

The Indian Veterinary
Journal

1941 - Sep - Nov

VOL. 26. NO 2 and 3.

JL
KZM2, N24
N49.26.243
79840

278

THE

INDIAN VETERINARY JOURNAL

PUBLISHED BI-MONTHLY

(THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION)

26, WALLAJAH ROAD, MOUNT ROAD P. O., MADRAS-2 (S. INDIA)

Vol. XXVI.

SEP. & NOVR. 1949

Nos. 2 & 3

468

1 - FEB 1950

bovine metritis

After prolonged clinical trial **PROPAMIDINE—M & B** Intra-Uterine Injection is now available as a form of therapy offering an encouraging ratio of success in sub-acute and chronic metritis in cows.

Administration is by uterine catheter, and from two to three fluid ounces is considered adequate in most cases. Treatment may be repeated at 48-hour intervals, the usual course consisting of three injections. More complete information relating to Propamide—M & B Intra-Uterine Injection will be supplied by our Veterinary Department on request.

SUPPLIES:—Bottles of 26-fluid ounces



manufactured by **MAY & BAKER LTD.**

Distributed by **MAY & BAKER (INDIA) LTD.**

JL
KZ m2, N24
N49.26.2 & 3

OFFICE OF THE
LIBRARIAN OF BOOKS

Fresh Stocks Arrived

Burdizzo Castrators, Cordstop, Italy sizes, 19", 16", 13" and 9"
Ranch Record Syringes, Veterinary, U.S.A. 20 cc. with spare glass
barrels with metal plungers
Record Syringes 'Original Record' Italy, capacities, 20 cc, 10 cc,
5 cc and 1 cc.
'De Lux' Veterinary Inoculation Needles, Stainless Steel, U.S.A. sizes
15G x 1 1/2", 17", 16G x 1 1/2", 17", 14G x 4"
Bull Rings, Self-Piercing, Arnolds, London, sizes 2 1/4", 2 1/2", 2 3/4" and 3"
Horse Hair Clippers 'Climax' Martins, English
Gum Elastic Catheters, Horse, English
Gum Elastic Tubes for Reeds Enema Pumps, English
Burdizzo Tattooing Forceps, 3-Spaces, Italy
Set of numbers 0-9 for above
Set of letters A-Z for above
Burdizzo Tattooing Ink, Black, Italy
Burdizzo Tattooing Ink Paste (Germicide) 1 oz. Collapsible Tubes in
Colours of Red, White and Black, Italy
Burdizzo Trocar and Canula, Oval & Round, Italy
Burdizzo Hoof Secueters, Italy
Burdizzo Hoof Knives, Right & Left, Italy
Burdizzo Sheep Shearing Scissors, 12", Italy
Veterinary Thermometers, Hobdays Specification, English
Revolving Tattooing Outfit 'Franklin' U.S.A. with 4 adjustable endless
chains of numbers 0-9
Stomach Tubes 'Korosel' U.S.A. 10', Oil Resistant
Caponizing Set U.S.A. (Latest improved pattern)
Medicated Wax Teat Dilators, U.S.A.
Artificial Insemination Outfit Complete in a Field Metal Case 'Franklin'
U.S.A.
'Brand Em Ol' for Chemical Branding, Franklin, U.S.A.
Special Brand Em Ol Irons, 0-9 & A-Z size 4", for above, 'Franklin'
U.S.A.
Mouth Floats, with extra Rasp plates, 'Franklin' U.S.A.
Artificial Inseminating Tubes Plastic, U.S.A.
Hand-Powered Hair Clippers 'Burman' U.S.A. complete with Stand

For further particulars, please write to:

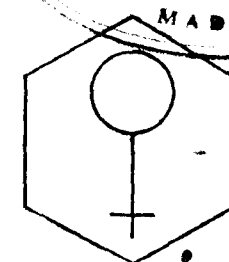
Messrs. CIRUGIA DE LUX

Manufacturers & Importers of Veterinary Instruments

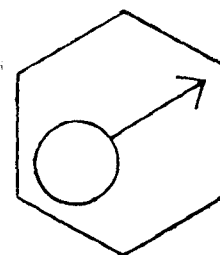
24, CHOWRINGHEE ROAD. :: CALCUTTA - 13.

ANTOSTAB

— VETERINARY —



A Gonadotrophic Hormone for the treatment of
Sterility. Anæstrus. Impotence. Azoospermia and
other sexual disorders in Domestic Animals.



Antostab Veterinary is issued
as a sterile stable powder in
ampoules containing 1,500 I.U.
and is administered by
intramuscular injection.

Manufactured by

BOOTS PURE DRUG CO. LTD. Nottingham, England.

Distributed



in India by

BOOTS PURE DRUG COMPANY (INDIA) LIMITED

P. O. Box 680
BOMBAY

P. O. Box 2070
CALCUTTA

P. O. Box 29
FORT COHIN

When writing to advertisers, please mention The Indian Veterinary Journal.

ADVERTISEMENTS



T.C.F. VITAMIN B-COMPLEX FOR INJECTION

The early administration of high doses of T.C.F. Vitamin B-Complex in distemper prevents complications particularly the nervous form, and the whole course of the disease is favourably influenced.

T.C.F. KUBISMIDE KURCHI BISMUTH IODIDE

For therapy of intestinal disorders, to be given in half tablets or less according to body weight, in a bolus.

T.C.F. BISMUDERM

A dry dusting powder, for skin affections and wound treatment.

Also suitable for polo ponies.



TEDDINGTON CHEMICAL FACTORY LTD., BOMBAY

Sole Distributors:

W. T. SURÉN & CO., LTD., P. O. BOX 229, BOMBAY, 1.

Branches:

CALCUTTA: P. O. BOX 672



MADRAS: P. O. BOX 1286

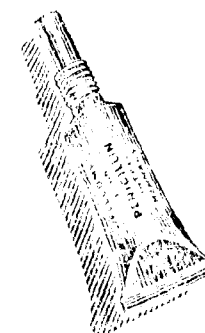
When writing to advertisers, please mention The Indian Veterinary Journal.

ADVERTISEMENTS



MADRAS

FOUR POINTS IN FAVOUR



20,000, 50,000 AND
100,000 UNIT-DOSE
TUBES

- No risk of cross-infection
- Ease of administration
- Maximum effect—no wastage
- No interference with milk yield

For the treatment of
STREPTOCOCCAL BOVINE MASTITIS

'WELLCOME' PENICILLIN INTRAMAMMARY INJECTION (VETERINARY)



BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd. Incorporated in England) **LONDON**
AND COOK'S BUILDING, HORNBY ROAD, BOMBAY

When writing to advertisers, please mention The Indian Veterinary Journal.

ADVERTISEMENTS

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 :
"Benzoic"
Cal.

ENTERO-QUINOL

(IODOCHLOROXYQUINOLINE)



Specific for all forms of Amoebiasis and other intestinal infections.

It is chemically 5 Chloro 7 Iodo 8 Oxyquinoline, practically odourless, tasteless, and insoluble in water.

Tubes contain 20 tablets 0.25 grm. each.



EAST INDIA PHARMACEUTICAL WORKS LTD.

TOLLYGUNGE :: CALCUTTA

When writing to advertisers, please mention The Indian Veterinary Journal.

ADVERTISEMENTS

For Chemotherapy by oral administration in bacterial infections

TRADE MARK

'M & B 693' BRAND
SULPHAPYRIDINE

TRADE MARK **'THIAZAMIDE'** BRAND MADRAS
SULPHATHIAZOLE

TRADE MARK **'THALAZOLE'** BRAND
PHTHALYLSULPHATHIAZOLE

'M & B 693' and 'Thiazamide'—highly potent compounds within the systemically active group of sulphonamide drugs—merit special consideration in the treatment of generalised bacterial infections, in which they have proved to be consistently effective.

'Thalazole' has been accepted by the veterinary profession as the compound of choice in bacterial infections of the intestinal tract. Compared with other sulphonamides the amount absorbed is remarkably small, permitting maximum drug concentration at the site of infection.

Fully detailed literature on the complete range of sulphonamide drugs is available on application to our Veterinary Department.

Supplies—'M & B 693' tablets available in containers of :
20 x 0.50 Gm., 250 x 0.50 Gm., 1000 x 0.50 Gm.
Powder available in containers of 25 and 500 Gm.

'THIAZAMIDE' tablets available in containers of :
20 x 0.50 Gm., 50 x 0.50 Gm., 250 x 0.50 Gm.
Powder available in containers of 25 Gm.

'THALAZOLE' tablets available in containers of :
50 x 0.50 Gm., 250 x 0.50 Gm.

MAY & BAKER

BOMBAY · CALCUTTA · LUCKNOW · MADRAS · KARACHI · LAHORE · COLOMBO

When writing to advertisers, please mention The Indian Veterinary Journal.

B

The Indian Veterinary Journal

(The Journal of the All-India Veterinary Association)

Vol. XXVI

SEPT. & NOVR. 1949

Nos. 2 & 3

CONTENTS

I. General Articles

A Single Dose Prophylactic Vaccination of Dogs Against Rabies.—By J. R. Dogra, M.D., ...	165
Panting in Cattle.—By F. C. Minett. ...	174
Systemic Alkalinization with Sodium Bicarbonate in the treatment of cold of horses.—By Arcadio C. Gonzaga, D.V.M., Ph.D. ...	182
Recent Advances in Sheep Breeding Methods in the United States of America.—By Lt. C. Krishna Rao, B.V.Sc., M.S. (Calif.) ...	186
Indian Hides & Skins and Veterinary Science.—By R. N. Soni and Gian Singh ...	196
Genital Hypoplasia in the Juvenile Female Pigeon due to Androgenic treatment.—By Amiya B. Kar, M.Sc., Ph.D., ...	201

II. Editorial

Veterinary Council for India ...	205
The XIVth International Veterinary Congress ...	207
The Indian Dairy Research Institute, Bangalore ...	209
Personal.—G. Venkatachalam, B.Sc., G.M.V.C., M.Sc., Ph.D. (Mich.) ...	209
T. R. Tavargeri, G.B.V.C., P.G., Poona ...	210
P. Srinivasan, G.M.V.C., B.V.Sc., M.Sc. ...	211

III. The World Food Situation—By Lord Boyd Orr, D.S.O., M.S., F.R.S. ...

IV. Clinical Articles

A Case of <i>Nanomelus</i> in a calf.—By G. R. Murkibhavi, G.B.V.C. ...	216
A Case of <i>Schistosomus reflexus</i> in a calf.—By R. B. Sarma, G.M.V.C. ...	217
Contracted tendons in a bull calf.—By G. Y. Pansare, B.Sc., G.B.V.C. ...	218
Hæmorrhagic Septicæmia.—Successful treatment with Sulphapyridine (M. & B. 693).—By Harjas Rai, L.V.P., A.I.D.R.I. and A.D. Lilaramani ...	219
Tiger-mauled cases—Successful treatment with Penicillin.—By S. B. Galigi, G.B.V.C. ...	220
Canine Distemper—Its treatment with Soluppyridine and Sulphathiazole (M. & B.)—By M. S. Ganapathy, G.M.V.C., B.V.Sc. ...	221

PAGE

Distemper in dogs and its treatment with Soluppyridine.—By D. Nilakanta Ayyar, G.M.V.C. ...	223
<i>Schistosoma spindalis</i> infection in a cow—Treatment with Anthiomaline (M. & B.)—By S. N. Vaidyanathan, G.M.V.C. ...	225
<i>Ascaris vitulorum</i> —Prenatal infection in calves.—By S. N. Vaidyanathan, G.M.V.C. ...	228

V. Association News

Bombay Veterinary Medical Association.—Proceedings of the 27th Conference held in April 1949 ...	231
„ Resolutions passed ...	234
„ Welcome Speech.—By S. R. Chadha, B.Sc., M.R.C.V.S. ...	237
„ Secretary's Report ...	239
„ Presidential Address.—By D. S. Laud, G.B.V.C., F.R.H.S., F.Z.S. ...	243

Madras Veterinary Assistant Surgeons' Service Association—Prefix of "Dr" to Veterinarian ...	260
All-India Veterinary Association—Postponement of Conference and Diamond Jubilee Celebration of the Bombay Veterinary College ...	260
Change of name—Madras Serum Institute ...	260
All-India Veterinary Association—Statement of receipts and payments of the Indian Veterinary Journal, Vol. XXV. ...	261
Indian Veterinary Journal Silver Jubilee Celebration Statement of receipts ...	262

VI. College News

Bihar Veterinary College—Supplementary Diploma Examination Result, July 1949 ...	263
Madras Veterinary College—„ „ Sept. 1949 ...	263

VII. Review

Poultry Farming.—By S. G. Ganapathy Ayyar, B.O.L. ...	264
---	-----

VIII. Obituary

Late Rai Bahadur Nilmoni Chatterjee, G.B.V.C. ...	264
---	-----

GET MORE MILK

By feeding your milch cows with SAGI—a strong nutrient feed and digestive tonic 20 to 60% more milk assured.

