hand, holds the tip of catheter, passes his hand into the vagina, detects the cervix with his fingers and then passes on the catheter for about one foot between the wall of the uterus and the placental membranes. With the downward stroke of the syringe, the liquid is gently pumped in. (This works better and quicker than gravitation, particularly as some animals strain). An oily dressing of Iodoform is thereafter applied to the external genitals to repel flies. The animals are normal usually 12 days after calving, as the spontaneous discharge of liquified placenta ceases by then; sometimes it may take a fortnight, but the yield is never affected by this treatment.

Summary of Results.—Over 60 animals were subjected to this treatment with cent-percent success. It commends itself for its simplicity of technique, absence of untoward sequelae, entails no loss of milk yield, and costs very little—it is about one rupee per animal. During trial twelve

cases under the "new" treatment (Group I) were compared with similar number as per "old" method as a check, after removing placenta manually on the third day (Group II). Group I showed no constitutional disturbance of any kind and there was free flow of milk. In Group II one case had a complete prolapse of the uterus on the sixth day after calving, then recovered, but with complete loss of yield for the rest of the lactation. Another case developed metritis, recovered after treatment, but the yield dropped very low. Four cases showed pyrexia from 4th to 10th day and recovered after treatment, coming into full flow only after three weeks; the rest 50 per cent (six animals) had uneventful recovery, but sulphanilamide and other drugs like Iodoform and lysol were freely used. Figures of Hayword show that on one Farm out of 132 calvings, 33 showed retention; and out of these 11 animals actually died of metritis, giving a figure of 8.3 per cent of calvings becoming a total loss when treated by the old method. These figures also offer a good basis for comparison.

In concluding it may be stated that "retention" occurs even in the semi-wild Amritmahal herds on Mysore Cattle Breeding Stations, where these animals are now bred under intensive conditions. The breeding programme at times is at a stand still, due to "retention" cases leading to endometritis and sterility. It may be recalled that the same animals when on free range with plenty of good pasture of Hariyali or Doob calve seasonally with insignificant cases of Retained Placenta. This makes one think in terms of deficiency of some vitamin factors like A & D, whose effect on the gravid uterus is conceded to have far reaching effects on the health of the dam and the viability of the off-spring.

Unless this major problem is approached in a scientific way and given its due place in farm economy, it would be little wonder if the best portion of the breeding stock finds its way to the butcher year by year—a national loss which India could little afford. Biologicals like Stilboestrol for retention, should also be fully exploited and faithful findings recorded on experimental Farms.

EQUINE AND BOVINE SURRA—ITS INCIDENCE IN BARODA STATE DURING THE YEARS 1944 and 1945.

BY

H. V. KULKARNI, G.B.V.C., P.G.,

Veterinary Investigation Officer, Baroda State.

Incidence of Surra.—

Virulent types of many outbreaks of Surra in Equines and Bovines have been recorded in Baroda State during the years 1944 and 1945 and they

caused enormous losses to the stock-owners. In the order of intensity of outbreaks during these years, the following are the localities,—1. Navsarai District (2) Mehsana District and (3) Baroda District.

EQUINE SURRA

Symptoms.—The first indication of infection is a rise in temperature associated with the appearance of Trypanosomes in the peripheral blood. The fever is intermittent and the Trypanosomes disappear from the peripheral blood when the temperature goes down. In the initial stages nothing more is noted, but, as the bouts of fever increase and as the disease advances, petechia on the mucus membrane, particularly on the conjunctiva, and oedematous swellings of varying severity in the extremities and dependent parts have been observed. The appetite remains un-impaired during the afebrile stage and it diminishes only slightly when the fever is on. The animal becomes gradually emaciated, develops paraplegia and invariably dies within a period of about 2 to 3 months, if left untreated.

Microscopical Examination.—1650 specimens of blood smears received from the Veterinary Assistant Surgeons and collected by the Veterinary Investigation Officer have been examined with 893 positive and 757 negative for Surra. Interesting specimens of blood smears and different kinds of biting flies were forwarded to the I.V.R.I., for detailed study from a morphological point of view and for identification respectively. The report received from I.V.R.I., is as follows. "The Trypanosomes found in equine blood smears were morphologically indistinguishable from *T. evansi*. Biometrically they appeared to be of bovine origin. Specimens of flies have been identified as belonging to genus *Tabanus*."

Mode of transmission and source of infection.—Cattle, buffaloes, or camels and biting flies are believed to be necessary factors to initiate outbreaks of Surra in horses. Bovines and camels act as foci of infection, the former being less dangerous than the latter. It is due to these animals that the disease is carried over from one Surra season to another. Indigenous cattle and buffaloes act, therefore, as reservoirs of the Trypanosomes. Further, these animals harbour the Trypanosomes in a latent state without exhibiting any symptoms of sickness. Biting flies are capable of carrying Surra infection from animal to animal and the mode of transmission is said to be only mechanical. Climatic conditions such as heavy monsoon rains with inundation of land favours the multiplication of biting flies especially of the genus *Tabanus*.

Treatment—Curative.—During the year 1944, specific drugs like Nağanol, Antrypol and Moranyl were not available in the market and therefore we had to depend upon arsenical compounds, such as N.A.B., and Neosalvarsan, in treating cases of Equine Surra. Antrypol was procured

in small quantities with great difficulties later on. Encouraging, but varying and inconstant, results have been achieved with arsenical preparations in early stages of the disease while with Antrypol the results achieved so far have been uniform and very successful particularly when the cases are in early stages. The efficacy of drugs like N.A.B., Neosalvarsan and Antrypol was tested and the conclusions arrived at are as under.

N. A. B., can effect a cure in very early stages of the disease but it does not succeed in all cases and more so in advanced stages of the disease.

Neosalvarsan (Bayer) has been also found equally good in early stage of the disease while the drug Antrypol is undoubtedly superior to arsenical compounds and as efficacious as 'Nağanol' in effecting a cure in early stages of the disease. In very advanced cases when the parasites gain entrance into the central nervous system, the drug has failed to act, probably because it is not able to reach the parasites.

During the year 1945 outbreaks of Equine Surra were successfully controlled by the use of the specific drug Antrypol as a prophylactic and curative measure. This drug as recommended by the I. V. R. I., has been given an extensive trial and has been found to be very effective in curing cases of Equine Surra especially when they are in the initial stages, (Table IV). Deaths among 'treated' cases were mainly due to negligence on the part of the owners of the animals particularly small ponies, in regard to feeding, nursing and medication.

The drug is administered in 10 percent aqueous solution intravenously at the rate of 5 grams per 1000 lbs. body weight. Two injections are necessary at an interval of 4 to 6 weeks as the drug is said to be in circulation for that period.

Treatment Prophylactic.—In the year 1944 prophylactic measures could not be undertaken owing to the non-availability of drugs like Antrypol. However all possible steps were taken for the prevention and control of Surra such as isolation of the 'affected' and 'suspected' from the healthy ones, burial of carcasses and disinfection of infected places etc. In 1945, the drug Antrypol was available and therefore, to ascertain its efficacy as a prophylactic agent, all Government animals, as well as valuable animals of the public were protected by injecting them twice at an interval of 4 to 6 weeks in the rainy season. The prophylactic dose given was the same as for the curative one. The results recorded are very encouraging, (Table IV). Relapses have been observed but they are due to reinfection of the blood by parasites through the agencies of flies. It has been noted that the animals treated with one injection have been resistant to re-infection for about a month and half.

Bovine Surra

Many natural outbreaks of Bovine Surra (Table II) have been recorded in Navasari, Mehsana and Baroda Districts, arranged in the order of intensity, during monsoon season causing heavy losses to the stock-owners. It is now known that *T. evansi* remains latent in the blood of considerable percentage of indigenous cattle and buffaloes and they induce symptoms of Surra only when the animals are subjected to some adverse conditions such as heavy rainfall and lowered vitality. After the heavy rains, the resistance of animals is lowered on account of the hard work of the ploughing season.

Transmitting agents or Vectors.—Mode of transmission of *T. evansi* from animal to animal is known to be only mechanical through the agency of various biting flies especially of the genus *Tabanus*.

Symptoms of acute Trypanosomiasis infection.—Only the acute form of Bovine Surra has been observed and it is this form which is fatal if the affected animals are not treated in time. The symptoms exhibited are as follows. Animal very much excited, circling round and round and dropping down after a few minutes, kicking with its hind legs vigorously and pressing the head against the floor and wall forcibly, shivering of the body, muscular tremors, perspiration, temporary loss of vision, irregular breathing, salivation, and death in a comatose condition within 2 or 4 hours from the onset of the disease. Severity of the symptoms depends upon the severity of the infection—the heavier the infection, the more alarming are the symptoms. Blood examination shows a heavy infection of trypanosomes even without any rise in temperature. 686 specimens of blood smears of affected and incontacts were examined and out of them 220 have been found to be positive for Surra.

Treatment.—Affected cases were treated with Tartar Emetic very successfully (Table V). This drug has got wonderful property of effecting a magic cure but its prophylactic quality is practically nil. 15 to 20 grains of Tartar Emetic in 20 to 30 c.c. of aqua distillata given intravenously at body temperature gives relief in 1 to 3 hours. For the effective cure maximum doses in greater concentration are required. Of course, one must use his discretion in adjusting doses according to the severity of infection. To prevent shock, physiological saline solution for preparing the solution of Tartar Emetic has been found to be very safe. Whenever symptoms of shock and muscular tremors are noticed, dashing of cold water on the head has been found to be sufficient for the recovery of the animal.

TABLE I

Statement showing incidence of Equine Surra in different Districts of Baroda State in the years 1944 and 1945.

Equine Surra				
Names of Districts	Year	No. of outbreaks	Attacks	Deaths
Navasari	1944	54	242	120
	1945	34	236	126
Mehsana	1944	44	174	37
	1945	15	274	202
Baroda	1944	14	33	17
	1945	12	90	34
Total	1944	112	449	174
	1945	61	600	282

TABLE II

Statement showing incidence of Bovine Surra in different Districts of Baroda State in 1944 and 1945.

Bovine Surra				
Names of Districts	Year	No. of outbreaks	Attacks	Deaths
Navasari	1944	39	342	265
	1945	14	59	35
Mehsana	1944	37	356	170
	1945	2	14	14
Baroda	1944	4	36	20
	1945	6	40	39
Total	1944	80	734	455
	1945	22	173	88

TABLE III

Statement showing the results of Treatments with different drugs in Equine Surra in 1944.

No. of horses Treated with N. A. B.			No. of horses Treated with Neosalvarsan			No. of horses Treated with Antrypol		
No. of horses Treated	cured	died	No. of horses Treated	cured	died	No. of horses Treated	cured	died
202	113	89	10	6	4	8	7	1
P. C. Cure 55.9%			P. C. Cure 60%			P. C. Cure 86.3%		

TABLE IV

Statement showing the results of Treatment with Antrypol in Equine Surra as a curative and prophylactic measure in 1945.

Curative Treatment with Antrypol			Prophylactic Treatment with Antrypol		
No. of horses Treated	No. of horses cured	No. of horses died	No. of horses Treated	No. of horses cured	No. of horses died
165	132	33	61	60	1
P. C. Cure 80%			P. C. Cure 99.8%		

TABLE V

Statement showing the results of Treatment with Tartar Emetic in Bovine Surra as a curative agent in 1944 and 1945.

Year	Curative Treatment with Tartar Emetic in Bovine Surra		
	No. of bovines Treated	No. of bovines cured	No. of bovines died
1944	80	55	25
1945	50	38	12
71%			29%

Association News

THE ALL-INDIA VETERINARY ASSOCIATION, MADRAS BRANCH.

Proceedings of the Provincial Veterinary Conference held under the auspices of the A.I.V.A., Madras Branch, at the Madras Veterinary College, on the 28th, 29th and 30th September 1946.

First Day 28th Sept. 1946.