Genuine testimonials.

Try once and be satisfied. Suppliers to Dairy Farms, Gaushalas & Veterinary Hospitals. One complete course 9 lbs. Rs. 9.

For particulars apply to :

KOHSAR STORES
SERAI HAKEEM, ALIGARH, U.P.

Vol. XXVI

Sept. & Nov. 1949

Nos. 2 & 3

THE INDIAN VETERINARY JOURNAL

[THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION]

PUBLISHED ON ALTERNATE MONTHS

A BI-MONTHLY
RECORD OF
VETERINARY
SCIENCE.



DEVOTED TO THE
CAUSE OF THE
VETERINARY
PROFESSION.

(ESTD. 1924)

EDITOR

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

Office: 26, Vallajah Road, Mount Road, Madras-2 (S. India)

All communications should be addressed to the Editor.

Advertisements should be in the hands of the Editor not later than the 25th of the preceding month.

Subscription payable in advance { Rs. 6 or 10s. per annum to members of profession. Single copy Rs. 1-8-0 or 2s. 4d.
Rs. 10 or 18s. per annum to Govt. and all public institutions. Single copy Rs. 2 or 3s. 4d.

Members who do not receive the Journal regularly, or who find it wrongly addressed, are requested to communicate their correct address to the Editor at once. Non-receipt of a particular issue should be intimated before the receipt of the subsequent issue; otherwise, they will be charged for.

THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XXVI

SEPT. & NOVR. 1949

Nos. 2 & 3

General Articles

A SINGLE DOSE PROPHYLACTIC VACCINATION OF DOGS AGAINST RABIES *

By

J. R. DOGRA, M.D.,
Haffkine Institute, Bombay.

Introduction

It gives me very great pleasure to be with the present and the future Veterinary Surgeons of the Province of Bombay and to speak on my recent researches covering a subject which is of mutual interest and importance and one that needs much greater attention than what it has received in the past. Without going into the details regarding this viral infection and its manifestations in animals with which all of you, I am sure, are completely familiar I would draw your attention to the landmarks of discovery which brought about the unveiling of the mysteries of Rabies.

The earliest reference to rabies is said to be that of Aristotle in the fourth century B. C. Hippocrates who preceded Aristotle by about fifty years and who wrote about most things then known made no mention of the disease. Whereas Celsus in the first century A. D. mentions the disease, Coelius, Aurelianus and Galen in the second century A. D. gave a very good description. Nothing appears to have been added to our knowledge in the next fifteen or sixteen centuries. In 1804, Zinke artificially infected healthy dogs, rabbits and fowls by painting the saliva of mad dogs on freshly made wounds. Gruner, 1813, recommended inoculation of test animals with the saliva of suspected dogs to establish diagnosis. The first actual demonstration of the identity of the disease in man and animals is accredited to Magendie and Breschet, 1821, who successfully induced rabies in dogs by injecting the saliva from a man suffering from Hydrophobia.

*A paper read at the 27th Conference of the Bombay Veterinary Medical Association, held at the Bombay Veterinary College, Bombay, on the 15th April, 1949.

The next great landmark in the advance of knowledge of the subject we owe to Pasteur and his colleagues Chamberland and Roux who made pioneer experiments by which they demonstrated constant occurrence of the rabies virus in the central nervous system of the diseased animals, the possibility of cultivation of this virus in the rabbit brain, the preparation of the "fixed virus" and the first experiment in protective inoculation against rabies in dogs. On the 6th of July, 1885, Louis Pasteur injected and saved the first case, a nine-year old boy, Joseph Meister, who had been badly bitten by a mad dog, with a vaccine made from the dessicated cord of a rabid animal and thus established the utility of rabies prophylaxis in man.

In India, a central committee of the Pasteur Institutes' Association was formed in Lahore in April, 1893, but the first Pasteur Institute of India was not actually opened for the treatment of cases till August, 1900. This was the first and the only institute for the treatment of patients in India until 1907, when the Pasteur Institute of Southern India was opened at Coonoor. Treatment of rabies and preparation of anti-rabic vaccine was still confined to these institutes because the hotter climate of the plains was not suitable and the transport of the vaccine in use at the time was not feasible. With the introduction of Semple's carbolised dead virus vaccine and the availability of refrigerators and air-conditioning plants, it became possible for other places to prepare the vaccine as well as to administer treatment even in very hot climates. Since then, Pasteur Institutes have been started at Rangoon (1915), Shillong (1917), Calcutta (1924), and Patna (1929). A rabies section, now the Department of Virus Diseases, was opened at the Haffkine Institute, Bombay, in 1922. Anti-rabic Treatment Centres based on the above Pasteur Institutes for supply of vaccine have been opened up all over the country where the vaccine is adequately stored in refrigerators and administered by specially trained officers.

Rabies, I submit, can be controlled effectively by legislation of control measures planned on a nation-wide basis. Control measures, in addition to other things, would include licensing of dogs—the principal agents incriminated for the spread of rabies in man—and their compulsory vaccination. Whereas adequate immunity may be ensured in dogs by multiple injections with various antirabic vaccines available, to make the dog-prophylactic-vaccination a practical and popular proposition, it would be necessary to make available a vaccine which would afford the necessary protection to dogs with one injection for a sufficiently long period of time. In search for this ideal vaccine this work was undertaken.

UMENO and DOI (1921) successfully checked a widely spreading rabies scourge in Japan resulting from the First World War. These Japanese workers used a 20 per cent rabbit brain fixed virus phenolised vaccine in doses of 6 cc. per 15 Kg. body weight. Of the 44,484 dogs

vaccinated, one died from accidental causes following vaccination, and in one case vaccination failed to produce sufficient immunity against natural exposure, whereas rabies raged amongst the unvaccinated animals. This vaccination of dogs resulted in an overall reduction of rabies by 75 per cent, the disease occurring only in dogs which were not immunized. Hata (1924) recorded further statistics to show the efficacy of the Umeno vaccine.

CORWIN (1924) reported satisfactory vaccination of 1600 dogs with at least six of the vaccinated dogs having been bitten by a known rabid dog. None of these animals developed rabies.

EICHHORN and LYON (1922) vaccinated 6 dogs which successfully resisted the injection of a dose of street virus which proved fatal to the three controls—the latter developing rabies. The vaccination was done by inoculating 5 cc. in one injection of UMENO and DIO vaccine and test virus challenge dose of 0.05 to 0.1 c.c. of dog brain emulsion in saline (1 gm. in 10 c.c. saline) being administered intraocularly 15 days after vaccination.

SCHLINGMAN (1925), working with a phenolised vaccine prepared from brains and cords of dogs, subjected it to incubation at 37°C followed by refrigeration for "a length of time sufficient to destroy the virus as determined by subdural injection of rabbits". This vaccine which was a 4 per cent suspension afforded a high degree of protection in dogs against relatively large amounts of intracranial infection.

KELSER (1930) worked with chloroform-treated anti-rabic vaccine, which was 33½ per cent rabbit brain fixed virus vaccine inactivated with 1 per cent chloroform and aged for two weeks. In a large series of animals this author was able to protect animals successfully *with two doses* of vaccine and to claim that he "protected against subdural infection approximately half of the rabbits inoculated". The results were satisfactory even with a single dose vaccination except that the protection was against intramuscular test virus challenge infection, which, in controls, caused rabies varying from 40 to 80 per cent only. KELSER, however, stressed that owing to such a very marked and wide difference between the incidence of the disease in vaccinated and control animals there was "no doubt as to the protection afforded by the vaccine".

BARNES *et al* (1934) after extensive experimental work tentatively concluded that carbolised vaccines did not immunize dogs against rabies. All the vaccines tested by them were obtained from commercial sources. They opined that "there undoubtedly is a successful way of immunizing dogs against rabies, but neither the proper method nor the proper vaccine seems to have been found".

OLESEN (1935) while discussing control of rabies in New York City stated the position regarding vaccination against canine rabies thus: "Unfortunately evidence concerning the value of available vaccines is conflicting, indecisive and unsatisfactory".

The whole question regarding rabies vaccine in use for man and for animals remained obscure because of the lack of a suitable biological test to assay the potency of the various vaccines available. WEBSTER (1939) developed a mouse potency test to assay antirabic vaccines. This was modified and standardised by HABEL (1940). In India, Rao, S.R. and Dogra, J.R. (1948) reported results obtained with this test. Working with Haffkine Institute inbred white mice, this test gave very satisfactory results. These circumstances lead to the development of a method of preparation of an anti-rabic vaccine for animals which has given a very satisfactory protection in mice and dogs with *one injection*.

Materials and Method

Umeno's vaccine, it may be recalled, was a rabbit-brain phenolised vaccine incubated at 20°C. for two weeks. In our work, for economic reasons, rabbit-brain was substituted by sheep-brain, the sheep being economic, susceptible to fixed virus Rabies and satisfactory in every way. The vaccine was prepared as under.—

The Paris strain fixed virus used for routine manufacture of the 5-per-cent Semple's sheep brain vaccine for human use was used. On appearance of signs of paralysis (5-9 days) the sheep was decapitated, brain dissected and to every 100 gm. of brain tissues 100 c.c. of saline with 2.00 per cent carbolic was added and incubated at 37°C for 24 hours. Next day the emulsion was filtered through 32 gauge copper gauze and mixed with 200 c.c. of saline to make 25 per cent brain tissue emulsion with a final carbolic content of 0.5 per cent. The vaccine was then kept in the cold at 3 to 5°C. until required for use. Sterility was tested before and after decanting.

The mouse potency test advocated by HABEL was used employing Haffkine Institute inbred white mice about four weeks old weighing 16-18 gm. About 40 mice were used in each experiment. The canine vaccine was given in one dose of 0.3 c.c. after diluting it 1 in 10. All injections of vaccine were given intraperitoneally and the test virus challenge dose intracerebrally. The test virus was prepared by one passage of rabbit brain Paris strain fixed virus through the white mouse. The animals were observed for 21 days after the test virus infection and all those showing signs of paralysis were counted as deaths from rabies. M. L. D. protection of vaccine was calculated according to method of REED and MUENCH (1937).

The efficacy of this vaccine was also tested in dogs. Stray dogs of non-descript breed obtained from the Bombay Municipal Lethal Chamber, 10 to 40 lbs. in weight, were quarantined, vaccinated subcutaneously in two places with 3 to 6 c.c. of the vaccine, and observed for signs of reaction. Paris strain fixed virus challenge infective dose was given intracranially and animals observed for appearance of signs of fixed virus rabies for 30 days.

Inactivation of Rabies Virus in Sheep Brain

It is essential to completely inactivate the virus contained in a given vaccine before it can be safely used. Several workers have made attempts to achieve this.

SEMPLE (1911) showed that in an 8 per cent rabbit-brain-emulsion the virus was "killed" with one per cent phenol at 37°C in 24 hours. UMEMO and DOI (1921) ensured inactivation of the virus in a 20 per cent rabbit-brain-phenolised-vaccine by incubating the vaccine at 20°C. or keeping it at room temperature (18 to 22°C) for two weeks. KONDO quoted by SCHLIGMAN (1925) working with a vaccine prepared from the brains of dogs managed to attenuate the virus by the addition of 0.5 per cent phenol and incubation at 37°C for three days. HABEL K. (1947) reported that one percent phenol at 37°C completely inactivates rabies virus emulsions of 5, 10 and 20 per cent after 3 to 12 hours' exposure, whereas one per cent chloroform at 4°C required 21 days' exposure to kill the virus in a 20 per cent emulsion. As far as irradiation as a means of inactivating the virus was concerned, it was a matter of exposure for less than a second.

Since, in India, sheep-brain emulsions and not rabbit-brain emulsions were used, it was necessary to ascertain whether one per cent phenol would inactivate a 25 per cent sheep-brain-emulsion and, if so, in what length of time. This was put to test on several occasions and it was found that it took 6 to 7 days to inactivate the "fixed virus" in a 25 per cent sheep brain emulsion even when the emulsion was incubated at 37°C for 24 hours—viability or otherwise of the virus being demonstrated by intracerebral inoculation of 1 in 10 dilution in saline of the 25 per cent canine vaccine and the mice being observed for 21 days.

It became apparent that the virus in a 25 per cent sheep brain emulsion could be inactivated with one per cent phenol when incubated at 37°C for 24 hours and kept in an air-conditioned room at 75°F for 7 days. It would then be absolutely and completely inactivated and thus be safe for use in animals.

Immunizing value of Canine Vaccine in mice

Several batches of this vaccine have been tested in mice, vaccination being affected by a single dose of 0.3 c.c. in mice weighing 16-18 gm. and

about 4 weeks old. M.L.D. protection value of different batches of canine vaccine are set out in Table I.

TABLE I

Showing immunizing value of a 25 per cent sheep-brain-phenolised canine vaccine given in a single dose of 0.3 c.c.

Serial Number	Batch Number	50 per cent end point of immunized mice.	M.L.D. of Test Virus	M.L.D. protection of vaccine.	
(1)	513 / 48	-3.38 10	-7.71 10	4.33 10	21,380
(2)	700 / 48	-2.50 10	-6.62 10	4.12 10	13,180
(3)	724 / 48	-2.75 10	-6.62 10	3.87 10	7,413
(4)	752 / 48	-3.66 10	-8 10	4.34 10	21,880
(5)	777 / 48	-3.85 10	-8 10	4.15 10	14,130

In our hands, Semple's vaccine has given an M.L.D. protection value to the order of 27,540 and 89, 130 (five different batches examined). The canine vaccine *with one dose inoculation* has given similar results, variations being due to the former being given in 6 doses whereas the latter in one dose although the total quantity of virus containing brain tissues given in both cases was the same, namely 1.5 c.c. of a 5 per cent emulsion diluted 1 in 10. It will be observed that M.L.D. protection value of the vaccine is considerably higher than the minimum standard laid down by Habel—namely 50 per cent protection against 1000 M.L.D. of virus.

Preliminary Experiments with Dogs

Having demonstrated a satisfactory immunizing value of this single dose canine vaccination in mice, it was considered necessary to try it in dogs to ascertain whether its administration caused any undesirable reactions as well as to see whether it gave any protection against an experimental "fixed virus" intracranial infection.

Three batches of dogs were, therefore, submitted to experimentation, each consisting of 9 animals. The dogs were of a non-descript breed obtained from the Bombay Municipal Lethal Chamber. They were quarantined to ensure freedom from rabies and other pathological conditions. The quantity of vaccine given depended upon the weight of the animals. Thus to dogs weighing between 10 and 30 lbs., 5 c.c. and

those above 30 lbs. 6 c.c. was administered. The injections were made subcutaneously in two places on the sides of the abdomen. Twenty eight days later the challenge infective dose consisting of 0.3 c.c. of 1 in 100 rabbit brain emulsion of Paris strain fixed virus was given intracranially half to three fourths of one inch lateral to the cranial ridge after trephining the parietal bone under ether anaesthetization. The animals were isolated into individual kennels and observed for signs of rabies for 30 days after the test virus challenge dose.

In the first experiment, 2 out of 3 controls, i.e. 66 per cent succumbed to fixed virus rabies and three out of six, i.e. 50 per cent of the vaccinated escaped rabies. The period between vaccination and challenge dose was only 14 days. This was extended to 28 days and a second experiment put up. 60 per cent of the vaccinated succumbed to fixed virus rabies and 66 per cent of the controls showed infection. It was, however, felt that the unsatisfactory results were due to the fact that the weight, age and breed of the dogs under experiment were not taken into consideration and that they were not uniform, and, therefore, in the last experiment, 3 to 6 months old pups of almost same weight were selected. The results are shown in Table II.

TABLE II

Showing protection of dogs with 25 percent phenolised sheep brain single dose canine vaccine against 0.3 c.c. of 1 in 100 rabbit brain fixed virus infection given intracranially 28 days after vaccination.
Vaccine Batch No. 752/48 (2½ months old).

Number	Weight	Vaccine	Results
1168	11½ lbs.	5 c.c.	0.3 c.c. Died 4th day—Not Rabies
1201	10½ lbs.	5 c.c.	0.3 c.c. Died—Strangulation
1202	10 lbs.	5 c.c.	0.3 c.c. ALIVE
1204	11 lbs.	5 c.c.	0.3 c.c. ALIVE
1205	10½ lbs.	5 c.c.	0.3 c.c. ALIVE
1206	10½ lbs.	5 c.c.	0.3 c.c. RABIES—19th day
1167	9½ lbs.	5 c.c.	0.3 c.c. RABIES—11th day
1169	9½ lbs.	5 c.c.	0.3 c.c. RABIES—8th day
1203	12 lbs.	5 c.c.	0.3 c.c. RABIES—8th day

Dog No. 1168 died on the 4th day after the test virus dose without any signs of rabies. The brain was removed and biologically tested in mice for presence of virus. It did not show presence of fixed virus. Dog

No. 1201 died of strangulation showing typical post-mortem signs, but no signs of rabies. The remaining three out of four dogs, it will be observed, completely escaped rabies infection. The control animals, on the other hand, showed a hundred per cent mortality. This protection afforded by a single dose of the canine vaccine is considered of a very high order.

The disappointing results of the first two experiments can be ascribed to the variety of breed, differences of weight and age of the dogs used. By taking young pups of 3 to 6 months of age, approximately the same weight, although not the same breed, the difficulties were mostly overcome.

In the 18 dogs and pups vaccinated in these three preliminary experiments no untoward reactions occurred. Since the virus is completely inactivated, the vaccine is considered completely harmless and may be given subcutaneously without any apprehensions of any kind. Further work is in hand regarding the optimum dose, the duration and extent of immunity and field trials to establish its efficacy under natural conditions. Umeno and Doi (1921) using a 20 per cent rabbit brain carbolised vaccine used a dose of 6 c.c. per 15 kg. For the present the dosage recommended is somewhat similar, i.e. for dogs weighing below 10 lbs. 3 c.c. (single dose), those weighing between 10 and 30 lbs. 5 c.c. (single dose) and those above 30 lbs. 6 c.c. (single dose).

The results of these experiments suggest the possibility of routine prophylactic vaccination not only of dogs but other domestic animals as well. Repeated periodic vaccination would help to develop a very high level of immunity amongst domestic animals to safeguard them from scourge of rabies which is endemic in most cities in India and which annually takes a big toll from amongst dogs and cattle in this country. In turn a very large number of women and children who come in contact with rabid animals have to submit to anti-rabic treatment. It is felt that if the canine population could be safeguarded against rabies there would be considerable saving to the loss at present suffered by the nation.

Conclusions

1. A twenty-five per cent phenolised sheep-brain inactivated rabies virus vaccine is described.
2. Vaccination with 5 to 6 c.c. of this vaccine subcutaneously into normal dogs caused no noticeable untoward reaction.
3. The immunity produced by a single dose vaccination showed a high degree of protection in mice against intracranial infection and compared favourably with the immunity produced by 6 dose vaccination with 5% Semple's vaccine. In dogs, within the limits of the experiments, it afforded protection against a severe intracranial infection with fixed

virus. Dogs of approximately same weight and age showed 75 per cent protection as against controls which showed 100 per cent mortality.

4. Coupled with proper quarantine measures, the vaccine is recommended for the control of rabies in dogs and other animals.

Acknowledgments

I wish to thank the Principal of the Veterinary College, Bombay, for his kind invitation to attend this meeting and to all of you for your patient hearing. I must also make a special mention of the assistance and cooperation given to me by Dr. K. R. S. Aiyar, G.B.V.C., Professor of Pathology, and the hospital authorities for the facilities to conduct the experiments on dogs.

REFERENCES

- BARNES, M. F., METCALFE, A. N., MARTINDALE, W. E. & LENZ, W. J. (1934) *J. Amer. Vet. Med. Assoc.*, 84 (New Series), 37, p. 740.
- CORWIN, G. E. (1924), *Amer. J. Pub. Health*, XIV, 8, p. 688.
- EICHHORN, A. & LYON, B. M., (1922), *J. Amer. Vet. Med. Assoc.* 61, (New Series), 14, p. 38.
- HABEL, K. (1940), *U.S.A. Public Health Rep.*, 55, p. 1473.
- Idem* (1947), *U.S.A. Public Health Rep.*, 62, p. 793.
- HATA, S. (1924), *J. of Immunology*, IX, p. 89.
- KELSER, R. A. (1930), *J. Amer. Vet. Med. Assoc.* 77, (New Series), 30, p. 595.
- OLESKN, R. (1935), *U.S.A. Public Health Rep.*, 50, p. 1087.
- REED, L. J., & MUENCH, H. (1937), *Amer. J. Hyg.*, 27, p. 493.
- SANJIVA RAO, R., & DOGRA, J. R. (1948), *Ind. J. Med. Res.*, 36, p. 271.
- SEMPLER, D., (1911), *Scientific Memoirs*, (New Series), 44, p. 1.
- SCHLIGMAN, A. S. (1925), *J. Amer. Vet. Med. Assoc.* (New Series), 21, p. 299.
- WEBSTER, L. T. (1939), *J. Exper. Med.*, 70, p. 87.
- UMENO, S., & DOI, Y. (1921), *Abst. J. Amer. Vet. Med. Assoc.* (New Series) 12(6), p. 775.