The Conference commenced at 10-30 A.M., on Saturday the 28th September 1946 in the Central Hall (Upstairs) of the Madras Veterinary College which had been tastefully decorated. The following delegates were present:—

MEMBERS PRESENT:

- Kailasam Ayyar, K. Rao Sahib, President
- Swaminathan, R. Chairman, Reception Committee
- Sri T. L. Anantaraman
- " V. S. Alwar
- " T. S. Alagappa Pillay
- Mr. M. Abdul Khader
- Sri V. Anjaneyulu
- " R. A. Balaprakasam
- " G. B. Balagurunathan
- " G. Balesubramanyam
- " C. Baharadwajan
- " G. Brahmanandam
- " K. Chandra Menon
- " K. P. Chandrasekharan Nair
- " K. P. Doraiswamy
- Mr. J. D. David
- " G. Ebenezer
- Sri M. S. Ganapathi
- " K. Gopalakrishnamurti
- " K. Govinda Sastry
- " R. N. Govindaswamy
- " K. N. Govinden Nair
- " V. Gurumurti
- " B. Hanumantha Rao
- Mr. C. I. John
- " S. Jacob
- Sri V. Janakiramier
- " P. P. Karumbiah
- " M. V. Krishna Rao
- " Y. Kameswara Rao
- " G. S. Kalyanasundaram
- Sri S. Krishnamurti
- " D. Krishnamurti
- " S. Krishnaswamy
- " A. Krishnaswamy
- " K. S. Krishnappa
- " O. Lakshmana Rao
- " K. Lakshminarayanan
- " K. Mallikarjuna Rao
- " A. S. Mahadeva Iyer,
- " M. Y. Mangrulkar
- " A. R. Madhusudan
- " D. Mariappa,
- Mr. R. D. Michael
- Sri H. Narahari Rao
- " K. T. K. Nambiyar
- " E. R. Nagarajan
- " K. S. Nair
- " T. Narayanan
- " P. S. Natarajan
- " B. Narayana Rao
- " P. A. Parthasarathy Naidu.
- " S. Padmanabha Rao
- Mr. C. T. Peter
- Sri K. V. Parthasarathy
- " G. Pandurangam
- " C. V. Padmanabhan
- " M. Ramakrishna Pillai
- " K. V. Raghavachari
- " R. Rajamannar
- " T. Ramabrahmiiah
- " S. Ramaswami
- " K. Rangnanathan
- " G. Ramenujachari

- | | |
|--------------------------------|--|
| 65. „ Y. Ramanujam | 98. Sri A. V. Veerareghavan |
| 66. „ A. Ramchandran | 99. „ R. Veeramony Iyer |
| 67. „ P. Rama Rao | 100. „ S. Vancheswaran |
| 68. „ M. Ranga Rao | 101. „ R. Venkateraman |
| 69. „ V. Royappa-Reddi | 102. „ V. Venkataraman |
| 70. „ M. V. Ramakrishnan | 103. „ K. Vanchinathan |
| 71. „ R. Ramakrishnan | 104. „ C. B. Viswanathan |
| 72. „ H. R. Rangaswamy | 105. Mr. D. A. Victor |
| 73. Mr. M. S. Rajendran | 106. „ J. C. Victor |
| 74. Sri B. Ramiah | 107. Sri Velayuthan Nair, C. K. |
| 75. „ G. Somasundara Rao | 108. „ Rao Sahib T. Vinayaka
Mudaliyar |
| 76. „ T. Subramanyan | 109. Mr. F. D. Wilson |
| 77. „ Srinivasa Rao Panjal | 110. Sri C. Madhavan Nambiyar
(present only for G. B. Meeting). |
| 78. „ M. V. Sankaranarayanan | |
| 79. „ S. Seshadhri Iyengar | |
| 80. „ P. Subbarayulu | |
| 81. „ M. R. Subramanya Sastry | |
| 82. „ P. Srinivasan | |
| 83. „ T. Sivaraman | |
| 84. „ R. Srinivasan, | |
| 85. „ B. Sambamurti | |
| 86. „ C. K. Subbu Singh | |
| 87. „ Lt. P. Subramanyam | |
| 88. „ R. B. Sarma | |
| 89. „ K. Trivikrama Rao | |
| 90. „ C. T. V. Tilak | |
| 91. „ P. M. Thillanayagam | |
| 92. „ E. N. Thulasiram Singh | |
| 93. „ M. Umepathi Rao | |
| 94. „ G. R. Viswanathan | |
| 95. „ G. Venkatratnam | |
| 96. „ S. Vaithanatha Mudaliyar | |
| 97. „ D. Veerareghavan | |

Visitors

1. Mr. T. J. Hurley,
2. Rao Sahib P. P. Aippuru
3. Dr. M. K. K. Menon
4. „ K. Gopalakrishnaier
5. Sri N. Gopala Menon
6. Mrs. H. Lobo
7. Sri T. S. Rajagopalan
8. „ M. C. Chellam
9. „ K. Purushothuman
10. „ K. Ratnavelu
11. „ N. Balasubramanian
12. „ P. Raghavan Nair
13. Ministerial staff of the Madras
Veterinary College
14. Students of the Madras Veterinary
College

The proceedings began with a prayer sung by one of the students of the Madras Veterinary College.

Rao Bahadur Sri R. Swaminathan, Chairman of the R. Committee in welcoming the gathering made the following speech :—

THE HON'BLE MR. KUMARASWAMY RAJA, LADIES AND GENTLEMEN,

On behalf of the Reception Committee of this Provincial Veterinary Conference, I extend to you all who have assembled here a cordial and hearty welcome. It is very pleasing to find that so many of you have found it possible to respond to our invitation. To those who have come from mofussil stations, I have a special word of welcome. In these days of rationing and of difficulties in arranging for lodging and boarding, the Reception Committee had no easy task of making your stay here convenient and I do request of you to make light of the small inconveniences which you may experience during your stay here.

We are all particularly glad that the Hon'ble the Minister for Agriculture and Animal Husbandry has found it possible in the midst of his multifarious duties, to be present here to open this Conference. Ordinarily, this Conference should have taken place in the month of April, but as the popular Ministry was then in the course of formation, we thought it would be better to postpone this Conference to this date as we would then have the opportunity and benefit of meeting under the patronage of a popular elected Minister. It is good we did so, for we now see not only an elected popular Ministry well in the saddle, but also we see a National Government, provisional though it is, at the centre. This is the first Veterinary Conference of its kind which is honoured by the popular Minister in charge of Animal Husbandry Department and therefore this conference is a unique one. All these, we are sure, augur well for the future of our Veterinary Profession.

On an occasion like this, our thoughts constantly linger on the most outstanding question of the day viz. the Food problem and a question which naturally arises in this connection is whether the Veterinary Profession can do anything to solve this problem or at least mitigate its severity. What is the relation of the Veterinary Profession to the Food problem and the General Body politic? This question has to be answered clearly and unequivocally, as I find, much to my deep regret and sorrow, that even in circles, which ought to know better, there is a good bit of misconception about the duties and functions of a Veterinary Surgeon. I am, however, quite clear in my mind and I am sure that, after hearing me, you will all become convinced that the Veterinary profession can do a great deal in solving this Food problem. I will go further and say, without any fear of contradiction, that there would not have been this Food crisis if only the Veterinary Profession had been allowed to develop, organise and function in the way in which it ought to. In putting forward this claim, I am not speaking any language of exaggeration. I am speaking with a full sense of responsibility after having studied the conditions of the country and practised my Profession for over 32 years. I am quite positive that if only the Government had realised the immense amount of wealth that lies stored in the Livestock of this Presidency, and if only it had realised the potentialities of the Veterinary profession as the custodian of that immense amount of wealth and had done what it should have done by the Veterinary Profession—if only the Government had done these—then we would not be witnessing the extremely distressing spectacle of our administrators running or flying frantically to other countries asking for the supply of cereals, pulses and milk powder. The present crisis is only a culmination of the past neglect, although it has been accentuated by totally unexpected droughts and cyclones.

What exactly are the duties and functions of a Veterinary Surgeon? Ordinarily a Veterinary Surgeon is defined as one engaged in the treatment

of sick and ailing animals. It is the only one aspect of his work that attracts the eye of the public prominently and, although it is a highly noble humanitarian work without any equal, still, it is not the most important part of the duties of a Veterinary Surgeon. The more important portions of his work are the care and management of the Livestock of the Farm with special reference to their feeding and breeding, maintaining them in a state of health and well-being, ensuring the supply of good wholesome milk, meat and eggs for human consumption, controlling the diseases that are communicable from animals to man and ensuring the production of good wool and hides. He is the custodian of the cow which is rightly called the "Mother of Prosperity". He is the Doctor of the Farm and guarantor of the people's food supply. In a predominantly agricultural country like ours, where the majority of the agriculturists are only small holders, it is impossible to think of any agricultural operation without Livestock. To provide the land with the best of manures viz. the Farm-yard manure, to plough the land, to cart the grain, to furnish the much needed transport and above all to supply the ideal 'protective' food for human-beings viz. Milk—for all these cattle are absolutely essential. Not only are they essential but also they must be in a thriving condition if they were to fulfil the abovementioned functions. As the Tamil proverb goes "The prosperity of the cattle connotes the prosperity of the ryot and the prosperity of the ryot connotes the prosperity of the King". Who is the person best fitted to look after the livestock and the Mother of Prosperity except a Veterinary Surgeon? Who is the person except a Veterinarian who can ensure the production of good milk, meat and eggs for human consumption? Who is the person again who can by his education and equipment advise the farmer on the problems affecting his Livestock, except a Veterinary Surgeon? Such are the potentialities of a well organised Veterinary Service and this is the answer to the question of what exactly is the relation of the Veterinary profession to the Food production and the General public. A strong well developed, efficient Veterinary Service is therefore a *sine qua non* for a well organised State.

In ancient India, according to Kautilya's Artha Sastra, the State had a separate Department to look after the Livestock and a Superintendent in charge of the pasture lands. The maintenance of livestock in a prosperous condition was a solemn duty imposed upon the State. The present day Goshalas and Pasu Madams which are found as a necessary constituent of every temple, and the dedication of Brahmini bulls to Temples, have all a deep significance concerning the Livestock Development of the country, which unfortunately is lost at the present day. They are all now relics of good old institutions and the blame for this must rest on those who have been responsible for the disintegration of many such valued institutions of land. Incidentally, it is a matter for regret that we have not got any correct record

of the History of veterinary profession in this country and it is time that attempts are made to fill up this lacuna.

Now, what exactly is the present day position of the Veterinary Service in this Presidency? As one M.L.A., described it on the floor of the Assembly "It is the Cinderella of the Government Services". It is an apt and correct description. If I may express myself rather freely, questions relating to Livestock and Animal Husbandry have been viewed by our administrators with "amused indifference and apathy" and the members of the Veterinary Service have been kept ill-paid, ill-equipped and neglected for years on end. While all the Departments of Government expanded, and expanded very rightly, under the stress of the War, the Veterinary Department which should have been developed, organised and expanded to make a success of the campaign of "Grow More Food", was given the cold shoulder. In fact, I am not revealing any secret if I were to inform this gathering that when we wanted to hold a Conference in the year 1942 to formulate our plans and policies in regard to the "Grow More Food Campaign", we were not allowed to do so. Such has been the attitude of the Government towards this profession. Need we be surprised that the 'Grow More Food' campaign was not as great a success as it should have been? To the extent to which the Veterinary Services were neglected, to that extent the Livestock of the country deteriorated; to the extent to which the Livestock deteriorated, to that extent the Food Production especially Milk Production went down and with it the prosperity of the ryot also. These are a logical sequence of events which any one can easily understand. It is extraordinary that Saint Thiruvalluvar who is said to have lived about Two Thousand Years ago, very correctly prophesied what would happen if the Ruler of the country neglects his duty. In his immortal work of Thirukural he says "If the Ruler does not rule the country properly, then the cows will diminish in their yield". How aptly does this apply to the present day condition: In the words of Mahatma Gandhiji, it is the criminal neglect of the past that has turned the cow from a giver of plenty into a giver of scanty and our downfall started from the day when we started neglecting the cow.

The present condition of our cattle and, the miserable state in which they are in, are all well known to us. Suffice it to say, they are grossly underfed and ill-nourished. The conditions of these animals have been graphically described in the various reports which have been obtained periodically by the Government from enquiries into the agricultural and Livestock conditions of the country. I do not propose to take you over those reports. Thanks to the Viceroyalty of Lord Linlithgow, there has been no dearth of such enquiries and reports. We have indeed a plethora of them. If any indictment of the past is required it is found in ample measure in those reports. As a result of these enquiries, the Government

were being kept apprised of the deteriorated condition of the Livestock and a number of useful recommendations have been made from time to time for the improvement of their conditions and for the development of the Livestock industry of the country; but when it came to a practical application of even some of the most important of them, the Government has been found wanting.

Take, for instance, the Control of Contagious Diseases. In our Presidency, Rinderpest or Cattle Plague is responsible for nearly 50 percent of the total cattle mortality. It levies a toll of nearly 30,000 cattle annually. In terms of cash, this represents a loss of nearly 30 lacs of Rupees a year from actual deaths alone. The losses that accrue from the resulting debility, and diminished working and yielding capacity of the recovered animals are enormous. Even if we evaluate these losses at a Crore of Rupees we would still be under-estimating. And yet all these losses are from a disease which is preventable. We have a weapon by which we can prevent the losses by conferring a solid immunity on the animals which would last for some years atleast. Still the Government have not seen their way to adopt it on a vast scale! Why? Various reasons have been put forward from time to time and the latest is the paucity of trained Veterinary personnel. What exactly are the causes of this paucity of trained Veterinary personnel and what are the steps taken to rectify those causes? Here, Gentlemen, we are up against a wall. The Government know the cause but will not recognise it. They know that the cause is nothing but the poor pay and prospects of the profession but will not be just and fair enough to improve them. As a result, the Madras Veterinary College which is the only institution imparting Veterinary Education in this Presidency has not been able to attract students in adequate numbers. In fact, there have been years when the authorities could not secure even the requisite number of 30 students. All our attempts and all our representations to get the prospects improved have been without much of a success. We must here gratefully acknowledge the help, co-operation and sympathy extended to us by the *Indian Veterinary Journal* which has been consistently and persistently championing our cause. Our grateful thanks are also due to the local dailies in Madras like the *Mail*, *Hindu* and the *Indian Express* for espousing our cause. Latterly, however, an attempt has been made by the Government to improve the prospects. But we are afraid this attempt is a feeble one. It neither recognises the high standard of education undergone by the present day Veterinary Graduates nor does it appreciate the humiliations and sufferings undergone by the pioneers of the profession in popularising the Department. How I wish that the Government will stop tinkering with this question of the pay and prospects of the Veterinary Service and act boldly according to the common saying that the labourer is worthy of his hire! The representations that have already been made to Government in this matter deserve a favourable and sympathetic consideration.