PANTING IN CATTLE * A Sequel to Foot-and-Mouth Disease

BY

F. C. MINETT,
Izatnagar, India.

Investigations on this condition were begun at the Indian Veterinary Research Institute in 1942, and the results so far obtained are presented in three papers.^{11 12} This paper gives a general account of the disease, particularly from the clinical aspect. Owing to the political situation, the work could not be continued as far as was originally intended.

Although panting is well known in India to many people who deal with cattle, and though it is commonly believed to be an after-effect of foot-and-mouth disease, its cause has not been established. It is known under various local names: in the south-east Punjab it is called *ghamra* or *ghamar*; in central and western Punjab as *ta* or *tao*; in Sind as *tapi* or *thapi*; in Hyderabad as *nakka rogam* (telugu).

Badly affected cattle are recognized by dyspnoea, a long or rough coat, and poor body condition. The respiratory change becomes obvious only in the summer. As the heat of the day increases, the animal becomes progressively dyspnoeic, even at rest in the shed, and may stand with head down and tongue extruded, panting like a dog and dribbling frothy saliva from the open mouth. At this time, the body temperature may register 104°F.; the pulse rate is accelerated. The animal has an anxious expression and is obviously in distress. If made to walk slowly in the sun, respiration becomes more rapid; as nightfall approaches, the panting slackens. The skin feels abnormally dry and inelastic, and the coat is rough and contains many long hairs as though the winter coat was not shed in the spring but continued to grow. This appearance of the coat makes the animal conspicuous in the herd. When sent out for grazing during the hot season, the affected animal seeks the shade or, if water is at hand, will stand or sit in it like a buffalo. This interference with grazing may contribute to the unthrifty appearance of animals and to the low milk yield. There seems to be no particular age or sex susceptibility, but European cattle in tropical countries are especially affected; in fact, some believe that indigenous cattle and buffaloes do not suffer from panting. As yet, no cure has been found and symptoms recur each summer. If the cattle are moved to the hills, they remain in apparent good health, but symptoms reappear if they are returned to the plains during the hot season. Apart from moving the animals to cooler surroundings, all that is attempted to keep them in production is restricting

exercise, clipping, douching the skin, and providing water for bathing. Quite obviously, the condition arises from a permanent physical defect of heat regulation which, as stated above, is thought to be a result of an attack of foot-and-mouth disease.

Literature

References are surprisingly few considering the importance of the condition. Giovanoli¹ mentions its occurrence in the Swiss Alps and the tendency of some affected animals to sit for hours with a doglike attitude to facilitate breathing. Kern² also writes of the disease in Switzerland and refers to observations on the subject by Horvath⁴ and by Laszlo⁵ in Hungary.

There are also indications of its occurrence in Germany and Austria as observed by Johnk,⁶ in France by Robert,¹⁴ in Italy by Nai,¹³ and in Sweden by Magnusson.⁹ A full account of the disease, as seen in Belgium, is given by Hamoir⁷ who terms it "cardiac asthma," and who refers to observations in Holland by Kuypers.⁷ Hamoir states that the symptoms affecting the respiratory organs and skin to be noticeable six to eight weeks after disappearance of the foot-and-mouth disease vesicles. The coat is not only long, coarse, and dry, but also dirty from accumulation of scurf. The accelerated respiration is quite superficial but not forced, and there is no cough. The breathlessness may be such as to bring on attacks of asphyxia which may cause the animal to fall down. The pulse is feeble and accelerated (60 or more per min) even at rest. Auscultation of the chest reveals an increased vesicular murmur suggesting pulmonary emphysema. The heart sounds are practically normal at rest but become arrhythmic or otherwise altered on exercise. If animals are well cared for, the heart action is likely to improve and they may return to useful work though retaining a rough coat. This is especially true of young animals; in many cases, however, they are slaughtered for economic reasons. Hamoir found postmortem changes, regarded by him as primary, in the walls of the heart, viz., foci of sclerosis perhaps originating as a periarteritis, disintegration of muscle fibers, and changes in the bundles of His. There was also pulmonary emphysema which, however, bore no relation to the degree of dyspnoea during life, and, in 1 case, sclerosis of the adrenal cortex. No changes in other endocrine glands are mentioned. In a discussion on Hamoir's communication, Lignières pointed out that the condition is quite well known in Argentina, where affected animals are referred to as *asoleados*, since they appear to be affected by the sun. In some years, a large proportion of animals are affected. Lignières mentions the rapid abatement of symptoms if the air temperature falls sharply, as after a shower. The condition is chronic, and as the animals grow older, the symptoms become increasingly severe every hot season. Lignières and Kuypers believe that foot-and-mouth immune serum, given early in the attack, may reduce the number of affected animals.

In India, the disease was recorded by Shah¹⁶ at Hissar, and the symptoms were ascribed to derangement of the thyroid gland. Stewart¹⁷ has urged the

*From the American Journal of Veterinary Research 1948, 113, 545-550.

importance of panting among grade Holstein-Friesian cattle at the military farms and the need for reducing losses.

Most of the authors mentioned above are of the view that the condition is one of the complications or sequelae of foot-and-mouth disease. Why the complication should appear only in particular animals is not clear; but, according to Giovanoli and Hamoir,¹¹² the complication does not necessarily follow unusually severe cases of that disease.

Panting in Animals on Military Farms

In 1942, with the assistance of Brigadier J.J.M. Soutar, a questionnaire was circulated to the military farms in various parts of India. Replies were received from North West Frontier Province (Bannu, Dera Ismail Khan), Punjab (Sialkot, Sargodha, Ferozpur, Shadipur, Lahore, Jullundur, Ambala,

TABLE I

Incidence of Panting in Cattle on the Military Farms.

Holstein—Friesian						Grade						Total European, and crossbred.	Indigenous
Indian	Imported	15/16 or higher	1/2	3/4	5/8	3/4	1/2	1/4	1/8				
Adults ...	20	24	71	451	713	253	613	205	10	2360	538		
Panters ...	5	7	13	64	63	21	28	4	0	205	14		
(% of 205) .	(2.4)	(3.4)	(6.3)	(31.2)	(30.7)	(10.2)	(13.7)	(2.0)	(0.0)				
Young stock .	26	13	125	353	317	84	99	57	3	1077	35		
Panters ...	2	0	21	36	14	9	1	0	0	83	0		
(% of 83)...	(2.4)	(0.0)	(25.3)	(43.4)	(16.9)	(10.8)	(1.2)	(0.0)	(0.0)				
Total adults and young stock ...	46	37	196	804	1030	337	712	262	13	3437	573		
Total pan- ters ...	7	7	34	100	77	30	29	4	0	288	14		
(% of 288) .	(2.4)	(2.4)	(11.8)	(34.7)	(26.7)	(10.4)	(10.1)	(1.4)	(0.0)	(8.4)	(2.4)		

Multan), Central Provinces (Jubbulpur), United Provinces (Agra, Muttra, Meerut, Lucknow, Cawnpore, Allahabad, Jhansi, Dehra Dun), Bombay, (Deolalia, Belgaum, Kirkee, Ahmednagar), and Hyderabad-Deccan (Secunderabad). Apart from Belgaum (2,550 ft.) and Dehra Dun (2,375 ft.), all are less than 2,000 ft. above sea level. At most places, the average maximum

temperature exceeds 100°F. The total rainfall varies greatly from farm to farm. In addition, information was obtained from the Imperial Agricultural Research Institute (Delhi) and from a few persons having special knowledge of the subject. A digest of the replies follows.

Incidence.—Totals are shown in table 1. On the military farms, apart from some indigenous stock, most of dairy cows are Holstein-Friesian crosses with Sahiwal, Sindhi, or Haryana; particularly the first two. No panters were reported from Belgaum, while those at Dehra Dun had been sent there from other farms.

Figures in brackets indicate the percentages of animals which were panters. Thus, out of a total of 3,437 European and crossbred stock, 288 (8.4%) were listed as panters and, of these, the great proportion were $\frac{3}{4}$, or higher, European-bred. Among 573 indigenous stock on these farms, only 14 (2.4%) were panters. Out of 12,363 buffaloes, including an unknown number of young stock, on the military farms, only 2 animals were described as panters.

Breed and Grade.—Opinion is in conformity with results in table 1, viz., that the disease is more frequent and more severe in European or crossbred cattle. It occurs more rarely in indigenous cattle. The point is made, however, that many high-grade cows show a rise in temperature and respiration rate in the hot weather but are not true panters. In the report from Sialkot, where many purebred Holstein-Friesians are kept, it is stated that generally all the stock pant when the weather is exceptionally hot, dry, and calm. Of indigenous breeds, the Shaiwal has greater susceptibility.

Age at which Panting appears.—Many instances are mentioned where the disease is said to have first appeared in adult life. There are also many more instances where animals as young as 4 or 5 months have panted. The opinion from Allahabad is definite that calves do not pant while on milk, i.e., up to about 6 months. After that, panting may develop gradually, but it is always less in animals under 1 year than in older ones. Further, it is stated to be most severe in animals ready for service at about 2 years of age. Incidentally, among adults, dry animals are less affected than those in milk and especially those giving a high yield. The opinion is expressed that the condition becomes more severe after calving.

Hereditary transmission.—The evidence is inconclusive. Sometimes the sire or dam is known to be a panter. In other cases, there are definite statements to the contrary; often no information can be obtained.

Breeding capacity, Milk yield, and Systemic changes.—There is no adverse effect on breeding capacity, though calves from panters may be weak, nor does it cause abortion. As to the milk yield, no conclusive information has been obtained. All stock show a decline in milk yield during the hot months

and, as would be expected, this is exaggerated in panthers. The milk yield of panthers increases in the cool season. It is not clear whether the yield of animals which become panthers after an attack of foot-and-mouth disease is really lower than in animals which pass through an attack without becoming panthers. On the other hand, it is known that, at the time of an attack of foot-and-mouth disease, secretion may cease altogether and not reappear in the current lactation.

It is agreed that the body temperature in panthers is relatively high during the warmer part of the day in the hot season. This is accompanied by a rise to 80 or 100 in respiration rate and a rise in pulse rate. Bad panthers are said to show poor appetite during the hot season, especially during the warmer part of the day; but some say that even severe cases may continue to feed well. Less affected cases appear to feed and ruminate normally. Frequent mention is made of the rough staring coat containing long hairs. Panthers are often restless during the heat and have a staring, anxious, expression. Symptoms are more severe in dark-coated animals. Panthers consume excessive amounts of water and seek shade; they also seek to lie in mud or water. The condition is usually not severe enough to cause death, though a few cases of death from heat exhaustion are mentioned.

Relation to weather.—The condition is definitely related to high temperature, which appears to be the main factor. Excessive humidity accentuates the condition.

Relation to Foot-and-Mouth Disease.—Opinion is divided. A number of reliable observers have cited instances where, especially in high-grade animals, the onset of panting has followed an outbreak of foot-and-mouth disease. At Allahabad, it was believed that panting in the hot season generally follows foot-and-mouth disease but is simply due to debility following an attack of this disease in the previous cold season. On the other hand, there are numerous cases where panting has developed in animals having no record of foot-and-mouth disease. The question will be further considered in the discussion.

Natural recovery, Remedial measures.—The consensus is that there is no permanent natural recovery. There is temporary recovery with the onset of cold weather and some alleviation when the rains appear. As a preventive measure, back-crossing with indigenous stock is recommended. In developed cases, attempts should be made to keep the body cool; clipping and frequent hosing are useful measures, and where possible, cattle should be transferred to the hills during the hot season. Calving should be planned for the end of the hot season. The skin and coat can be restored by massage and grooming, but attempts to revive milk production have not been successful. Severe cases should be sacrificed.

Experimental Observations and Pathology

In order to make a close study of the condition, a number of cows reputed to be panthers, as well as some normal controls, were moved to the Institute,

kept for approximately two years, and then slaughtered for further examination. An account of this work is recorded in the papers by Minett¹¹ and Mullick.¹² During life, clinical examination was made from time to time (pulse, respiration, body weight, etc.), and the effect of mild exercise was noted. Blood and urine samples were taken for biochemical work, and after death particular attention was paid to certain of the endocrine glands. It was found that the panting condition varied among individuals and that a distinction had to be drawn between true panthers and animals which ordinarily feel the heat more than others of the same breed. During the hot damp days of the monsoon season, panthers show extreme distress and high respiration rate.

Panthers were found to be anemic, to have a lower alkali reserve than controls, and higher values for blood lactic acid and inorganic phosphorus. They showed a higher excretion of urine of relatively low specific gravity, and a lower output of urinary nitrogen and chlorine. They consumed less food and had lower food utilization than control cattle.

Definite lesions were found in the thyroid glands. These were reduced in size and the large colloid-distended vesicles of the normal, resting thyroid were replaced by small vesicles lined by somewhat cuboidal cells and containing little colloid. The reduced size of the gland is regarded as an environmental adaptation, but since the heat production of panthers is higher than that of controls, it seems that the panther's thyroid is still too active for the animal's needs. No distinct lesions were seen in the pituitary glands of panthers, but the chance that the fundamental defect lies in the Pituitary gland should be noted.

In the matter of treatment, very little work has been possible. One very bad panther was put on iron copper mixture, the daily dose of 1 fluid ounce containing 3.0 gr. FeSO₄ and 0.3 gr. CuSO₄. In addition, a daily ration of 6 lb. of green guinea-grass was fed. After one week, the iron mixture was increased 3.5 times. A month of this treatment had no effect on the general condition. After an interval of three weeks without treatment, this animal was given for one month 1 oz. daily of sodium bicarbonate in the feed, but again without obvious favourable effect.

Discussion

There seems no doubt that the pathologic condition, commonly known as panting, is far more widespread than might appear from the relatively scanty references in the literature. As mentioned above, it has certainly been recorded in a number of European countries, viz., Belgium, Holland, Sweden, Switzerland, Italy, Hungary, and probably also in Austria and Germany. Its occurrence in South America (Argentina) is also definite, but it is surprising that no references to it have been seen in the abstracts of the various administrative reports of countries of Africa. There is almost universal agreement that the condition is a sequel of foot-and-mouth disease; the fact that

the relation between cause and effect is not always evident is no solid argument to the contrary. In India, for instance, the primary affection may occur during the winter and well-marked symptoms of panting may appear only in part of the stock during the following hot weather. Slight attacks may escape notice or not be recorded. In connection with this matter, I have tried to ascertain whether panting has been observed in the United States and Australia, two countries which are free from foot-and-mouth disease. In regard to Australia, Ma. Max Henry³ writes: "All the men with whom I have made contact express the opinion that such a syndrome as described by you in connection with a condition known as 'panting disease' has not been observed in cattle in the Northern Territory or north of Western Australia. You will understand that some of the symptoms referred to may be seen when travel-weary cattle are moving fast in the hot weather, when an outbreak of pleuropneumonia occurs, and when toward the end of the dry season there is a general condition of emaciation, with rough staring coat." Dr. B.T. Simms, chief of the Bureau of Animal Industry in the United States, has sent the following notes: Dr. H. Schmidt of the Texas Agricultural Experiment Station points out that the symptoms of panting, as outlined by me, are identical with those seen in cattle suffering from vitamin A deficiency. He calls attention to his published article on the subject.¹⁹ Dr. Schmidt does not wish to infer that panting in cattle is due to vitamin A deficiency but merely to indicate that the symptoms in the two conditions are similar. No such symptoms have been observed by him in any other condition. Dr. C. C. Hastings of Williamsville, Ill., also points out the similarity between panting and vitamin A deficiency. Dr. Simms states that, apart from these two references, no information has been received indicating that panting, as seen in India, exists in the United States.

Assuming, therefore, that panting is a complication of foot-and-mouth disease, the question of just why it follows some cases and not others is not clear, but one is faced with a similar problem in other diseases, *e.g.* rheumatic fever following streptococcus infections in man. Cases of panting certainly vary in their severity, and it is easy to understand that cases which are obvious in hot countries might easily escape notice in temperate ones. Hamoir's observations suggest that, after some outbreaks of foot-and-mouth disease, panthers are especially liable to appear; this is perhaps to be explained by special but hitherto undefined tissue affinities of strains of foot-and-mouth virus or perhaps, more likely, by their differing values as antigens.

A further point to be recognized is that cattle, like other livestock, differ in their resistance to heat. A distinction has to be drawn between individuals whose heat tolerance is relatively low and whose respiration rate, in consequence, has to be increased in order to promote heat loss and those individuals, which are the subject of this paper, whose inability to support a hot environment is pathologic and appears to arise from some more fundamental defect. The failure to make this distinction may be another reason why the

relationship to foot-and-mouth disease is not always clear. The former condition may be simply due to production of thyrotropic hormone in excess of the animal's needs; just as, for instance, the pituitary glands of dairy cows produce more of this hormone than do those of beef cattle, while cows in milk are less tolerant of heat than dry cows for the same reason. In panthers, the production of thyrotropic hormone, though reduced in total amount, may still be relatively higher than the animal's needs, especially during hot weather. There are perhaps two factors concerned in panting—chronic anemia and a defect in the pituitary-thyroid-adrenal mechanism, both factors owing their existence to the virus of foot-and-mouth disease.

Summary

(1) A description is given of the pathologic condition, herein called panting, which, there is strong reason to believe, is sometimes a sequel to foot-and-mouth disease in cattle.

(2) The condition is characterized by anemia and is most severe in cattle in hot countries. Affected animals have a long, rough coat. There is evidently a more or less permanent physical failure of heat regulation, due to defective functioning of the endocrine glands.

(3) Among crossbred European cattle in India, the condition, though not usually fatal, is a source of greatly reduced productivity. It has also been described in other countries where foot-and-mouth disease is common, even in countries where the prevailing climate is temperate.

(4) A questionnaire addressed to the military farms in India revealed that out of 3,437 crossbred cattle, 288 (8.4%) were classed as panthers, but the proportion is three or four times this number in animals of three-quarters or higher grade. Of 573 adults of indigenous breed, only 14 (2.4%) were said to be panthers. It is questionable if the condition exists in buffaloes.

REFERENCES*

- *Glovanoli, G.: Die Nachkrankheiten der Blasenseuche. Schweizer Arch. f. Tierheilk., 57, (1915): 382.
- *Hamoir, J.: L'asthme cardiaque postaphteux. Bull. Soc. Cent. Med. Vet., 74, (1921): 409.
- *Henry, Max: Personal communication.
- *Horvath, A.: Dampfigkeit nach dem Überstehen der Maul-und-Klauenseuche. Cited by Kern, *loc. cit.*
- *Johnk, M.: Über Nachkrankheiten der Maul-und-Klauenseuche. Tierarzts. Rundschau., 28, (1922): 683.
- *Kern, H.: Untersuchungen über die Folgen der Maul-und-Klauenseuche. Schweizer Arch. f. Tierheilk., 63, (1921): 505.

*Owing to insurmountable difficulties in India, Dr. Minett was unable to complete his references in accordance with the style of the Journal.

- ⁷Kuypers, K. R.: Cited by Kern, *loc. cit.*
- ⁸Laszlo, S.: Nachkrankheiten im Gefolge der Maul-und-Klauenseuche, Cited by Kern, *loc. cit.*
- ⁹Magnusson, H.: Skand. Vet. Tidsske., 29, (1939): 1155, Abs. in Vet. Bull., 11, (1941): 89.
- ¹⁰Magnusson, H.: Bull. Office Internat. des Epizooties, 19, (1939): 413. (Original not seen.)
- ¹¹Minett, F. C.: Panting in Cattle—A Sequel to Foot-and-Mouth Disease. 1. Experimental Observations and Pathology. Am. J. Vet. Res. In press.
- ¹²Mullick, D. N.: Panting in Cattle—A Sequel to Foot-and-Mouth Disease. 1. Biochemical Observations. Am. J. Vet. Res. In press.
- ¹³Nai, D. D.: Una particolare lesione della iponsi nella vacca pelosa. Clin. Vet. Milano, 59, (1936): 355. Abs. in Vet. Bull., 7, (1937): 628.
- ¹⁴Robert, M.: Rev. Vet. 75, (1923): 290. Abs. in Trop. Vet. Bull., 11, 107. (Original not seen.)
- ¹⁵Schmidt, H.: Vitamin A Deficiencies in Ruminants. Am. J. Vet. Res., 2, (1941): 373.
- ¹⁶Shah, S. M. A.: Ghamra and Its Treatment at the Government Cattle Farm, Hissar. Punjab Vet. J., (Aug. 1948).
- ¹⁷Stewart, C. M.: J. Royal Army Vet. Corps, 13, (1942): 117.

SYSTEMIC ALKALINIZATION WITH SODIUM BICARBONATE IN THE TREATMENT OF COLD OF HORSES *

BY

ARCADIO C. GONZAGA, D.V.M., Ph.D.

*Assistant Professor and Acting Head Department of Physiology and
Pharmacology, College of Veterinary Medicine, University of the
Philippines, Quezon City*

Cold is a disease common among horses in the Philippines which is usually encountered in practice. While some cases may recover without treatment, others may lead to more serious affections; hence, the general advisability of instituting therapeutic interference once the disease is observed. As Udall (2) has aptly stated "Colds should not be lightly judged", as they may present various implications and wind up in grave complications.

Heretofore, we have been treating cold of horses with oral doses of ammonium chloride, antiseptic nasal irrigation, inhalation of medicated

* Read before the 26th Annual Convention of the Philippine Veterinary Medical Association April 23, 1949.

steam, and application of stimulating liniments on the throat in cases in which cough is concomitant.

Hixson (1), adhering to the hypothesis that in influenzal types of disease there is acidosis arising from constant disturbance of the acid-base balance in the body, treated over 4,500 cases of bovine shipping fever with sodium bicarbonate as the chief therapeutic agent. With this treatment, he was able to reduce the mortality from the maximum rate of 20 per cent to less than 1 per cent. Taking a lead from these encouraging results, the writer has thought it wise and worthwhile to try this same treatment on cold of horses, basing on the same accepted theory that in cold, an influenzal type of disorder, there is also acidosis. In so far as he is aware, no work of this kind on horses has, so far, been done and reported.