The Royal Commission on Agriculture which drew up a report in 1928 postulated that there must be atleast one Veterinary Surgeon for every 25,000 head of cattle. On this calculation we would require atleast 1000 Veterinary Surgeons for this Province. How are we going to have this number, realising as we should, that the number has to be got as quickly as possible to prevent any further deterioration in the condition of our Livestock? On this point I will quote the following passage from a Professor of Statistics of the Madras University. "If the existing Veterinary College continues to admit 60 students every year, it will take 44 years for the number of Veterinary Assistant Surgeons to become 750, 76 years to reach a figure of 790, and 800 can never be attained assuming that there will be 40 successful candidates annually and all of them join the service. (Our target figure of 1000 is impossible of attainment). This clearly indicates the necessity of starting new Colleges for training the required number of Veterinary Surgeons". But, of course, this presupposes that the Government would make the Veterinary Service attractive: otherwise, even the one existing College will soon languish for want of support.

Such being the prospects of increasing the personnel of the Veterinary Department, the next thing we should think of is, are we making an effective and economic use of the existing Veterinary personnel? Is the maximum use being made of the available staff? At present nearly 50 per cent of the existing staff are on itinerating duty. They are mainly concerned with combating of outbreaks of contagious diseases. They have got a fairly big jurisdiction and they are so ill-equipped that very often they reach a scene of outbreak after the show is over, although, like a wandering Jew, they are on the move all the time. If on the other hand, a Field Mobile Motor Unit is organised for each District, and if it were to consist of a couple of Veterinary Assistant Surgeons assisted by 3 or 4 skilled assistants, these outbreak reports of contagious diseases could be attended to very promptly and effectively. The experience of one such Unit in Tanjore District recently should convince the Government of the practicability and effectiveness of such Units in each and every District. This is a point requiring the immediate attention of the Government; for unless this is done, unless the ravages of contagious diseases are kept under effective control, the ryot will continue to keep a 'surplus' number of cattle as an 'insurance' against the ravages of contagious diseases and these 'surplus' cattle will continue to eat up the little available fodder and aggravate more and more the already existing acute fodder problem. Further, these preventable deaths will continue to impoverish the ryot and increase his indebtedness. If a Field Mobile Motorised Unit is established in each District, then nearly 50 percent of the itinerating staff would be released for being engaged on expansion work. As it is, it is nothing but a pitiful waste to train students in the College for a long number of years and teach them

all about the latest developments in Veterinary Science and Animal Husbandry and then utilise them as mere Inoculators and Castrators. Not that there is anything *infra dig* in such work—we have all done it without a murmur—but it is bad economy to use highly trained personnel for simple routine duties which are within the capacity of skilled assistants.

Equally important to "Disease Control" or even more urgent than that, is our "Fodder Problem". This is a vital subject, because on it revolves the entire fabric of the economics of the Livestock. It is a major problem in Livestock development. According to the Royal Commission on Agriculture, no substantial improvement in the way of breeding our Livestock are of nutritional origin. Only about 20 per cent of our cattle are adequately nourished: the remaining 80 per cent are in various stages of gross under-nourishment and mal-nutrition. If even in such condition the cows continue to give milk and the bullocks continue to drag the plough, then is it not a thing to be wondered at? What will they not do if they are adequately nourished and looked after? Recently, however, a few enthusiasts have sprung up in this Province who have started a propaganda for the import of new breeds of cattle from Northern India as a short-cut to solve the existing milk scarcity. These people are totally misguided and quite ignorant of Livestock questions. Their action reminds me of the proverb which says, "where angels fear to tread fools walk airily". What is wrong with our cattle? They are only suffering from gross under-feeding. To quote from the Report of the Famine Commission, (1945), "The potentialities for increasing the yield of cows by proper management and feeding are considerable. Experience has shown that when village cows are put on Government Farms they give on an average about 60 per cent more milk in subsequent lactations and the yield of their progeny may be further increased by 10 or 15 per cent. The yields of indigenous breeds have been trebled or more in less than 20 years by selective breeding and proper feeding in Government Farms".

With this experience before us we should make earnest efforts to improve our own stock—the local stock of the locality—by proper feeding, management and breeding. Fodder for cattle consists of roughages and concentrates. Straw and hay constitute the roughages and according to our economists, we have only 60 per cent of our requirements. What about the balance of 40 per cent? My contention is that we should make up this deficiency by making full use of the Forest Grazing Areas and by encouraging the growth of fodder crops by the grant of subsidies in the form of irrigation facilities and remission of taxes. We should demonstrate practically the preparation of silage. In spite of the known food-value of silage, it is a matter for great regret that there is not even one single silo pit for demonstration purposes anywhere in the rural tract of this Presidency. Villages adjoining forests

which experience periodical gluts and deficiencies of fodder are ideal places for demonstration of silo, pits, and they must be undertaken by Government immediately. Similarly the manufacture of hay in forest areas which are usually closed for grazing. As regards supply of concentrates, which are usually closed for grazing. As regards supply of concentrates, which consist of cotton seed, oil cake, bran and pottu, we are in a bad state in that we have only about one fourth of our requirements. The recent ban on the export of groundnut cake should be of great benefit to us, but, here again, very unfortunately, the groundnut cake is being used directly, on the land as manure. Why not throw it on the land through the alimentary tract of our cattle? It will serve the double purpose of nourishing the cattle and manuring the soil. I need hardly say that starving cattle cannot produce much of manure. Without intake there can't be any output. This is a point requiring prompt action on the part of the Government. The other articles like cotton seed and Pottu or pollards of grains should in the first instance be obtained from surplus areas until in course of time we become self-sufficient even in regard to them. If we thus improve the condition of our Livestock, we pave the road for the improvement of the diet of human-beings. Animal Nutrition is necessary and indispensable for human nutrition because decline in Livestock leads to decline in Food production; and decline in food production leads to under-feeding and mal-nutrition of human-beings which in due course leads to decline in human physique. It is highly distressing that this point is not sufficiently realised by the Powers-that-be. While herculean efforts are being made for the importing of food-stuffs from abroad for human consumption, practically nothing has been done to conserve and improve the existing food available here. Cattle Fodder has become very scarce and even the little milk yield from our cows is going down. Our cows and bullocks continue to remain semi-starved and under-nourished. On that account valuable high yielding cows have been ruined. Surely, Gentlemen, we are not going to be dependent for all time upon other countries for our requirements of milk, cereals and pulses! This state of affairs should not be allowed to continue any longer and the Government must take immediate steps to provide enough fodder for our animals. Feeding of cattle and control of diseases are subjects which should have a high priority claim on the Government and I cannot press this point too strongly on their attention.

There are other subjects of topical interest which demand immediate attention of the Government, but I will not dilate upon them. One such subject is the bringing back of the Veterinary Serum Institute from Coimbatore to Madras and its conversion into a first class Biological Institute. This is long overdue and should not be allowed to remain pending any longer. It was true there was need for the transfer of the Institute to Coimbatore under the threat of invasion during the war, but

where was the necessity to dispose of the buildings which had been built up at great cost? This has been, and continues to be, an enigma to us.

Opening of Livestock Breeding farms in each district to give a practical demonstration to the people of the locality on the various aspects of Animal Husbandry, especially economic feeding of cattle, should not be postponed any longer. The condition of the peasant is going down day by day and it is time the Government act quickly and promptly and rehabilitate him soon in his pristine glory. I am here reminded of the following famous lines of the Poet :—

Ill fares the land to hastening ills a prey
Where wealth accumulates and men decay
Nobles and Lords may flourish or may fade
A breath can make them, as a breath has made them
But a bold peasantry, the country's pride
When once destroyed can never, never be replaced.

The same views have been expressed by Mahatma Gandhi, who, in his inimitable style, has expressed himself as follows :—“ Our salvation can only come through the Farmer and neither the Lawyers nor the Doctors nor the Rich land-lords are going to secure it.” And therefore the prosperity of the Farmer must be the first concern of a popular Government. The two legs on which the Farmer stands are his Lands and Livestock. He must be made to stand on these legs firmly and squarely. The development of one without the other would be unilateral and it will be neither stable nor sustained. Agricultural and Veterinary Services must be well organised for this purpose and, as I have already shown, the organisation of the Veterinary Services is far from being satisfactory. From the consideration of such simple things as the grant of uniforms to Hospital attendants and treating them as skilled assistants to the detailed planning required for the staffing of an Educational institution or the conversion of a Livestock station into a much-needed Nutritional and Genetical Research station, it has been one long agonising tale of lack of imagination, absence of sympathy and failure of understanding about the role of the Veterinary profession to the general welfare of the country.

Now that we have a ryot as the Minister in charge of our Service, and very rightly too, I, sincerely and fervently hope that there would be a correct re-orientation of the attitude of the Government and that the Veterinary Services, instead of being the Cinderella of the Services as at present, will become the Queen of the Services to enable the country to procure more and better food and to make the country-side flowing with Milk and Honey.

Now, Gentlemen, I thank you for your patient hearing and will conclude with the prayer which we are ordained to utter on all occasions like this viz. **MAY THE COWS PROSPER !**

The Hon'ble Mr. P. S. Kumaraswamy Raja, Minister for Agriculture and Livestock, Government of Madras, then declared the Conference open with the following speech :—

It was with very great pleasure I accepted the invitation extended to me by the All-India Veterinary Association, Madras Branch to participate in this Conference by declaring it open. I thank you for the honour you have done me. This Conference of the veterinarians from all over the province is of immense significance to the entire national economy. The fruitful deliberations of this Conference are bound to have direct bearing on the most acute problem of food supply which confronts the Government and the general public alike.

In this year, the whole country in general and this province in particular are passing through an unprecedented food crisis. Accustomed to consume primarily rice, the province is now threatened with growing scarcity of this staple cereal and the problem of nutrition is in the forefront as it has never been before. The serious short supply of cereals has turned everybody's attention to alternative sources of food supply. Next to Mother Earth, all look up to the cow, which symbolises the livestock wealth, for sustenance. At this juncture, the members of the Veterinary Association, I need hardly say, have a sacred trust because the health, well-being, and improvement of the livestock rest in their hands. Thanks to food scarcity the value and importance of livestock have come to be seen in their proper perspective and to that measure, the services you can render to the country are also coming to be properly appreciated. On account of this factor alone, let alone other equally important reasons—this conference will be of momentous consequences.

The importance of livestock as a vital factor in all civilisations cannot be over-stated. The peoples of ancient civilisations had so well understood it that many animals were treated as gods or mythological heroes. In antiquity cattle and sheep were an element not only in the food supply but also in artistic and religious activities. The practice of livestock husbandry is not recent; the Neolithic people domesticated animals and the ancient Egyptians possessed a certain amount of skill as breeders, feeders and packers. However the livestock industry in the western world did not undergo any remarkable change until the industrial revolution was well advanced, resulting directly in the growth of towns. The urban population in the newly sprung up industrial centres required imports of food from the rural parts as well as foreign countries. To meet this demand for additional food resources, new capital appeared to provide the means of expansion of the livestock industry on systematic lines in the great new lands of America, Australia, New Zealand and South Africa. The livestock industry was developed in range country where ideal pasturage was found. Millions of cattle and sheep raised

in these ranches were transported by railways to packing centres and with the help of refrigerators and canning industry, canned foods were sent to the Western European countries to feed the urban industrial population. I have described the causes and the growth of livestock industry in the west in some detail only to show that no base imitation of the western practice will serve to solve the problem of food in India. Economic conditions, racial and religious customs differ from country to country and slavish copying of what had been successful elsewhere in this country will produce unexpected and startling results. The salient features of the livestock industry in the west are that production is on the extensive or range basis and that production of meat rather than milk is the major aim. Now in India, stock farming on range basis is out of the question due to the high percentage of occupied area. Production will have necessarily to be on a farm flock basis where the flock or herd is only one element in farm economy. Again the primary objective of cattle-rearing must be a large supply of milk rather than meat. Owing to religious injunctions, beef is a taboo for the Hindu and the pork is a taboo for Mussalman. Hogs in the western countries constitute one of the most important sources of meat for human consumption and figure prominently in a proper agricultural economy. Any attempt at stock breeding that ignores these two vital differences between the western and Indian conditions will miserably fail to reach the goal.