It is, therefore, the object of the present paper to record observations on the treatment of cold of horses by systemic alkalization with sodium bicarbonate,

The observations were conducted in the City of Manila and suburbs during the enemy occupation

Materials and Methods

The present study was made on fourteen horses suffering from different degrees and duration of cold. Of these nine were males, and five were females; two were grades kept for the turf, while the rest were native carretela ponies. Their heights ranged from 48 to 58 inches.

Freshly prepared 8 per cent filtered solution of sodium bicarbonate (U.S.P.) in sterile distilled water was used as the chief or only treatment. This was administered slowly and intravenously (per jugular vein) by gravity method, in doses ranging from 200 to 300 c.c. When two or more injections were required as judged from the response of the subjects, an interval of two days was allowed between each administration.

The relevant facts in the records of each individual case are given hereunder:—

Case No. 1.—Male; 49 inches high; 4½ years old; sick for 2 weeks; mucous bilateral nasal discharge; occasional cough. Cleansing of the nostrils with 2 per cent creolin solution; given 200 c.c. of the 8 per cent sodium bicarbonate solution. Cured in 3 days.

Case No. 2.—Male; 48 inches high; 3 years old; sick for 1 week; serous nasal discharge. One dose of 200 c.c. of the sodium bicarbonate solution cured the condition in 2 days.

Case No. 3.—Female; 48 inches high; 6 years old; sick for 4 days. Symptoms, treatment and results, the same as those of Case No. 2.

- Case No. 4.**—Male; 50 inches high; 8 years old; sick for two weeks, mucopurulent, bilateral nasal discharge; occasional dry cough; hissing nasal sound on respiration; slight dyspnoea; poor appetite. Nasal irrigation with two percent creolin solution; given 2 injections of 200 c.c. each of the sodium bicarbonate solution at two-days interval; cough, nasal sound and dyspnea gone, and nasal discharge greatly diminished 2 days after the first dose; case cured 1 day after the second injection.
- Case No. 5.**—Male; 49 inches high; 5 years old; sick for 1 week; mucous nasal discharge. One injection of 250 c.c. of the sodium bicarbonate solution cured the condition in 2 days.
- Case No. 6.**—Male; 49 inches high; 10 years old; sick for two weeks; mucous nasal discharge. Given 300 c.c. of the sodium bicarbonate solution. Cured in 3 days.
- Case No. 7.**—Female; 50 inches high; 8 years old; sick for 5 days. Symptoms, treatment and results, the same as those of Case No. 2.
- Case No. 8.**—Male; 49 inches high; 7 years old; sick for 3 weeks. Rest of the data, the same as those of Case No. 6.
- Case No. 9.**—Race horse; grade; female; 54 inches high; 6½ years old; sick for 4 days; serous nasal discharge. Given 200 c.c. of the sodium bicarbonate solution twice at two-days interval; cured after the second injection.
- Case No. 10.**—Race horse; grade; male; 58 inches high; 3½ years old; sick for 3 days. Rest of the data, the same as those of Case No. 9 except that the dose given was 250 c.c.
- Case No. 11.**—Male; 51 inches high; 7 years old; sick for 1 week; serous nasal discharge. Cured after 3 injections of 200 c.c. each of the sodium bicarbonate solution given at two-days interval.
- Case No. 12.**—Female; 49 inches high; 8 years old; sick for 1 week; mucous nasal discharge. Nasal cleansing with creolin solution; cured in 2 days after the administration of 300 c.c. of the sodium bicarbonate solution.
- Case No. 13.**—Female; 50 inches high; 9 years old; sick for 8 days; serous nasal discharge. Cured in 3 days after the administration of 250 c.c. of the sodium bicarbonate solution.
- Case No. 14.**—Male; 50 inches high; 6 years old; sick for 6 days; mucous nasal discharge. Nostrils cleansed with creolin solution; cured in 2 days after the administration of 250 c.c. of the sodium bicarbonate solution.

Discussion of Results

The results showed that the cases treated responded quite well with the systemic alkalization with 8 per cent sodium bicarbonate solution.

As previously stated, cold, like other influenzal types of disorder, is accompanied by a disturbance in the acid-base balance in the body with acidosis as a prominent sequel. It has been claimed (1) that in these conditions the acidosis "permits the facultative pathogens to exalt virulence", hence, the pathologic disorders become patent. Systemic alkalization with sodium bicarbonate corrected this underlying etiologic factor, resulting in the recovery of the cases treated.

Sodium bicarbonate is the chief alkali reserve in the body, "It neutralizes superfluous acids, replenishes depleted carbonates and permits normal buffer salts to remain in proper relation" (1).

It will be noted that those cases which received comparatively less amounts of the solution in proportion to their sizes required two or more injections before recovery was attained although the symptoms were less severe (see Cases Nos. 9, 10 and 11 as examples). Among the cases treated by Hixson, results were better and more prompt in those that were given much larger doses out of proportion to their sizes. Evidently, in the intravenous administration of 8 per cent sodium bicarbonate solution, the concentration found to be the best, the size of the animal is not much of a relevant factor to reckon with, indicating that this drug in such strength is practically harmless with a very wide latitude of safety. If cases Nos. 9, 10 and 11 were given larger doses, one administration would probably be enough to effect recovery, as they had only serous nasal discharge.

Cases Nos. 6, 8 and 12 were each given 300 c.c. purposely to see how this proportionately large dose would influence the course of the cold. Fortunately, only one administration was sufficient to cure the ailment with no harmful effects whatsoever observed. This finding supported Hixson's observations on the influence of proportionately larger doses.

The doses of 200 to 300 c.c. used in the present study were selected because these were the volumes we generally administered intravenously to our horses. In the light of the writer's observations and those of Hixson, it may be safe to presume that our horses can safely stand doses much larger than those used in this work. Lack of more cases prevented the writer from submitting this presumption to trial.

Hixson's doses ranged from 1 pint to 2 liters given intravenously to cattle ranging from 285 to 600 pounds of body-weight. These body-weights, however, played practically no role in the size of the doses used because there were instances in which he gave as much as 2 liters of the sodium bicarbonate solution to 285-pound calves with no untoward effects. On the other hand, the results were claimed to be better and more prompt in those cases so treated.

In the preparation of the solution, it is advised that it must not be heated, much less boiled, otherwise, carbon dioxide will be eliminated, a

carbonated sodium solution will result and, therefore, a solution no longer that of sodium bicarbonate will be the resulting preparation.

Summary and Conclusions

Observations on the treatment of cold of fourteen horses by systemic alkalization with 8 per cent sodium bicarbonate solution given intravenously are herein reported.

The cases treated responded quite well to the treatment. It appears that 8 per cent sodium bicarbonate solution given intravenously in doses ranging from 200 to 300 c.c. is a good treatment for cold of horses. Larger doses seem to give quicker results. Most cases were cured with only one administration of the solution.

Acknowledgment

The writer wishes to express his thanks to Dr. Jose B. Aranez for some data incorporated in this article, and to Dean Angel K. Gomez of the College of Veterinary Medicine, University of the Philippines, for encouragement and for going over the manuscript.

BIBLIOGRAPHY

1. HIXSON, R. W. Value of systemic alkalization in influenzal types of disease. *Journ. Amer. Vete. Med. Ass.* 81 (1932) 776-789.
2. UDALL, D. H. The Practice of Veterinary Medicine. Published by the author, Ithaca, New York, 1947, 751 pp.

RECENT ADVANCES IN SHEEP BREEDING METHODS IN THE UNITED STATES OF AMERICA

By

Lt. C. KRISHNA RAO, G.M.V.C., B.V.Sc., (MADRAS) M.S. (Calif)

[Received for publication 1st September 1948]

The western part of the United States of America is a vast range country with a wide variation in the climate, soil and rainfall. Extremes in climate vary from severe winter storms, with a drop in temperature to forty or more degrees below zero, to extremely dry condition, where water and feed are rather scarce, the summer temperatures often reaching well above 100°F. Between these two extremes there are all types of combinations of climate and feed conditions and these variations inevitably affect range sheep husbandry. There are approximately thirty-three million sheep in the western range areas, which constitutes two-thirds of the total sheep population of the United States (Nordby 1949). Most of these range sheep are of the fine-wooled type and are of Rambouillet

breed or have this blood to a varying degree. It is hardly possible to expect a single breed of sheep to thrive equally well under all these varying conditions. One obviously must appreciate the general variations in type that occur and which represent the ingenuity of the breeder in developing a type which thrives best under those conditions. They are results of wise selection for adaptation and any marked deviation from this type would end disastrously. Fine-wools that are located in areas where feed is plentiful are generally somewhat larger and produce more pounds of lamb and wool than those reared under less favourable conditions. Sheep that are reared in areas where feed is sparse tend to be smaller and generally produce a shorter and finer fibre. Usefulness in general determines the type and it is the ever-increasing urge for more and better lamb and wool production that leads the ranchman to evolve a type that brings him the greatest returns. If, in a fine-wool area, he is not able to satisfy that urge and economic need by finding enough large and rugged individuals, he often tries to satisfy this desire by injecting some crossbred influence.

The Rambouillet is a remarkable breed of sheep with a high power of adaptability to extremes in climate and feed conditions and also has a relatively long life. These two inherent qualities of this breed should be recognized as the basic requirements of any ranchman who is operating in areas, where there are alternately good and bad conditions, which often bring trouble to the large, cross-bred ewe

The Western Sheep Breeding Laboratory and The U. S. Sheep Experiment Station, Dubois, Idaho

The objective of any fundamental range sheep improvement programme must be clearly understood and defined. Where improvement of sheep for range conditions is the objective, it is of the utmost importance to carry out the experimental work under conditions which approximate those in which the sheep are expected to serve the ranchman. The management of the experimental flocks should likewise be representative of and applicable to conditions involving good management.

The combined facilities of the Western Sheep Breeding Laboratory and the U. S. Sheep Experiment Station, Dubois, Idaho involve approximately 28,000 acres of range land of the sagebrush type, 20,000 acres of summer range close to the Targhee National Forest, and Forest Reserve allotments for winter grazing. The main objectives of these institutions are the improvement of the already existing breeds that are generally adapted for ranch production and the formation of new breeds to fill in needs which cannot be filled so well by the established breeds. Improvement is measured on the basis of economic standards, paying the greatest attention to utility characteristics. The plant at headquarters is equipped with lambing facilities for about 1,000 sheep, shearing facilities and a modern laboratory which provides scope for

research in wool technology and reproductive physiology. The research personnel is within accessible distance from the experimental flocks (Nordby 1941). All useful characteristics, that in any way influence lamb and wool production under range conditions are closely integrated in the breeding programme. The following account briefly describes the progress made by the above institutions in evolving breeds and types of sheep which meet the western range conditions best and bring the ranchman the greatest returns.

Selection of Breeding Stock

Selection is the most powerful instrument in the hands of the breeder in moulding a type of animal which best suits his requirements. Selection brings about improvement of the breeding flock by retaining those animals with the most desirable characteristics and culling those with the least desirable ones. Breeding sheep should be produced and raised under conditions similar to those in which their offspring will be raised. The selection of high-producing rams is of the utmost importance in any type of sheep improvement programme. As in other classes of livestock, the sire is more than half the flock in sheep breeding. Increased production should be attempted by mating rams that come from high-producing stock and as far as possible by using proven sires.

Characteristics for Selection

I. *Open Face* :—Many range sheep, particularly those of Rambouillet breeding, have wool covering most of their face. This covering of wool on the face has usually been associated with wool covering on the legs, which may have some protective value. While the actual wool grown on the face and legs adds little if any value to the fleece, it has long been thought that covered faces are associated with a heavy weight of fleece. In recent years it has become apparent that heavy covering of wool on the face was not necessarily indicative of heavy fleece weight. Spencer et al (1921) published data on wool production showing that Rambouillet ewes with the barest faces had heavier fleece weights, both unscoured and scoured, than those with heavily covered faces. Range sheep producers in general favour the openfaced type. Sheep with heavily covered faces have to be clipped around the eyes at least two or three times during the year to prevent wool-blindness, and this means additional labour and expense. They are apt to be lost from the band and are unthrifty owing to partial starvation. Wool-blind lambs are timid in the feed lot and are not able to feed as well as the open-faced lambs. It is now generally agreed that an open face is desirable for most efficient lamb production in range sheep husbandry and that it is not inconsistent with heavy wool production. Terril (1941) found that Rambouillet ewes with open faces produced nearly 9 pounds more of lamb per year than those with covered faces and that the amount of clean wool produced was about equal for the two groups. It is then obvious that by the elimination of the face covering the range sheep breeder would have an animal which is more thrifty, less susceptible to disease and which

requires less attention. At the U. S. Sheep Experiment Station, Dubois, Idaho, attention was centred on the elimination of this undesirable face covering. Breeding stock was selected on the basis of the amount of face covering they had, paying due attention to other characteristics, as well. The lambs were scored for face covering soon after weaning as follows : (1) not covered beyond the poll, (2) covered to the eyes, (3) covered slightly below the eyes but open faced, (4) covered below the eyes but not entirely covered and subject to wool blindness, and (5) face almost or entirely covered and wool-blind. Fifteen scoring units were possible by assigning plus or minus values to lambs considered as being slightly above or below an even unit. (Terrill and Hazd 1946.)

II. *Neck Folds* :—Most of the sheep having Rambouillet blood have skin folds to a varying degree and this has for a long time been believed to be associated with greater wool production. Jones et al (1944) found that smooth Rambouillet flocks generally produce longer staple and more uniform fleeces than those with wrinkles. They also found that the weights of grease fleeces from the latter ewes were about one pound more than those from the former, while there was practically no difference in the weight of the clean wool from the two groups. Smooth sheep are more easily sheared, are less subject to fly trouble and produce more valuable skins than wrinkled sheep. There is often a discrimination by purchasers of feeder lambs against lambs with wrinkles or folds. It is now the general practice to select for smoothness in Rambouillet flocks in preference to folds of the skin.

At the U. S. Sheep Experiment Station, Dubois, Idaho, attempt has been made to breed a type of sheep without the skin folds. Breeding stock was carefully selected for the absence of the skin folds giving due attention to the other characters of economic importance. A system of scoring had been developed as follows: (1) no folds, (2) very few folds of small or moderate size, (3) folds of moderate size and number (4) heavy or large folds of moderate or large number, and (5) completely covered with heavy or large folds. As in the case of face covering fifteen scoring units were possible by assigning plus or minus values to lambs considered above or below an even unit. (Terrill and Hazel 1946).

Other characters :—In addition to the above characters selection was also directed towards other characters of economic importance as body weight, fleece weight, staple length, condition etc. and also for type.

Time of selection :—The first opportunity for selection on productive value comes at weaning age. Weaning weight, which measures the product to be marketed is probably the most important characteristic to be considered at this time. Staple length is important at weaning because it is the chief measure of fleece value at that age. An increase of one-half inch in staple length at weaning age (in Rambouillets) will result in an increase on the average of about one-half inch of staple length, and 1 pound of grease wool at

yearling age. Weaning weight and staple length together have been found to be very reliable in predicting yearling clean fleece weight. Mutton conformation and condition are considered in selection at weaning time as they are the chief measures of quality of lambs produced. Open face and smoothness should be emphasized in selecting weanling lambs for breeding purposes. Some change in face covering may occur between weaning and later ages but, in general, face covering at weanling age is highly representative of that at yearling age. Usually it is more economical to select as much as possible at weanling age. (Terrill 1946)

A second selection is made at *yearling age* at which time emphasis is in general placed on the same characteristics with the addition of fleece weight. Yearling traits may be somewhat more representative of breeding value than weanling traits. Approximately 25% of ram lambs are saved as prospective sires in the main lines of breeding at weanling age. At yearling age only about one half of these are reserved, the most promising of which are tested for potential service in the thirty main breeding lines. Finally, about 3% of the original number are used for one or more years as stud rams. A detailed laboratory examination of the fleece is done involving the estimation of the percentage of shrinkage, fineness and uniformity of fibre, examination for kemp and strength of fibre. The same examination of body fleece is repeated each year thereafter for all rams in the flock two years older. (Nordby 1943).

Progeny Tests:—After the initial selection at weaning age followed by further selection at yearling age, the prospective stud rams for the main breeding lines are now subjected to the most rigid test, the progeny test. Each of the selected rams is mated to a group of representative ewes for the purpose of determining his value as a sire. From twenty to thirty rams are tested in this way each year and approximately one-third of these qualify for trials in the main stud lines. Even though a ram is admitted to the main stud lines, his progeny are carefully examined each year. After a ram has been tentatively qualified as a stud ram, he retains that designation only as long as his annual progeny make him worthy of that designation. (Nordby 1943).

Testing rams for fertility:—All rams used for service are tested for the various semen characteristics to determine their potential fertility. These tests include the estimation of the sperm concentration, sperm-morphology, motility, etc. Such a procedure largely eliminates any sterile rams which cannot be detected until too late after incurring great loss from infertility.

Effect of the environment on the various traits:—Both induced and natural environmental factors operate to conceal genetic merit, thereby confusing the breeder and obstructing his efforts to select those animals having the greatest breeding value. In many cases, variations in environment can be eliminated or controlled, but, in others, only adjustment or correction is capable of placing animals on a comparable basis. Among some of the

environmental factors which interfere with the effectiveness of selection are sex, the age of dam, the type of birth, whether single or twin birth, and the degree of inbreeding. Correction or adjustment for measurable effects of environmental factors may increase the effectiveness of selection. These corrections will also be useful in many experimental studies where it is desirable to minimize the complication of environmental effects (Hazel and Terrill 1945, 1946 a, 1946 b; Terrill Sidwell and Hazel 1947.)

Work at the U. S. Sheep Experiment Station brought out the following important points on these environmental effects.

Weaning weight:—Rams were 83 pounds heavier than ewes, and single lambs were 9.2 pounds heavier than twin lambs. A difference of 2.5 pounds was found between singles and twins raised singly, which indicates that twinning is slightly detrimental to subsequent growth, even when post-natal conditions are otherwise similar. This may be due to smaller birth weight of twins. Inbreeding has a marked detrimental effect on weaning weight. Lambs from mature ewes were slightly heavier than those from younger ewes.

Length of staple:—Ewe lambs averaged 0.48 cm. more staple length than ram lambs. The causes of this difference were not understood. All of the environmental sources except the per cent of inbreeding had highly significant effect upon staple length but only the difference between the sexes, and possibly that between ages of dams, was sufficiently large to warrant adjustment.

Body type:—Ram lambs were scored slightly higher in type than ewe lambs. This difference may have resulted from a higher standard for ram lambs because of the more stringent selection which was practiced for rams than for ewes. Single lambs were given better type scores than twin lambs raised singly which in turn excelled twins raised as twins. Score for body type improved with age and became poorer with increased inbreeding.

Condition:—Differences due to sex, age of dam, and type of birth were highly significant for condition or degree of fatness. Twins were scored poorer than single lambs and this difference was large enough to require adjustment. Scores for condition improved with age at weaning and became poorer with increased inbreeding.

Face covering:—The ram lambs were scored as having considerably more covered faces than ewe lambs. This difference was much less marked in breeds having more open faces than Ramouillets. Although the effects of sex, age of dam, and years were statistically significant, only the sex difference seems large enough to warrant adjustment.

Neck Folds:—The greater development of neck folds in ram lambs, single lambs and lambs from mature ewes than in ewe lambs, twin lambs and lambs from two year-old ewes suggests that the development of folds is strongly

influenced by those factors which are favourable to growth in lambs. Carter (1941) found that the development of neck and body folds in Merinos was reduced on a low plane of nutrition and augmented on a high plane.

Some of the traits were influenced much more by the environmental factors studied than were others. It is particularly noticeable that most of the factors had relatively greater effect upon the characters which are measured by an objective or quantitative standard (grease fleece weight, body weight, staple length, and clean fleece weight), than those which are evaluated by subjective scores (condition, neck folds, body type, and face covering). The effects of age of dam, type of birth and differences in age were generally in the same direction on yearlings as on weanling lambs but they were relatively smaller on yearlings. Phillips and Dawson (1940) observed that lambs handicapped by birth factors with adverse effects upon growth rate tended to overcome those handicaps by the time they reached yearling age and this was confirmed by the work of Hazel and Terrill (1946). Phillips and Dawson (1940) proposed three methods whereby differences due to sex, type of birth, and time of birth could be at least partly overcome in selecting breeding animals: (1) separate the lambs into groups according to sex, type of birth and time of birth, (2) make selections at a standard age, using adjustments for sex and birth factors, and (3) postpone selection until a later age when differences are more nearly equalized.

Progress in Sheep Breeding Work at the U. S. Sheep Experiment Station

Progress in selection for smoothness in Rambouillets:—Continued progress towards the elimination of skin folds was noticed. The trend toward the elimination of neck folds since the establishment of the laboratory is shown in the following table:

Year weaned	Average neck fold score	% lambs which have				
		Practically no folds	Trace of folds	Moderately heavy folds	Fairly heavy folds	Heavy folds
1938	2.35	20	41	27	10	2
1939	1.94	43	32	20	4	1
1940	2.37	21	38	29	9	3
1941	2.07	34	38	22	5	1
1942	1.60	56	28	12	3	1
1943	1.83	48	35	13	3	1
1944	1.57	69	18	9	3	1
1945	1.40	77	18	4	1	0
1946	1.23	82	16	2	0.1	0.1

During the nine-year period the neck fold score has been reduced from about 2 to slightly smoother than 1. The proportion of practically smooth lambs increased from 20 to 80 percent while lambs with moderate to heavy folds have decreased from 39 to 2 percent. Further progress towards elimination of skin folds can be expected to be slow, but this is not important as the bulk of lambs are already free from folds.

Progress in Selection for Open Face in Rambouillets

Progress in increasing the incidence of open face in the Rambouillet flock is shown below:

Year weaned	Average face Covering Score	% lambs which have		
		Open faces	Partially covered faces	Covered faces
1938	4.15	14	58	28
1939	4.28	11	50	39
1940	4.45	11	34	55
1941	4.37	11	40	49
1942	4.26	17	40	49
1943	4.45	8	36	56
1944	4.3	11	44	45
1945	4.54	6	40	54
1946	4.02	25	48	27

It appears that the open face tends to dominate over the covered face. Progress in the elimination of face covering was less marked and in recent years more emphasis is being placed on selection for open faces.

Progress in Selection for Greater Fleece Weight

In the following table are enumerated the grease fleece weights, clean fleece weights, and the percentage clean yield by grade for four years from 1942-45 for the stud and reserve rams two years of age or older (Pohle 1948).