At the same time, cattle play a pivotal role in Indian economy. India maintains more than 160 million cattle. Like the people they are overcrowded and inadequately nourished. "The bullock takes part in almost every agricultural operation. It helps to thrash the grain, draw the ploughs, raise water from the wells and irrigate the crops. Sure it is of the greatest importance to maintain at the highest level of efficiency such a general utility animal". The cow yields the milk, ghee and other products without which the essentially vegetarian Indian diet would lose its savour. Thus the male of the species supplies motive power to agriculture, the country's prime occupation and the female of the species supplies fats and proteins to the otherwise deficient Indian diet. These two services should offer the key to any development of the cattle industry. Cattle breeding operations, carried on in Government farms, are not done on an extension scale except in the Hosur Farm. The Veterinary Department of this province has a limitless field for service in this direction. The positive work of improving the breeds with the twin purpose of producing strong draught animals and excellent milch cows will require all your time for many more years. The success achieved so far in this country is not discouraging. Among the numerous strains and varieties of cattle to be found in India, already the Amrit Mahal bullocks have established a name; they are one of the best known fiery, active cattle. The Deoni breed are also good working animals; and the famous Kanrayam bullocks, bred by Pattagar of Palayakottai have very good constitution and are said to last from 10 to

12 years in work. Yet much more remains to be done. It will not suffice to breed new and strong strains at selected centres in small numbers but every one of the diminutive, half starved looking ox of the country-side should be replaced by a Kanrayam, Gaolao or Ongole. In this Conference, where experts have assembled, I am sure, you will devise practical schemes to achieve this objective within a limited period of 5 to 10 years. With regard to the distribution of pedigree bulls, the number of stud bulls at present represents only 1 per cent of India's requirements. Progress can only be achieved by increasing the number of approved stock raised in villages, the increase in the number of such "Seed Stock" and the purchase of these bulls for distribution. If you succeed in producing a blue print of your schemes, the Government will do their best to implement them with your co-operation. Success in this objective will transform the very texture of agriculture and the entire agricultural population of this province will owe you a debt of gratitude.

Dairy industry is one of the oldest industries and butter and cheese making existed at least as far back as 2000 B. C. Until recent times, however, dairying has been primarily a family or tribal enterprise for local consumption. But during the last 5 or 6 decades, it has grown into a flourishing industry in Denmark, New Zealand, Australia and the Netherlands which are the leading exporters of dairy products in the world. Dairy products have also begun to feature as a considerable item in international trade. In the world of dairy industry, India has no place, notwithstanding the fact that agriculture is her chief industry and her cattle population is the largest among the nations of the world. It is a matter bordering on the disgraceful thing that she is a net importer instead of being an exporter of dairy products.

It is usual to measure the importance of the dairy industry in the national life by one or the other of five criteria:—(1) The total number of dairy cattle, (2) the total production of dairy products (3) the percentage of the people engaged in and dependent upon the industry (4) the per capita consumption of dairy products and (5) the milk yield per cow. Although accurate statistics are wanting in this country, it may be stated, without being challenged, that the total production is deplorably low and the per capita consumption is appallingly small. It is said that the annual per capita consumption of whole milk in Finland is 84 gallons while in United States of America it is 55 gallons. The Indian per capita consumption has not reached even a few pints. The average per capita consumption of butter in New Zealand is 34 lbs. whereas in India the majority of the population know neither butter nor ghee. India has a per capita production of milk which is very low as compared with other countries; the annual production of milk per head of cattle in Denmark is

387 gallons and in Switzerland, Netherlands and Belgium 380, 373 and 362 gallons respectively, the annual production of milk per head of Indian cattle is only 30 gallons. The Danish cow yields nearly 13 times as much as the Indian cow. "The average yield of even well-known breeds", says Dr. Vera Anstey "is more than 6 lbs. of milk per day as compared with 20 lbs. produced by certain English breeds." But in recent years, the average yield is increasing. In 1935, a Sindhi cow yielded about 7717 lbs. in a year or a daily average of 17.7 lbs, while an Ongole cow has yielded a daily average of 21.5 lbs. in the milking period. It is, therefore, obvious that there is no inherent reason why the milk yield of Indian cows should not enormously be increased. In the realm of improved breeds of milch cows also, the Indian Veterinarians have a wide and fruitful field for research and experiment.

Milk is an indispensable item in the diet of infants, expectant and nursing mothers, invalids and many adults. In a predominantly vegetarian community, it is a necessity to give a balanced diet. Hence adequate supply of pure milk is a matter of public concern, particularly to urban dwellers. The age of the "family cow" is gone. In these days of acute milk scarcity—we may even call it milk famine—I need not dwell at length upon the importance of milk in the ordinary Indian diet. In this connection the breeding of water buffaloes will go a long way to augment milk supply. The Madras buffalo is less than half the weight of its counterpart in the north, for example, Punjab Murra and its milk output is very little more than sufficient to rear its calf. By merely crying for milk, a nation like babies, cannot get milk. To augment the supply of milk, the first step is animal breeding. The problem of reproduction and improvement are in reality the beginning; it is, therefore, fundamental that you, the veterinarians assembled here, should consecrate yourselves for this noble service to humanity of evolving better and still better milch cattle. In this, your task is not easy. Experiments in crossing, feeding etc. should be conducted with an indefatigable spirit. Systematic testing of fat and solids—not-fat should be done. The two main objectives of the dairy industry which you should always bear in mind are a decrease in the cost of production and an increased consumption. The dairy farmer must be able to feel that dairying is a profitable industry. At the same time, the consumers must not feel that milk is a costly luxury. It is only by increasing the yield per cow, by cheapening the cost of feeding each animal and by finding out the foods capable of increasing the milk yield that these twin objectives of decreasing the cost and increasing the consumption of milk can be attained. I commend to you this problem of the milch cow as worthy of your earnest study and attention. Milk supply cannot be increased in a day; but unremitting work in the farms and research stations is the pre-requisite for ultimate success; that work is already being done; but I wish it should be done with redoubled vigour.

In the great new countries of the Americas, and Australia, sheep industry is of great importance in the sphere of animal husbandry. Sheep farming has three objectives:—Growing sheep for wool, production of lamb and fattening of lambs for meat. All these objectives can be adopted without any modification for Indian sheep farming. In India vegetarianism is preponderant but it cannot be said with regard to all the vegetarians that it is a matter of free choice and not of necessity. The high cost of meat compared with the low purchasing power of the ordinary Indian naturally drives him to vegetarian habits. But due to this fact, the loss of efficiency and strength sustained by Indian labour is incalculable. As I have already said that beef and pork can never be the staple food in this country. So mutton in the national diet is of crucial significance. India possesses some 48 million sheep. Apart from the well-known Bellary breed which yields 4 lbs. 9 oz. of wool per head, and the Nellore sheep, breeding has not got any record to its credit in this province. Mountain breeds like the Bhadarwah, the Gurez and the Karnah of Kashmir give a fine lustrous wool suitable for tweeds and knitted goods. The Bikaneri wool is considered the best carpet wool in the world. However, a great agricultural country like ours must be not only self-sufficient with regard to cotton clothing but also woollen clothing. Hence experiments must be conducted to improve the breeds of mutton yielding and wool yielding sheep.

It has been observed that "poultry farming in most countries is regarded as the Cinderella of agriculture and in no country is this term more apt than in India, for until recent years practically no attention has been devoted to any branch of production." The total value of the hen and duck eggs sold is estimated at Rs. 5 and a quarter crores per year, and that of birds at Rs. 7 and a quarter crores at present. The introduction of white leghorns, Rhode Island Reds, Black Minorcas, Chittagongs and Tellicherry fowls has done considerable good to poultry industry. The crossbred ones give about 15 percent more eggs of about 50 percent greater weight. Yet, much leeway has to be made in this direction. Improved strains of fowls, geese, Turkeys and Guinea fowls will increase both the national wealth and improve the national diet. In this sphere also, you have a large field for experiments and national service.

I have rather dwelt at length on the positive good the Veterinarians can render at the present critical moment and for the avoidance of such food crisis in the future. This work has been placed in your hands since the transference of the livestock section from Agricultural to the Veterinary Department. This transference has been the result of a rational arrangement and also the source of much inspiration to do concrete and beneficial work to the agriculturists. No less beneficial is your original work of curing and prevention of animal diseases. From its establishment the Department has been engaged in the curative and preventive aspects of diseases. Rinderpest,

Haemorrhagic Septicaemia, Anthrax, Foot and Mouth diseases etc., have been completely stamped out in the Western European countries and have become things of the past. Equally effective measures, must be taken to eliminate these fell diseases from our country. In this sphere, your great experience in your long fight with these will help you to make constructive suggestions. Let them be practical and feasible to adopt and I assure you that the Government will try to put them into practice immediately. Measures for the prevention of diseases will entrench upon the individual rights of ownership. In the major interests of cattle welfare, Government will not hesitate to introduce any legislation capable of improving the cattle welfare in this country. The prevention, cure and eradication of diseases pertain to the technical side of your profession and I do not venture to offer any further suggestion on this vital matter.

The objects of your annual Conferences are manifold. You will, in this Conference, confer on various matters of interest for the uplift of the profession. You will also try to devise measures for the further progress of your activities. You will take stock of your work and achievements, compare notes with one another, settle doubts and difficulties in the way of thorough discharge of your onerous duties. I will be following your deliberations affecting these varied subjects with keen interest and I wish you success. I may also assure you that I will endeavour my best to sympathetically consider all your proposals. It is high time that your services to the general public are properly appreciated and your Department placed in a position it so well deserves.

I thank you once again for enabling me to associate myself with your Conference. I have great pleasure in declaring this Conference open.

After this Rao Sahib Sri K. Kylasamier, G.B.V.C., occupied the Presidential Chair amidst applause and then delivered the following address:

MR. KUMARASWAMI RAJA, MR. HURLEY, AND FRIENDS:

We have met here today under auspices unparalleled in the history of our Country for the last one hundred and fifty years and more. Not only is there a popular Ministry in the Province, but also a National Government for All-India at Delhi. We are thus at the threshold of a new era of political independence which we as a body of professional men and citizens of this country welcome. It is bound to have a profound effect on the lives and fortunes of all of us and let us hope that the Indian Veterinary Graduate will come into his own before long. Reviewing the events over the past twelve months since we last met, it is deplorable that our deliberations at the last Conference and the resolutions framed thereat and submitted to the Government for their consideration and suitable action, still remain to

be acknowledged. It may be that we are not in the list of Associations recognised by the Government but then common courtesy demands at least an acknowledgement. It is true that traditions die hard. Now that a popular Government is in office let us hope that hereafter the old traditions will not prevail to the extent of denying consideration of representations made by a body of scientific professional men in the best interests of the economic well-being of the country-side in general and of the Livestock industry and animal husbandry in particular. Recently there was an announcement by the Government that the Veterinary Department in this Province will function in future under the name and style of the Department of Animal Husbandry. I hope this change in name has a real significance and is symbolic of a new policy and programme of the future activities of the Department. The Veterinary Department had been, in the past, looked upon as a hand-maid to Agriculture—a Cinderella—with scanty recognition and soulless support. It is not yet sufficiently recognised that potentially livestock industry is as big and as important and vital to the health and economic prosperity of the millions of people in this country as any other industry. We the members of the Veterinary profession are best fitted by training and equipment to look after the animals of the farm in health and disease and we should resist the attempts to encroach upon our legitimate functions and activities in the domain of Animal Husbandry. But how do we stand and what are our resources in men and material at the moment? There has been a lamentable lack of imagination on the part of those at the head of affairs to foresee the requirements of the immediate and distant future for the development of Animal Husbandry and to make adequate provisions to ensure expansion and progress. We are actually at a standstill, and I am afraid it will not be possible to advance, for a long time to come, unless the Government realise the seriousness of the situation and take immediate action. At present the Department is so under-staffed that it is unable to cope with the programme of livestock development. It is so because the number of new entrants to the service is barely sufficient to replace the loss through retirement and casualties. The demand for more Veterinary Hospitals and dispensaries, breeding farms and many other essential items for the development of Animal Husbandry in the Provinces cannot be met for many years to come unless the annual supply of Veterinary Graduates is doubled or trebled. This year the number of new entrants to the Veterinary College at Madras was raised to 70 or so and even so at the end of five years the number graduating from this batch would only be about 40. There is also a proposal to provide additional accommodation at the Veterinary College to take in about a 100 students every year, but even so it is definitely beyond the capacity of one College to adequately meet the demand for more Veterinary Surgeons in this Province. And it is no exaggeration to say that most of the projected programme of work for the development and husbandry of livestock will be held up indefinitely. At the last Budget

session of the Assembly the matter of inadequacy of staff was brought forward by some members but not pursued to the extent of eliciting information as to what action the Government proposed to take to increase the staff. The only remedy to overcome this paucity of fully trained Veterinary men is one more Veterinary College in the Province. The Departments of Agriculture, Engineering, Law and Medicine have succeeded in convincing the Government of the need for more institutions for training men to meet their requirements and it should not be difficult to get the same facilities extended to the Veterinary profession. The need is not less urgent; indeed it is very much more and I hope this question will be taken up and given a high priority in the interest of livestock and rural economy. I appeal to you, Sir, and through you to your colleagues in the Ministry to view this matter sympathetically and make it an accomplished fact before long.

Gentlemen, you would have seen from the proceedings of the recent meeting of the Academic Council that the University has accepted the revision of the curriculum and course of studies leading to the degree of B.V.Sc., and the abolition of the concurrent Diploma course. To do away with the Diploma is a reform in the right direction but to shorten the period of training for the degree course to four years is a retrograde step especially as some of the more important subjects like Anatomy, Pharmacology and Surgery will be additional subjects for the degree examination with the abolition of the Diploma. I do not know if you Gentlemen happened to notice a reference to this subject recently in the editorial columns of the MAIL. I would invite you to read it if you have not already done so. We are grateful to the MAIL for its views on the subject and for the prominent publicity it has given in the interest of Veterinary education in the Province.

I should like to make a brief reference to the rumours of the revival of proposals for an All-India Veterinary College at Izatnagar. There was a proposal some years ago for some such institution, but it was dropped, I believe, as each Province wished to establish and develop a College of its own for Veterinary education. It is strange that while in the case of Medicine, Engineering, Agriculture, Law Etc., no All-India institution is considered necessary, Veterinary education should be singled out for such discrimination. Does it mean that the Provinces should not aim at giving Veterinary education of the highest standard in their Colleges? Otherwise there is no point in trying to establish a College for All-India for basic Veterinary education. A central institute for advanced post-graduate research is a different proposition and would meet with enthusiastic support all round.

I have already referred to the paucity of staff; but let us examine for a moment if the existing staff cannot be better utilised by a reorientation

of the departmental policy in regard to the itinerating staff known as the Touring Veterinary Assistant Surgeons. About 35 years ago, the then Superintendent of the Civil Veterinary Department, which was then in the course of formation, was hard put to it to devise ways and means of combating ravages of contagious diseases in the Province with a staff of a dozen or so of Veterinary Assistant Surgeons. That was the beginning of the Touring Veterinary Assistant Surgeon. Each of these Assistants had jurisdiction over one or more Districts and when not actually engaged in combating outbreaks he visited the outlying villages to make known the existence of the Department and render first aid to the village cattle for ordinary ailments. Since then the Department has assumed larger proportions and a re-alignment is overdue. The existing itinerating staff in the districts should be formed into a number of mobile units with full equipment to enable them to deal with outbreaks of contagious diseases as expeditiously as possible—these mobile units would include inoculators—a class of men officially designated Stockmen-Compounders to work under the supervision of Veterinary Assistant Surgeons. In this connection I would like to say a word or two about these Stockmen-Compounders. They should be either Stockmen to assist the Veterinary Surgeon in field work, or Compounders for Veterinary Hospitals and Dispensaries. The training for stockmen should be different and separate from that for compounders. To combine these two with the idea of making the same individual do the work of a compounder for some time and stockman at some other time according to the exigencies of service is to sacrifice efficiency for the sake of expediency. The proper place for training a compounder is a Veterinary Hospital and for a stockman, a livestock farm.

To tide over the present shortage of Veterinary personnel, I would suggest that the age for superannuation in the Veterinary service of the Province be raised to sixty as a temporary measure, or those under sixty who have already retired but are otherwise fit be re-employed. There are several such men in the retired list today whose accumulated knowledge and experience over a long period of professional career should be made available for a further spell of service at this juncture.

Unlike other countries where private practitioners form the bulk of professional associations, here there is no independent Veterinary profession and most of our members are men in service. However much one may try to avoid treading on service questions it is not possible to ignore them altogether on an occasion like this, especially matters of policy. We are not concerned with the claims of individuals but our representations on matters of policy should be heard by Government. We have had occasion recently to make a representation regarding the appointment of Deputy Directors and I hope the Government will be pleased to view them favourably so that the most deserving members of the service may have something to look forward

to towards the close of their service. There is yet another matter of concern to those senior men approaching the age of fifty, who are otherwise eligible for promotion to the gazetted rank. This rule is unnecessarily harsh and arbitrary and should be done away with. One man may be old at forty and another still young at fifty and quite fit. He should not be disqualified merely because of that age-limit. We are thankful to the Government for the measures already adopted towards the amelioration of the service conditions, and I would earnestly plead with our popular Minister for further improvement to ensure contentment in the interest of efficiency.

We are all aware of the food crisis we are passing through and the measures taken by the Government to avert starvation, but the fact that the cattle population of this Province are in a worse plight does not appear to have been sufficiently realised. Otherwise this supplemental source of food supply would not have been allowed to deteriorate to such an extent. In the city of Madras, for instance, the deterioration in the health and yield of milch cattle for lack of feeding stuff has assumed alarming proportions. The price of paddy straw, oil-cake etc., has risen so high as to make it impossible for even well-to-do people to maintain their cows and buffaloes in a fair condition for milk. The plight of professional milkmen is of course much worse and adulteration of milk is freely practised. It is high time that cattle fodder is made available at reasonable prices. If the present state of affairs is allowed to continue any longer most of the valuable milch cattle would deteriorate to such an extent as to make them useless for further breeding. Surely it should not be beyond the capacity and resources of the Government to introduce control in the matter of procurement and distribution of cattle fodder at reasonable prices. It is being done in Bombay. This is a matter for immediate attention and suitable action. Delay would only result in the loss of valuable milch cattle—a loss which this Province cannot afford or hope to replace for a long time to come.

Before I conclude, I should like to say a few words to my young friends in the profession. About forty years ago, when I started my career as member of the staff of this College the executive staff of the Civil Veterinary Department consisted of less than half-a-dozen Veterinary graduates. I am happy to be able to say that one of them Rao Sahib V. P. Subrahmanya Mudaliar is still with us. He is one of the pioneers whose industry and devotion to work in the early years of the formation of the Veterinary Service in this Province, has contributed not a little towards its growth, development and good name. Your heritage is a thing to be proud of and each one of you should endeavour to equip yourself by further studies and observation in the field so that you may be able to enhance your reputation as a professional man and add to the efficiency of

the service to which you belong. I cannot do better than recall the word of the poet for your guidance :

Let us then, be up and doing
With a heart for any fate,
Still achieving, still pursuing,
Learn to labour and to wait.

The Presidential speech over, Mr. K. S. Nair, Principal, Madras Veterinary College, requested the Hon'ble Minister to present the M. R. V. Panikker Memorial Medal to Sri Rama Rao, the best outgoing Graduate of the College. In doing so, Mr. Nair gave a short history of the institution of the Medal in the following speech :—

At a meeting of the A. I. V. A., Madras Branch held on the 29th January 1942, it was resolved that a memorial in the form of a medal or prize be instituted in the name of Mr. M. R. V. Panikker, a former Principal of the M. V. C., who died on the 7th January 1942, to be awarded annually to the best outgoing Graduate of the Madras Veterinary College. In pursuance of that resolution an appeal for funds was made to the members of the Veterinary Profession. The response has been very generous and the fund is still kept open. In the meanwhile, a sum of Rs. 1040 has been invested with the Treasurer of the Charitable Endowments, Government of Madras, with the Principal of the Madras Veterinary College for the time being as the administrator of the fund. Out of the interest so far accrued, the medal is presented for the first time this year to the student who is declared to be the best outgoing Graduate of the College in the examination held in March 1946. The recipient is Sri P. Rama Rao, G.M.V.C., who will now step forward to receive the medal at the hands of the Minister.

The Hon'ble Minister presented the medal to the recipient Sri P. Rama Rao amidst loud applause.

Rao Sahib Sri T. Vinayaka Mudaliyar then proposed a vote of thanks to the Hon'ble Minister Sri P. Kumaraswamy Raja and Visitors and, in doing so, spoke as follows :—

LADIES AND GENTLEMEN,

The pleasant task of proposing a vote of thanks has been entrusted to me and I indulge in no form of convention when I tell you how grateful, how elated and how honoured, the whole Veterinary profession in Madras feels over the presence of the Hon'ble Minister in our midst to-day. Belonging to an ancient family of Kshatriyas at Rajapalayam in Ramnad District, who exchanged their martial career to the more peaceful pursuit of

Agriculture and who converted their swords into plough-shares after the days of the mighty Pandya Kings, Mr. Kumaraswamy Raja comes to us with a definite bias for Agriculture and its allied occupations. Need I say therefore that he has raised in us great expectations. (*Loud Cheers*).

Ladies and Gentlemen, we have often been told that we are the Cinderella amongst the Government Departments in this Presidency. But I see there is an essential difference between ourselves and that little lady in the nursery tale. She was at least lucky to find a Prince to end her days of serfdom and bad treatment. But we have long been waiting for such a Prince. Will the Hon'ble Minister prove such a Prince, as his name indicates? Well, time alone should prove it.

Sir! We have outlived the days of nursery tales to gain any more satisfaction from them. We want to serve the common man or, as has been more aptly described, the forgotten man. Give us the tools, give us the facilities and give us the wherewithal to do our job satisfactorily and well—That is the *sumum bonum* of our requests to you.

We are aware, Sir, that the contribution of the Central Government for Post-War plans has been considerably reduced. But we wish to point out the Livestock work is a very slow process and as such must be given a high priority to give it an early start, if the India we dream of, if the India we love, is to be put on the livestock map of the world. Our prayer therefore is that all the schemes already drawn up, if not more, should be proceeded with and not dropped. (*Loud Cheers*).

Ladies and Gentlemen, it is really very good of the Hon'ble Minister to have spared us this much of time in these days of great stress and anxiety, when Man and Nature seem to have conspired together to bring about famine conditions against which, as we all know, the Ministry as a whole is putting up such a brave fight. All honour to them! On behalf of the Reception Committee I most heartily thank the Hon'ble Minister for his presence here to-day. (*Loud Cheers*).

There is yet time for us to felicitate the President of our Conference. Rao Sahib Kylasamier is the high priest of the Veterinary Profession in Madras. His able and mature guidance has always been a tower of strength to us. We thank him also for having accepted the presidential ghadi this year.

We are inspired with confidence and hope at the presence of Mr. Hurley, the Director of Veterinary Services, without whose co-operation and good will, the profession cannot make any head way in this Presidency. (*Cheers*). Our thanks are due to him.

Our thanks are also due to our popular Principal, Mr. K. S. Nair and his staff for co-operating with us and getting up the exhibition and allowing us the use of this hall. Finally on behalf of the Reception Committee, I thank you all, Ladies and Gentlemen, for so kindly responding to our invitation and thus honouring us in such an abundant measure. (*Loud and prolonged Cheers*).

The gathering then went round the Exhibition which had been very kindly organised by the Principal and staff of the Madras Veterinary College.

The Exhibition organised this year contained a good number of new items. One is struck by the posters vividly emphasising the importance of the Veterinary Profession to mankind. A miniature poultry farm forms a very "live" part of the exhibition. Other exhibits reveal that while the Veterinarian continues to be conscious of his responsibility with regard to treatment and control of contagious, parasitic and nutritional diseases, he now feels more concerned with the intensive breeding of useful types of livestock and rearing them on scientifically sound lines. Indeed, this year's Exhibition amply justifies the change-over from the name "Veterinary" to "Animal Husbandry".

A still another interesting feature was the fine show put up by Messrs. May & Baker (India) Ltd. This reputed firm of Pharmaceutical specialities had exhibited in a very attractive manner their various preparations and Dr. K. S. Krishnappa, the head of the Veterinary Department of May & Baker (India) Ltd., ably assisted by Mr. G. K. Rao, their representative, spared no pains in explaining to the Delegates and visitors the special features of these preparations. Judging from the number of people who were always round about that show, it was seen that there was real attraction in the "M & B" Section of the Exhibition.

It is to be hoped that such Exhibitions with popular appeal will be organised more frequently and in various centres in the province.

The Conference re-assembled under the Presidentship of Rao Sahib K. Kylasamier and elected members to the Subjects Committee, to discuss the various resolutions to be placed before the General Body.

In the afternoon, the Subjects Committee met and discussed the resolutions.

With this the first day's session was over.

Second day—Sunday the 29th September 1946

The Second day's proceedings commenced at 10 a. m. with a practical demonstration of Artificial Insemination by Sri. K. Chandrasekharan Nair, G.M.V.C., B.V. Sc., of the Madras Veterinary College. The use of the artificial vagina, the method of collection of semen, the dilution of the semen and the insemination of the cow, all these were clearly demonstrated and they were watched very eagerly by those assembled. After the practical demonstration was over, the gathering assembled in the College Hall with Rao Sahib K. Kylasamier in the Chair and spent the whole day in discussing the following professional papers, except for short intervals between 1 and 2 P. M., and 4 and 5 P. M.

1. Artificial Insemination—By K. Chandrasekharan Nair, B.V.Sc.
 2. Rinderpest Control in Tanjore District.—By George Ebenezer, G.M.V.C.
 3. Calves.—By R. Veeramoney, G.M.V.C.
 4. Osteoporosis of horses.—By M. Y. Mangrulkar, M.Sc., M.R.C.V.S., D.T.V.M.
 5. Contagious Castro-enteritis among sheep at the livestock research station, Hosur.—By M. Ramakrishna Pillai, G.M.V.C.
 6. Grazing :—By R. Veeramoney, G.M.V.C.
 7. Fodder grass.—By Narahari Rao.
 8. Veterinary Profession and its various inter-dependent Units.—By G. R. Viswanathan, G.M.V.C., P.G., (Edin & Mukl.)
 9. Dairy Industry in Madras—Can it be improved?—By K. V. Parthasarathy, G.M.V.C.
 10. A note on chronic infected wounds in animals.—By D. Krishnamurthy, B. V. Sc.
 11. Pasteurisation of Milk.—By M. S. Rajendran, G.M.V.C.
 12. A Note on glycosuria in rabies.—By D. Krishnamurthy, B. V. Sc.
- The following papers were taken as read as the authors were absent—
1. The indigenous Drugs of India—their Veterinary and economic aspect.—By A. Krishnaswamy, G.M.V.C.
 2. An outbreak of H. S. in cattle.—By B. Mohan Rao, G.M.V.C.
 3. Impaction and tympany in cattle.—By George Ebenezer, G.M.V.C.

Third Day—Sunday 30th September 1946

The Conference re-assembled at 1 P.M. and took up the various resolutions detailed in Appendix A for discussion. This was over at 5 P.M.

Rao Sahib K. Kylasamier then proposed a vote of thanks to one and all who had assembled to make the Conference a great success. He specially thanked the Principal of the Madras Veterinary College for lending the use of the College premises for the Conference and for the excellent exhibition that had been got up for the occasion. He thanked Mr. Krishnappa head of the veterinary department, May Baker Ltd., for having kindly participated in the Exhibition and put up his show with the various specialities of the Firm. This company of pharmaceutical specialities had printed the programme of the conference free of cost and our thanks are due to them. He also thanked the Warden of the College Hostel and the students of the College for all the arrangements they had made for the boarding and lodging of the Delegates in the Hostel. Concluding, he appealed to the members of the profession to gather in greater and greater numbers and make this Conference a regular annual feature hereafter.

Sri K. S. Nair, Principal of the College, by way of reply, eulogised the President on the excellent way in which he had conducted the Conference and exhorted the younger members of the profession to follow the example of the President in upholding the dignity and honour of the profession. He hoped that Rao Sahib Sri Kylasamier will continue to give the profession the value of his rich and mature experience.

With this the Conference ended.

(APPENDIX A)

THE PROVINCIAL VETERINARY CONFERENCE, MADRAS.

Resolutions Passed.

1. This Conference places on record its sense of losses at the passing away of Messrs. R. Narasinga Rao, P. Madhava Menon and Md. Rahimuddin Sahib.

Passed unanimously all standing

2. While reiterating Resolution No. 2 of 1945 Conference, this Conference is of opinion that immediate mass immunisation of the cattle in the Province against Rinderpest should be undertaken with the ultimate object of eradication of the disease.

Expl. Note :—The following extract from the Editorial of the Indian Veterinary Journal in its issue of July 1946 contains sufficient data for the subject of the resolution. "The average annual mortality for the past ten years from Rinderpest alone is over 15,000. Knowing very well how inaccurate the reporting of cattle diseases is, we will not be far wrong

if we were to put down the actual mortality at 30,000 a year. Calculating at a very modest rate of Rs. 100 as the value of each animal, the financial loss from this disease for Madras Province alone is *Thirty Lakhs of Rupees a year*. This is not all. There is the further economic loss from the diminished or totally suppressed milk yield, lowered vitality and working capacity of recovered animals and dislocation of agricultural work consequent on the incidence of this disease. If the epidemic were to break out at the commencement of the agricultural operations, then these operations are either at a stand-still, or, are very imperfectly and inefficiently carried out with the available cattle-power. The loss resulting therefrom is quite incalculable and, even if we compute it at a crore, we would still be underestimating. Thus, the disease entails a two-fold loss—loss from the actual mortality it causes and the loss from its sequelae, which is far more serious. It is these losses that have contributed materially to the poverty and perpetual indebtedness of the Indian ryot. Such then is the nature of the main cattle disease which has been aptly described as the scourge of the cattle of this land." Consequently it is highly necessary that intensive mass inoculation is undertaken immediately to be followed up by periodical protection of the growing young calves year after year.

3. Whereas the existing fodder problems have not been tackled and solved satisfactorily so far, this Conference resolves that the Government may be pleased to appoint an Expert Committee of agricultural economists and scientists with the following terms of reference :—

- (i) Immediate steps to relieve the existing acute scarcity of cattle food.
- (ii) Development of permanent pastures in the Presidency.
- (iii) Exploitation of the fodder resources in the major and minor forests.
- (iv) Growing of irrigated fodder crops in the existing delta areas and under the new irrigation projects.
- (v) Fixation of the ratio between the food, fodder and commercial crop cultivation in the Presidency, and
- (vi) Utilisation of oil cakes and cotton seed solely for cattle food.

Expl. Note :—The resolution is self-explanatory.

4. This Conference views with concern the paucity of trained personnel in Veterinary Science in this Presidency which is hindering the progress and development of Livestock Industry and is of opinion that a single College at Madras even with the increased number of admissions cannot cope with the needs of this Presidency; hence requests the Government to open another College preferably at Guntur.

Expl. Note :—The following extract from the speech of the Chairman of the Reception Committee of the Conference will be found interesting and explain the need for the above resolution. "The Royal Commission on Agriculture which drew up a report in 1928 postulated that there must be at least one Veterinary Surgeon for every 25,000 head of cattle. On this calculation we would require atleast 1,000 Veterinary Surgeons for this Province. How are we going to have this number, realising as we should, that the number has to be got as quickly as possible to prevent any further deterioration in the condition of our livestock? On this point I will quote the following passage from a Professor of Statistics of the Madras University. "If the existing Veterinary College continues to admit 60 students every year, it will take 44 years for the number of Veterinary Assistant Surgeons to become 750, 76 years to reach a figure of 790, and 800 can never be attained, assuming that there will be 40 successful candidates annually and all of them join the Service. (Our target figure of 1,000 is impossible of attainment). This clearly indicates the necessity of starting new Colleges for training the required number of Veterinary Surgeons".

5. This Conference reiterates the Resolution No. 6 passed at the Conference last year and requests the Government may be pleased to revise the pay and prospects of the Veterinary Assistant Surgeons to bring them on a par with those of the Assistant Surgeons of the Madras Medical Service.

Expl. Note :—The subject of this resolution is a hardy annual and the proceedings of no Veterinary Conference are complete unless it expresses its views about the poor pay and prospects of the members of the Veterinary profession in Government Service. It is very unfortunate that the Government have not so far seen its way in recognising the fairness and justice of these claims. The Resolution No. 6 mentioned in the above resolution runs as follows :—"This Conference requests that the Government may be pleased to further revise the pay and prospects of the Veterinary Assistant Surgeons to bring them on a par with those of the Assistant Surgeons of the Madras Medical Service". In communicating that resolution to the Government last year, it was clearly explained that the Veterinary Graduate is in no way inferior to the Medical Graduate as far as his qualification and course of studies are concerned. It is therefore earnestly requested that the Government as the chief agency in utilising the services of the Veterinary Graduates, would set a good example by adopting the motto that every labourer is worthy of his hire, and grant the Veterinary Graduate a status and rank equal to the scientific equipment and training.

6. This Conference recommends to Government that in the revisions of the pay of the Veterinary Assistant Surgeons, they may be pleased to fix the salaries in the revised scales by taking into consideration the number of years of service they have already put in as was done on previous occasions.

Expl. Note :—The need for this resolution has risen from the fact that in a recent revision of the pay of Veterinary Assistant Surgeons in this Province the Government ordered the fixing of the salaries in the revised scale in accordance with the instructions contained in F.R. 22-A-II. The result of this is seen in the following highly deplorable state of things :—
 (i) There are 180 Veterinary Assistant Surgeons with a service ranging from 1 to 11 years drawing a pay of only Rs. 90 per mensem. (ii) There are 18 Veterinary Assistant Surgeons with a service ranging from 11 and 12 years drawing a pay of Rs. 105 per mensem. (iii) There are 72 Veterinary Assistant Surgeons with a service ranging from 14 to 28 years drawing a pay of only Rs. 135. (iv) There are 27 Veterinary Assistant Surgeons with a service ranging from 16 to 19 years drawing a pay of only Rs. 155. (v) There are 68 Veterinary Assistant Surgeons with a service ranging from 20 to 28 years drawing a pay of only Rs. 170. The above figures very well illustrate how the members of a scientific body are treated when once they enter Government service, and therefore it is highly essential that these points are borne in mind in the fixation of salaries in any proposed revisions of salaries. Only then the men in service would be benefitted by the revision. It would also serve as some consolation for the sufferings they have been undergoing all along. When the pay was revised in the Police Department quite recently the fixation of pay in the revised scale was according to the length of service. When the pay was revised in the Veterinary Department in 1942 and also on earlier occasions a similar procedure was adopted. Under these circumstances, it is earnestly requested that the same procedure may be adopted in future also.

7. *This Conference reiterates the resolution No. 13 of last year's Conference which runs as follows :—" This Conference is of opinion that the propaganda work connected with rural uplift and reconstruction should be the concern and responsibility of a Special Department of Propaganda consisting of Health, Veterinary, Agricultural and Co-operative Departments to work in unison under specially trained Officers "*.

Expl. Note :—There is nothing more to add to what has already been said last year.

8. *This Conference is of opinion that the members of the Teaching Staff of the Madras Veterinary College should be designated as Professors and Assistant Professors instead of Lecturers and Assistant to Lecturers as at present.*

Expl. Note :—In all Colleges affiliated to the University, the Teachers and their Assistants are designated as Professors and Assistant Professors and such a designation is in keeping with the dignity and status due to them. The Madras Veterinary College is an affiliated institution of the Madras

University and the teaching staff who are all provincialised must be designated properly. The present designation of Lecturers connotes a certain amount of inferiority of status to the general public and to the members of the profession which is not quite warranted. As such, a change in the designation of the Teachers as suggested in the resolution has become necessary.

9. *This Conference requests the Government may be pleased to authorise all Veterinary Graduates to issue and grant certificates for export of animals overseas without the necessity of a counter signature.*

Expl. Note :—The present rule is that no certificate for export can be issued by the staff of the Civil Veterinary Department unless it is countersigned by the head of the Department. This does not serve any purpose. The counter-signing officer has no opportunity of examining the case himself and his counter-signature is more of an administrative nature than anything else. Further, the Veterinary Assistant Surgeons at Negapatam and Tuticorn are even now permitted to issue certificates without any counter-signature, and the request contained in the resolution is only for an extension of this procedure.

10. *This Conference is of opinion that the Graduates of the Indian Veterinary Colleges be declared eligible for permanent King's Commission in the I.A.V.C.*

Expl. Note :—Before the war only Indian members of the R.C.V.S., were granted permanent commission in the Army. During the war this rule was relaxed and the 4 or 5 years Graduates of the Punjab and Madras Veterinary Colleges were granted temporary commissions. With the termination of the war, it is found that the recruitment is being done on pre-war rules. This, in effect, has put a ban on the Graduates of the Indian Veterinary Colleges which is totally unfair. In view of the high standard of education obtaining in the Punjab and the Madras Veterinary Colleges it is represented that the recruitment to the I. A. V. C., should be open to the Graduates of these Colleges.

11. *This Conference is of opinion that it is necessary to lay down bacteriological standards of milk so as to ensure a wholesome and clean supply of milk to the consumer.*

Expl. Note :—At present there is no Bacteriological standard for milk laid down in the Food Adulteration Act and therefore even if the milk is grossly contaminated there is no provision in law by which the milk vendor can be proceeded against. This is a vital defect in the Act and it is high time that this defect is rectified.

12. *That in view of the unsatisfactory conditions of the existing fish and meat stalls in the Presidency, this Conference recommends to*

the Government to instruct the Corporation and Municipalities to open model meat and fish stalls with adequate facilities for cold storage so as to enable the other stall owners to copy and install such hygienic shops to survey meat and fish.

Expl. Note :—The resolution is self-explanatory.

13. This Conference recommends to the Government that the posts of Veterinary Assistant Surgeons in charge of leading Veterinary Institutions in the Presidency be gazetted.

Expl. Note :—At present there are some Veterinary Hospitals in the Presidency where the work has of late grown enormous. Not only has the average daily attendance increased, but the nature of the work also has become very varied in character specially since the transfer of the Livestock Section to the Veterinary Department. Maintenance of breeding bulls and running of Poultry Units have become a more or less regular feature of these institutions. The work has therefore become very arduous and responsible. This increased and added responsibility has unfortunately not been followed up with a corresponding increase in the status of the Officer in charge of the institution. He still continues to occupy a subordinate position and as such he is not able to command that amount of confidence and regard either from the public or from other Departments of the Government which a gazetted Officer of the Government does. This in turn sooner or later is bound to affect the efficiency of the institution and therefore in the opinion of this Conference it is highly necessary that these posts are soon Gazetted.

14. This Conference requests the Government to appoint immediately a Special Veterinary Officer as has been done in Punjab and other Provinces to expedite the post-war schemes relating to Animal Husbandry including the opening of breeding farms.

Expl. Note :—The post-war schemes drawn up by the Government of Madras contain plans for expansion of the activities of the Veterinary Department also. The enthusiasm with which these schemes were formulated is not at present evident and many of them remain on 'paper' only. As it is not possible to examine these schemes along with the routine administration of the Department and as it is essential in the general interest of the country that these schemes are given an early start, it is highly essential that a Special Veterinary Officer is appointed to scrutinise the plans and estimates of these schemes and expedite their early carrying out, especially the starting of breeding farms which are so badly needed for this country.

15. This Conference requests the Government to appoint Special Veterinary Officers in all the new irrigation projects such as Tungabadhra

and Ramapadhasagar projects to study and report on the development of Livestock under changed conditions.

Expl. Note :—It is a well-known fact that wherever new irrigation projects are introduced the nature of land also becomes altered. The animals living in these altered conditions take time to get accustomed to the new factors and till then they want careful looking after. Otherwise, they are bound to suffer. To avoid this suffering and to effect this "change over" smoothly it is very necessary that a close watch is kept on the altered conditions and the reaction of the Livestock to those conditions. It would then be easy to suggest suitable remedies then and there. Valuable data would become available if a special officer is posted to this work even at the commencement of the new irrigation projects so that there would be an intensive study of the existing conditions.

16. This Conference requests the Government that a meeting of all the Gazetted Officers of the Department be convened at least once a year for discussion of professional and administrative subjects.

Expl. Note :—No special explanatory note is necessary for this resolution. The Conference will be the occasion for the exchange of ideas and for comparing notes and discussing difficulties. The educative value of such meetings is therefore enormous.

17. This Conference requests the Government to sanction the establishment of Artificial Insemination Units at suitable centres in the Presidency.

Expl. Note :—Artificial Insemination has now reached a practical stage and it is high time that it is taken advantage of for improving our Livestock. The paucity of adequate breeding bulls of the correct type is very great and it would therefore be an advantage if a few Artificial Insemination Centres are started especially in Government Breeding Farms and in Grazing areas where large numbers of animals congregate.

RAO SAHIB K. KYLASAMIER,
President.

**THE ALL-INDIA VETERINARY ASSOCIATION,
MADRAS BRANCH**

Proceedings of the Annual General Body Meeting of the A. I. V. A.
Madras Branch, held at the Madras Veterinary College on
Monday the 30th September, 1946, at 10-30 A.M.

MEMBERS PRESENT :—

- | | |
|--|--------------------------------|
| 1. Kailasam Ayyar, K. Rao Sahib,
<i>President</i> | 42. Sri E. R. Nagarajan |
| 2. Swaminathan, R.
<i>Chairman, Reception Committee</i> | 43. „ K. S. Nair |
| 3. Sri T. L. Anantaraman | 44. „ T. Narayanan |
| 4. „ V. S. Alwar | 45. „ P. S. Natarajan |
| 5. „ T. S. Alagappa Pillay | 46. „ B. Narayana Rao |
| 6. Mr. M. Abdul Khader | 47. „ S. Padmanabha Rao |
| 7. Sri V. Anjaneyulu | 48. Mr. C. T. Peter |
| 8. „ R. A. Balaprakasam | 49. Sri G. Pandurangam |
| 9. „ G. B. Balagurunathan | 50. „ C. V. Padmanabhan |
| 10. „ G. Balasubramanyam | 51. „ M. Ramakrishna Pillai |
| 11. „ K. Chandra Menon | 52. „ K. V. Raghavachari |
| 12. „ K. P. Chandrasekharan Nair | 53. „ R. Rajamannar |
| 13. „ K. P. Doraiswamy | 54. „ T. Ramabrahmiiah |
| 14. Mr. J. D. David | 55. „ S. Ramaswami |
| 15. „ G. Ebenezer | 56. „ K. Rangathan |
| 16. Sri M. S. Ganapathi | 57. „ G. Ramanujachari |
| 17. „ K. Gopalakrishnamurti | 58. „ Y. Ramanujam |
| 18. „ K. Govinda Sastry | 59. „ A. Ramachandran |
| 19. „ R. N. Govindaswamy | 60. „ P. Rama Rao |
| 20. „ K. N. Govindan Nair | 61. „ M. Ranga Rao |
| 21. „ V. Gurumurti | 62. „ V. Royappa-Reddi |
| 22. „ B. Hanumantha Rao | 63. „ R. Ramakrishnan |
| 23. Mr. C. J. John | 64. „ H. R. Rangaswamy |
| 24. „ S. Jacob | 65. Mr. M. S. Rajendran |
| 25. Sri V. Janakiramier | 66. Sri B. Ramiah |
| 26. „ P. P. Karumbiah | 67. „ G. Somasundara Rao |
| 27. „ M. V. Krishna Rao | 68. „ T. Subramanyan |
| 28. „ Y. Kameswara Rao | 69. „ Srinivasa Rao Panhal |
| 29. Sri S. Krishnamurti | 70. „ S. Seshadhri Iyengar |
| 30. „ D. Krishnamurti | 71. „ P. Subbarayulu |
| 31. „ A. Krishnaswamy | 72. „ M. R. Subramanya Sastry |
| 32. „ K. S. Krishnappa | 73. „ P. Srinivasan |
| 33. „ O. Lakshmana Rao | 74. „ T. Sivaraman |
| 34. „ K. Lakshminarayanan | 75. „ R. Srinivasan |
| 35. „ K. Mallikarjuna Rao | 76. „ B. Sambamoorthy |
| 36. „ A. S. Mahadeva Iyer | 77. „ R. B. Sarma |
| 37. „ M. Y. Mangrulkar | 78. „ K. Trivikrama Rao |
| 38. „ A. R. Madhusudan | 79. „ C. T. V. Tilak |
| 39. „ D. Mariappa | 80. „ P. M. Thillanayagam |
| 40. Mr. R. D. Michael | 81. „ M. Umapathi Rao |
| 41. Sri K. T. K. Nambiyar | 82. „ G. R. Viswanathan |
| | 83. „ G. Venkataratnam |
| | 84. „ S. Veithinetha Mudaliyar |

Proceedings of the Annual General Body Meeting of the A.I.V.A., 271

- | | |
|----------------------------|--|
| 85. Sri D. Veeraraaghavan | 92. Mr. J. C. Victor |
| 86. „ A. V. Veeraraaghavan | 93. Sri Velayuthan Nair, C. K. |
| 87. „ R. Veeramony Iyer | 94. „ Rao Sahib T. Vinayaka
Mudaliyar |
| 88. „ S. Vancheswaran | 95. Mr. F. D. Wilson |
| 89. „ R. Venkataraman | 96. Sri C. Madhavan Nambiyar |
| 90. „ V. Venkataraman | |
| 91. Sri C. B. Viswanathan | |

The Secretary presented the following report of the Managing Committee.

This report covers the period from 7th April 1945 to 30th September 1946.

Membership.—The number of members on the roll on 7th April 1945 was 199 Ordinary Members and 15 Life Members, making a total of 214 Members. 5 Members resigned, 3 died and 24 ceased to be Members owing to arrears of subscription. During the year, 55 new members were admitted, and 14 were re-admitted on payment of arrears. The total number on the roll today is 243, comprising of 224 Ordinary Members and 19 Life Members.

Meetings.—The Managing Committee met 15 times during the year.

Activities.—The Association conducted a Provincial Veterinary Conference for the second year in succession. Mr. K. S. Nair was the President, Mr. R. M. Sundaram, I. C. S., opened the Conference and Rao Sahib Sri T. Vinayaka Mudaliyar was the Chairman of the Reception Committee. The Conference was acclaimed as a great success and the Members present took very keen interest at the Conference. As usual the proceedings were published in the *Indian Veterinary Journal* and a copy of the reprint was supplied to all the professional brethren in the Presidency.

14 Resolutions were passed at the Conference and these were forwarded to the Government with an explanatory note to each resolution. It is a matter for profound regret that the Government was not pleased even to acknowledge the receipt of the resolutions nor to send any reply in spite of 3 reminders. It is to be sincerely hoped that matters will improve hereafter.

The Government was requested to give a representation to this Association on the Provincial Livestock Improvement Board but the Government did not see their way to comply with our request.

The Association considered the recent advertisements of the Government for the recruitment of Deputy Directors in the C.V.D., Madras and the Lecturers at the Madras Veterinary College and sent up a representation to

the Government protesting against the terms of recruitment and specialty requested that there should not be a ban on the *alumni* of the local Veterinary College for higher posts. No reply has so far been received from the Government.

Another representation was made to the Director of Veterinary Services, Army Headquarters, New Delhi, about the advertisement that appeared in the papers restricting the recruitment to I. A. V. C., to members of the R. C. V. S. The Director of Veterinary Services has replied that the present arrangement to recruit from members of the R. C. V. S., is only a temporary one, that the interests of the Graduates of the Indian Veterinary Colleges are being carefully watched and that it is likely that plans will be finalised in the near future. He has also added that as it is not possible to furnish details yet, it is better to wait a little longer for fuller information.

The Association gave a party to Sri K. S. Nair and Sri R. Swaminathan on their appointment as Director of Veterinary Services, and Principal of the Madras Veterinary College, respectively. It was also "At Home" to Rao Sahib T. Vinayaka Mudaliyar and Rao Bahadur R. Swaminathan on the New Year Honours conferred on them.

Lastly the Panicker Memorial Fund instituted by the Association has reached a figure of Rs. 1131-2-7. A sum of Rs. 1040 has already been invested with the Treasurer of the Charitable Endowments, Government of Madras. The Principal of the Madras Veterinary College for the time being is the administrator of the fund. The fund is still kept open. In the meanwhile, out of the interest accrued, the first medal has been awarded this year and the recipient is Sri P. Rama Rao of the 5th year Class of the Madras Veterinary College.

The statement of receipts and payments for the year is appended below.

Mr. K. S. Nair moved the adoption of the report. Mr. M. V. Krishna Rao seconded it and it was carried unanimously.

Mr. K. S. Nair moved the following resolution.—"That this meeting is of opinion that the A. I. V. A., Madras Branch" be called "The Madras Veterinary Association". Mr. V. Gurumurti seconded it. This was carried unanimously.

Mr. G. Venkatratnam moved that the rules of the A. I. V. A., Madras Branch be adopted in *toto* by the Madras Veterinary Association. Mr. V. Gurumurti seconded it. This was carried unanimously.

The election of the office-bearers then took place. Rao Sahib K. Kylasamier expressed a desire to stand aside as he has been far too long

the President of the Association. At the same time he assured that he was always ready to help the Association in all possible ways whenever required. On this, Mr. V. Gurumurti proposed the name of Sri R. Swaminathan for the Presidentship. This was seconded by Mr. M. V. Krishna Rao and was carried *nem com.*

The election of the Managing Committee then took place. The following members were elected to the Managing Committee :—

1. Rao Sahib K. Kylasamier
2. Sri Panjal Srinivasa Rao
3. „ P. A. Parthasarathy Naidu
4. Rao Sahib T. Vinayaka Mudaliyar
5. Sri K. S. Nair
6. „ G. R. Viswanathan
7. „ M. R. Subramaniya Sastry
8. „ M. Y. Mangrulkar
9. „ A. Krishnaswamy
10. „ R. Venkataraman
11. Mr. C. J. John
12. Sri D. Veeraraghavan
13. „ V. Gurumurti
14. Mr. J. C. Victor

With a vote of thanks to the Chair, the Meeting terminated.

Balance Sheet from 16-7-45 to 26-9-46.

RECEIPTS.	Rs. A. P.	PAYMENTS.	R. A. P.
By opening balance ...	1,699 6 0	To investment with A. G. Madras for M.R.V. Panikkar Mem. Fund.	1,040 0 0
„ interest for 1944-45 and 1945-46 ...	32 15 11	„ Parties	360 0 0
„ donations for parties ...	98 0 0	„ conveyance charges.	2 15 0
„ subscriptions for Association	129 0 0	„ printing & postage ...	123 14 3
„ receipts towards M. R. V. Panikkar Fund ...	10 0 0	„ miscellaneous expenses.	14 6 3
„ deposits out of collections for 1946 Conference ...	200 0 0	Bank Balance ...	620 2 0
		Cash on Hand ...	8 0 5
Total ...	2,169 5 11	Total ...	2,169 5 11

There is a closing balance of Rs. 628-2-5 (which includes a sum of Rupees 91-2-7 besides a war prize bond for Rs. 10 only).

M. R. SUBRAMANYA SASTRY,
M. Y. MANGRULKAR,
Auditors.

V. GURUMURTHI,
Treasurer.

THE MADRAS VETERINARY ASSOCIATION

Proceedings of the Managing Committee Meeting of the Madras Veterinary Association held on 21st October 1946 at 5 p.m. at the Madras Veterinary College Library.

MEMBERS PRESENT:

1. Sri R. Swaminathan (*President*)
2. „ Rao Sahib K. Kylasamier
3. „ Rao Sahib T. Vinayaka Mudaliyar
4. „ K. S. Nair
5. „ M. Y. Mangrulkar
6. „ M. R. Subramania Sastri
7. „ Panjal Srinivasa Rao
8. „ R. Venkataraman
9. „ V. Gurumurti
10. Mr. C. J. John
11. Sri D. Krishnamoorthy was co-opted.

The following Resolution was passed on the motion of the President, all standing:—

- (1) That this meeting of the Managing Committee of the Madras Veterinary Association places on record its sense of loss at the demise of Rao Sahib V. P. Subramania Mudaliar, the oldest member of the Profession and conveys its condolences to the members of the bereaved family.
- (2) The Treasurer presented the accounts of the 1946 Conference. This was considered and passed. The sum of Rs. 96-14-0 spent in excess of receipts is to be made good from the General fund of the Association. Resolved that, as the expenditure has exceeded the receipts, steps should be taken to avoid a repetition of it on future occasions.
- (3) Resolved that (1) Sri P. A. Parthasarathy Naidu be elected as Secretary (2) Sri M. R. Subramania Sastry be elected as Treasurer.

With a general discussion on the future programme of the Association, in which special stress was laid on getting recognition of the Association by the Government, the meeting terminated at 7 p.m.

Rao Bahadur R. SWAMINATHAN,
President.

THE ALL-INDIA VETERINARY ASSOCIATION.
THE INDIAN VETERINARY JOURNAL.
Statement of receipts and payments for the year ending 30th June 1946 (Vol. XXII).

RECEIPTS.		PAYMENTS.	
	Rs. A. P.		Rs. A. P.
To Balance on 1-7-1945	4,877 10 10	By Paper, printing and blocks	4,277 3 2
„ Subscriptions, including V. P. charges	6,339 0 3	„ Postages	1,231 15 6
„ Loose sales	144 3 0	„ Printing & Stationery	111 7 6
„ Sale of Reprints	86 0 0	„ Books & Periodicals	61 15 0
„ Advertisements	1,850 5 0	„ Honorarium to the Editor	1,000 0 0
„ Bank Interest	150 0 0	„ Rent	480 0 0
		„ Salary to Typist	780 0 0
		„ Binding exchange journals	59 8 0
		„ Bank charges	4 14 0
		„ Repairs to Typewriter	4 0 0
		„ Audit fees	25 0 0
		BY CLOSING BALANCE:—	
		F. D. in Bank	5,000 0 0
		S. B. Account	411 3 11
Total	13,447 3 1	Total	13,447 3 1

Examined and found correct.

K. GOPALAKRISHNA RAO,

Registered Accountant and Auditor.

20, Thambu Chetty Street,
Madras.
26th October, 1946.

College News

MADRAS VETERINARY COLLEGE.

Names of students who passed the Supplementary Diploma Examination held in October 1946.

1. A. S. Krishnamurthy
2. S. Venkaswamy Rao.

Madras, }
8th Oct. '46. }

K. S. NAIR, G.B.V.C., M.R.C.V.S., D.T.V.M.,

Principal.

BIHAR VETERINARY COLLEGE, PATNA.

Supplementary Examination, 1946.

Sl. No.	Name	Position	Name of D. B. and Governments
1.	J. N. Harbola	1st	U. P. Govt.
2.	R. Mahapatra	2nd	Talcher State
3.	Bhoodeo Sharma	3rd	U. P. Govt.
4.	Ram Nagina Singh	4th	do.
5.	Suresh Prasad	5th	Bihar Private
6.	S. K. Naithani	6th	U. P. Govt.
7.	Braj Raj Singh	7th	do.
8.	Zia Ahmed	8th	do.

Patna, }
21st Oct. 1946. }

P. G. MALKANI, B.A., (Hons.)
B.Sc. (Lon. Vet.) M.R.C.V.S.,
Principal.

Correspondence.

Grant of permanent regular commission in Indian Army Veterinary Corps,

[In reply to a reference on the above subject made by us to the Army authorities, the following reply has been received by us which we publish for the benefit of our readers—Editor I. V. J.]

The position with regard to commissions in the I. A. V. C. is explained below:—

(a) Before the war only Indian M. R. C. V. S. were granted permanent commissions in the I. A. V. C.

Graduates from Indian Veterinary Colleges were eligible for Warrant Officers or 'V. C. Os' rank only.

(b) During the war the grant of permanent commissions was stopped and instead emergency commissions were instituted. These commissions were originally opened for Indians with M. R. C. V. S. qualification. Later on, four or five years graduates from Punjab and Madras Veterinary Colleges, who were either already serving in the I.A.V.C. as V.C.Os. or were from the open market, became eligible for emergency commissions. Three years graduates had, however, still to join as V.C.Os. but after one year's service as such they also became eligible for emergency commissions.

(c) With the conclusion of hostilities the grant of emergency commission has been stopped and plans for the future are under consideration.

(d) Pending the finalisation of these plans for the post-war I.A.V.C. we have reverted to the pre-war method of granting permanent commissions which did not require a fresh sanction from the Government of India. This is, however, an interim measure only and does not necessarily mean the exclusion of graduates of Indian Veterinary Colleges from consideration for permanent commissions in the I.A.V.C.

(e) Their interests are being carefully watched and it is likely that plans for their future will be finalised in the near future. It may, however, be mentioned that four-year graduates who have already served or are serving as emergency commissioned officers and the B.V.Sc. of the Punjab and Madras Veterinary Colleges stand a reasonable chance of being benefitted, but pending the formal approval of the Government of India it is not possible to furnish the details and you are requested to wait a little longer for fuller information.

General Head Quarters,
Quartermaster General's Branch,
New Delhi,
17th September, 1946.

Colonel.
for Director of Rem. &
Vety. Services in India.

Facilities for G. M. V. Cs. to take the B. V. Sc. degree.

Sir,

You will be glad to hear that at the instance of the Board of Studies in Veterinary Science, the Academic Council of the University of Madras at its meeting held on 14-9-45 passed a motion and resolved :—

(i) That the following be incorporated in the Chapter governing the B. V. Sc. Degree—viz. Chapter LXV-Vol. I, part II, Calender 1942-43, at page 257, as the last regulation :—

"Graduates of the Madras Veterinary College (G. M. V. Cs.) will be eligible to take the B. V. Sc. Degree of the Madras University, provided they—

(a) have passed the Matriculation Examination of this university or an Examination recognised by the syndicate as equivalent thereto,

(b) have subsequently undergone a course of study for two academic years in a Veterinary College affiliated to or recognised by the university,

(c) have during this period of two academic years passed the B. V. Sc. intermediate Examination Part I and Part II and

(d) have passed the B. V. Sc. final Examination at the termination of the two academic years or thereafter.

*Note :—*The above concessions will be granted only to the Diploma holders who took their Diploma prior to the institution of the B. V. Sc. degree and the above regulation will be in force for the duration of the war and for five years thereafter"; and

(ii) that the above regulation shall take effect forthwith.

It can be seen from the above that this regulation is already in force and I request you to publish this information in your esteemed *journal* as quickly as possible so that intending candidates may avail of the above concessions and seek admission into the College from the academic year 1947-48 and obtain the B. V. Sc. Degree before the regulation ceases to be in force.

MADRAS
6th November 1946. }

Yours Sincerely,
M. R. SUBRAMANIA SASTRY,
P. A. to the Principal, Madras Veterinary College.

Trained Personnel.

Sir.

One of the impediments for the rapid development of the resources of this country, is the paucity of trained personnel. This may be met by the following methods :

(1) By direct recruitment of suitable personnel either from within or without this country. This is a gamble. You may get by chance the right type of men. A study of such recruitments in the various departments should provide the Government with the necessary data as to whether this is a satisfactory method or not.

(2) By selecting and sending for training suitable men with special aptitude for such work. This is undoubtedly a good method. But the selection should not be left to individual officers, but should be done by a departmental board, composed of two or three retired officers of that particular department, with the head of the department as Chairman.

(3) By husbanding and making the best use of the available local talent in the form of experienced officers of over thirty years of service, and who retire under superannuation rules. If India ever needed the services of such men, it is now when so many of the Post-War development schemes are held up for want of trained personnel. It is a criminal waste of talent to allow such men to idle away their time, when they are otherwise fit and when the country needs such men, more particularly in scientific and technical departments. These men may be employed on what may be called extension schemes either on short-term contracts or as a separate cadre, so that the men in service may not be affected and they, in their turn, will also be utilised when the time comes. The object is merely to make the utmost use of the rich experience of such officers, in these days of paucity of hands.

When I hear the talk going round on the paucity of trained personnel, I am reminded of a proverb in Tamil which says "it is like the man who was hunting frantically for ghee when he had the butter with him."

Neither false prestige, nor an inelastic man-made rule should be allowed to stand in the way of acting in the best interests of the country.

17-11-1946.

PRO-BONO-PUBLICO.

WE ANNOUNCE THE INTRODUCTION OF
UREA SULPHAZIDE OINTMENT

5%

For topical use in infected wounds, ulcers, burns etc. Urea Sulphazide ointment contains Sulphanilamide, Urea and Azo dye chemical compound. The combination is therefore most suited to give a therapeutic effect of each ingredient enhanced by synergism.

NOT FOR EYE AFFECTIONS

Obtainable in one ounce containers ready for immediate use.

UNION DRUG CO. LTD. CALCUTTA.

T'phones :
Cal. 1159.
Cal. 4975.

285, BOWBAZAR STREET
CALCUTTA

T'Gram
"Benzolic"
Cal.

TENALINE

The Wholly Efficient Taenifuge

**FOR
DOGS**

Manufactured by :—

WILLOWS, FRANCIS, BUTLER & THOMPSON, LTD.

73/75, Shacklewell Lane, London, E. 8
ENGLAND

Phone :
GLISSOLD 6361 (6 LINES)

Grams :
"FORTY, HACK, LONDON"

When writing to advertisers, please mention this Journal.

GLYCOSOL
SPECIAL FOR FOOT & MOUTH DISEASE

Director of Dairy Research, Imperial Dairy Department,
Govt. of India, Bangalore, writes :

"Trials were again undertaken during the present outbreak of Foot and Mouth among the Dairy herd here. Glycosol tried as a mouth wash has been found to be efficacious."

TICKSOL
A WONDERFUL TICK DESTROYER

The Tick destroyer sample is of great use and a successful cure, I have found and there is great demand from my clients for the same."

Veterinary Dispensary, Vyara, (Dt, Navsari)

A product of

The Chemicals & Fertilizers Mfg. Co., Ltd.
POONA 2.

Manufacturer of Chemotone for more milk, Cattle Food, Horse Condition Powder, Dog Pills, Ointments for Yoke-galls, Tumours, Hoof ailments, Livingall for Rinderpest and for all diseases of Cattle, Horse, Dogs and Poultry.
(Distributors all over India.)

Reliable Veterinary Products

For Passive Immunisation

TETANUS ANTITOXIC SERUM

2000 and 6000 I. U.

For Active Immunisation

TETANUS ANATOXIN

in 25 c.c. and 50 c.c. phials

For Active Leucocytosis

NUCLEIN

10% solution of nucleic acid in 5 c.c. ampoules

BENGAL CHEMICAL

CALCUTTA

BOMBAY

When writing to advertisers, please mention this Journal.

FOR
VETERINARY INSTRUMENTS,
DRUGS, PATENT MEDICINES,

Repairs to Instruments A Speciality.

Apply to:—

R. N. PARANJAPÉ & SONS,
P. B. NO. 2230
BOMBAY 2.

STANES MINERAL MIXTURE

Stanes Sterilised Fine Bonemeal for Cattle

The only Tonic at low prices with high tonic value.
Prevents diseases due to deficiency in CALCIUM and
PHOSPHORUS. Largely used by all the Agricultural
Research Stations in Madras, and by the Veterinary
Departments.

Sold in bags of 14 lbs., 28 lbs. and 56 lbs. for supply in the
Madras Presidency.

For further particulars Apply to:—

T. STANES & CO., LTD.,
COIMBATORE.

THE JOURNAL OF THE ROYAL ARMY VETERINARY CORPS

The Journal of the Royal Army Veterinary Corps is a Quarterly
Periodical which will appear on February 1st, May 1st, August 1st and
November 1st of each year. It is published at the Royal Army
Veterinary School Aldershot.

The Journal is sold at the price of 3s. per copy or 10s. 6d. per
annum post paid to any part of the world. Reduced rates are available
to the undermentioned:

Serving other ranks, R.V.A.C., Annual Subscription 7s. 6d.
Single Copy 2s. each.

Personnel of the Indian Army Veterinary Corps. Annual
Subscription Rs. 5. Single Copy, Re. 1-4.

A discount of 10 per cent is admissible in respect of accredited
commercial agencies.

All communications and enquiries should be addressed to the Editor

THE JOURNAL OF THE ROYAL ARMY VETERINARY CORPS
ROYAL ARMY VETERINARY SCHOOL
Thornhill, ALDERSHOT

When writing to advertisers, please mention this Journal.



The DRUG of the YEAR
SULFADIAZINE

Specify
Lederle



Sulfadiazine Tablets
Bottles of 20, 50 and 1000
0.5 gram (7.7 grains) each
Solution Sodium
Sulfadiazine
Ampoules of 10 cc.
25% solution
Sulfadiazine
Ointment 5%
1 oz. tubes
Sulfadiazine with
Tannic Acid Jelly
1 oz. tubes

Sole Agents for India: THE ANGLO-FRENCH DRUG CO. (ESTD) LTD. P.O. BOX 400, BOMBAY.



in Canine Practice

PRODUCT

★ **STOVARSOL**
Brand
Acetarsol

★ **ACETYLARSAN**
Brand
Diethylamine Acetarsol
Solution

★ **M & B 693**

★ **SOLUSEPTASINE**
Brand
Solution

★ **TRADE MARK**



INDICATION

Nervous sequelæ of distemper, anæmia, chronic skin affections, emaciation following helminthiasis, and as a general tonic.

General tonic for parenteral administration in debility, malnutrition, anæmia, helminthiasis, chronic skin affections and nervous disorders: well tolerated by subcutaneous injections.

Chemotherapy of streptococcal, pneumococcal, staphylococcal and many other bacterial infections. Useful in Canine distemper.

For the treatment of hæmolytic, streptococcal and other pyogenic infections, by parenteral administration. Well tolerated subcutaneously.

PACKING

Containers of:
50 x gr. 4 tablets.
250 x gr. 4 tablets.

Boxes of 6 x 2 c.c.
ampoules.
(9.40 percent. solution)

50 x 0.5 gm. tablets.
250 x 0.5 gm. "
1000 x 0.5 gm. "

20% solution
Bottles of 30 c.c.
" 300 c.c.
10% solution
Boxes of 10 x 5 c.c.
ampoules.

MAY & BAKER LIMITED

Distributed by **MAY & BAKER (INDIA) LIMITED**