Grade	Year	Grease Fleece Weight	Clean yield %	Clean Fleece Weight (lbs.)
Fine staple combing	1942	14.4	44.3	6.4
	1943	16.1	45.2	7.3
	1944	16.5	45.7	7.5
	1945	17.1	44.0	7.5
4-year average		15.9	44.8	7.1
$\frac{3}{4}$ blood combing	1942	15.0	46.4	7.0
	1943	16.7	44.2	7.4
	1944	16.9	49.3	8.3
	1945	18.1	44.3	8.0
4-year average		16.6	46.0	7.7
$\frac{1}{2}$ blood combing	1942	15.3	51.5	7.9
	1943	17.1	48.0	8.2
	1944	16.6	51.9	8.6
	1945	16.8	49.6	8.3
4-year average		16.3	50.5	8.2
Quarter blood combing	1942	16.4	53.2	8.7
	1943	17.6	53.6	9.3
	1944	18.2	53.4	9.7
	1945	18.9	50.2	9.5
4-year average		17.9	51.9	9.3
All grades and years		16.2	46.7	7.6

The practice of inbreeding and its effect on the various characteristics

The Rambouillets at the U.S. Sheep Experiment Station are divided into thirty inbred lines. These are not all subjected to the same intensity of inbreeding. The object of this inbreeding programme is to test the various lines for the purity of their inheritance for the various useful characters. A few lines of breeding that are under way have been organized for the purpose of intensifying special characteristics such as smoothness, open face, long staple etc. When these lines become sufficiently established in these characteristics, matings will be planned with other lines which may be deficient in these characters so that they can be transferred to them. It is also planned to cross various inbred lines to determine whether such a combination gives rise to increased vigour and more uniform breeding qualities. The crossing of inbred lines with unrelated proven rams had been tried with very encouraging results.

The effect of inbreeding on the various characteristics was determined both at weaning time as well as at yearling age. (Hezul and Terrill 1945, 1946a, 1946b.). In general, inbreeding had relatively greater detrimental effects on the mutton characters (body weight, body type and condition) than on fleece characters (staple length, grease fleece weight, and clean fleece weight.) The effect of inbreeding was fairly consistent for each age group. The effects of inbreeding on face covering and neck folds, were negligible, although the more inbred lambs tended to have slightly more covered faces. The effect of inbreeding was much more important in Targhees than in Columbias, the same characters as in Rambouillets being affected.

The percentage of inbreeding had a pronounced detrimental effect on the weaning weight but this was not as severe in yearlings.

BIBLIOGRAPHY

1. J. E. Nordby: Sheep Improvement for Range Production. *Idaho Forester*, Vol. 23, 1941.
2. Spencer, D. A., Hardv, J. L., and Brandon, M. J.: Factors that Influence Wool Production with Range Rambouillet Sheep. *U. S. Dept. Agr. Tech. Bul.* 85, 48 pp., 1928.
3. Terrill, C. E.: Face Covering in Range Sheep. *U. S. Dept. Agr., A, H. D.* No. 49, 9 pp. 1941.
4. Terrill, C. E. and L.N. Hazel.: Heritability of Face Covering and Neck Folds in Range Rambouillet Lambs as Evaluated by Scoring. *Journal of Animal Science*, 5:170-179, 1946.
5. Jones, J. M., Dameron, W. H., Davis, S. P., Warwick, B. L., and Patterson, R. E.: Influence of Age, Type and Fertility in Rambouillet Ewes on Freeness of Fibre, Fleece Weight, Staple Length and Body Weight. *Texas Agr. Exp. Sta. Bul.* 657, 35 pp., illus. 1944.
6. Terrill, C. E.: Range Sheep improvement through Selection. *National Wool Grower*, December, 1946.
7. Nordby, J. E.: Improving Rambouillet Sheep for Western Ranges. *National Wool Grower*, March, 1943.
8. Hazel, L. N. and Terrill, C. E.: Effects of Some Environmental Factors on Weanling Traits of Range Rambouillet Lambs. *Journal of Animal Science*, 331-341, 1945.
9. Hazel, L. N. and Terril, C. E.: Effects of some Environmental Factors on Fleece and Body Characteristics of Range Rambouillet Yearling Ewes. *Journal of Animal Science*, 4: 382-388, 1946a.
10. Hazel, L. N. and Terril, C. E.: Effects of Some Environmental Factors on Weanling Traits of Range Columbia, Corriedale and Targhee Lambs. *Journal of Animal Science*, 5: 318-325, 1946b.
11. Terril, C. E., Sidwell, G. M., and Hazel, L. N.: Effects of Some Environmental Factors on Yearling Traits of Columbia and Targhee Ewes. *Journal of Animal Science*, 6: 115-122, 1947.
12. Carter, H. B.: The Influence of Plane of nutrition on the Growth of Skin in the Merino. *Austral. Inst. Agr. Sc. Jour.*, 3: 101-102, 1941.
13. Phillips, R. W. and Dawson, W. M.: Some Factors affecting Survival, Growth and Selection of Lambs. *U.S.D.A. Circular No. 538*, 17 pp. 1940.
14. Pohle, E. M.: High producing Rams important. *National Wool Grower*, January, 1948.
15. Annual Reports of The Western Sheep Breeding Laboratory and The U. S. Sheep Experiment Station, Dubois. *Idaho*.

INDIAN HIDES & SKINS AND VETERINARY SCIENCE

By

B.N. SONI and GIAN SINGH,

Indian Veterinary Research Institute Mukteswar—Kumaon

[Received for publication on 8th June 1949]

The Indian raw hide and skin industry, like similar other industries in the country, has till very recently depended on the craftsmanship handed down from generation to generation. But, in the fast developing machine age and international economic competition, it has become essential that this industry is handled on scientific lines. The importance of this industry to our country is evident from the fact that India has the largest herds of cattle in the world—about 180,000,000 cows and oxen, 50,000,000 buffaloes, 46,000,000 sheep, 58,000,000 goats and 12,000,000 of other kinds, and also from her estimated production of hides and skins which is as much as 20,000,000 cow hides, 5,700,000 buffalo hides, 27,500,000 goat skins and 17,100,000 sheep skins, ranking the highest in the world. The nation's normal production of raw leather is estimated to be worth about Rs. 36 crores. In the year 1946-'47, 49,789 tons of raw and tanned hides and skins valued at Rs 267,996, 548, crores were exported to foreign countries from the British India. The national economy can well be judged from these figures.

As a result of the country's partition, approximately 1/6th of the bovine population and 1/8th of the goats and sheep are included in Pakistan area. The production of hides and skins is also reduced roughly in the same ratio. Besides this decrease, the prohibition of cattle slaughter in many parts of the Indian Dominion has further added to the shortage of hides and skins for the Indian tanneries. All these have created a serious problem for nation's needs of leather goods.

In attempting to solve this problem, almost the first thing to remember is that the development and improvement of this vast industry can be effected only if the production of raw hides and skins is based on sound scientific lines. Only then can we reduce the present huge wastage in this industry to a minimum. It is now an established fact that the livestock and their products are to be handled by the personnel of the Veterinary profession. As such, a major part is to be played by veterinarians in the production of healthy raw hides and skins. In order to save the live stock population and the damage done to hides and skins, both Mexican and U.S.A., Governments have allotted Rs. 140, 250,000/- to fight against "Foot and mouth" disease. U.S.A., is expected to spend more than Rs. 825,000,000/- to put down this disease within the next few years. This fact becomes all the more impressive when we know that "Foot and Mouth" disease is not a fatal disease to livestock, but it only causes debility, loss of milk, abortion in pregnant animals and physical inactivity. But the conditions in India are most discouraging. Even the

most fatal diseases of live stock are still unchecked. These diseases, besides causing immense losses to the livestock wealth of the nation, are responsible for heavy damage to the production of sound raw hides and skins.

It is only the application of veterinary science which can help in supplying wholesome raw hides and skins to the tanneries. At present there are 234 tanneries in India but there is no established institute which deals with the scientific research for production, flaying and curing of raw hides and skins. Some research work has been done at the Indian Veterinary Research Institute, Mukteswar, on the control measures against warble fly, Ticks and Mange Mites. Research is also being done for control of leather beetle, but the problem of improvement of raw hides and skins in India is so vast that much more efforts are needed on a national scale. The raw Indian hides and skins require still greater attention from international trade point of view. Complaints have been made to the Government of India by foreign countries against improper cure of Indian hides and skins. It is alleged that bitters—salts and other inferior salts—are used for this purpose which cause huge losses to the buyers and tanneries overseas. As hides and skins are important items in the export rate of the country, the Government of India are keen that all possible steps are taken to ensure proper cure of hides and skins particularly those meant for foreign markets. At present some experiments on laboratory scale are being carried out at the Indian Veterinary Research Institute in connection with curing of hides and skins.

Flaying of hides and skins also requires considerable attention and this should also be developed as a highly technical enterprise.

The whole problem of this important national industry can now be tackled mainly on the following lines with the double object of making up the deficiency in production and improvement in the quality of this commodity. Separate Central and Provincial Budgets should be allotted for carrying out necessary research and control measures with a view to improve this industry.

1. *Contagious diseases.*—The fighting of animal diseases is however, a vast problem, in which the question of national gain through the improvement of hides and skins must play a subsidiary though intrinsically important part. Fatal diseases like *Anthrax*, *Haemorrhagic septicaemia* and *black quarter* render the hides and skins unfit for use. Similarly *Rinderpest*, *Cow and Sheep Pox* and *Foot and Mouth Disease* rob the hides or the skins of their hide substance and thus impoverish them. These diseases also cause pock marks which greatly damage the pelts. Black quarter, ulcerative lymphangitis, and malignant tumours even cause holes in the hide substance and this proves a great menace to this industry. Hides and skins obtained from animals which have died of these diseases, show various defects

during and after tanning. To combat contagious diseases Indian Veterinary Research Institute has already shown the way. Numerous vaccines and sera are prepared in the Institute for the control of many fatal contagious diseases. Research is also being done to device prophylactic measures against diseases for which such products have not been produced as yet, such as "Foot and Mouth" disease. The use of good quality vaccine and sera at the proper time can stop the outbreak of these diseases.

2. *Warbles (Hypoderma lineatum)*.—Warbles cause heavy damage to the hides industry and often render the hide completely useless. At present a monetary loss of one and a half crores of rupees per annum is being incurred by the country on this account. Fortunately, however, this enormous loss need not be incurred hereafter if the Provincial Governments will give practical effect to the research work done at the Indian Veterinary Research Institute. As a result of the experiments done at the Institute and confirmed in the field, it can now be stated that if the provinces establish Seasonal tobacco-lime dressing stations and 'Singeing' organisations, they can eradicate the loss caused by the warbles and improve the hides and skin industry.

In this connection, it may be mentioned that research work on the life-history of *Hypoderma crossi* of goats is still to be taken in hand, in view of its importance in the goat breeding and goat skins industry in India.

3. *Ticks (Boophilus microplus) (Hyalomma aegyptium) and Mange Mites.*

Ticks damage the grain of the hides and skins and after tanning the finished leather shows numerous marks and abrasions thus reducing the tensile strength and value of tanned leather. The authors in their recent tours saw a heavy percentage of tanned leather damaged by ticks and mange mites. Work is being carried out at the Indian Veterinary Research Institute on the control of ticks and the results so far obtained show that "Gammexane powder" (D. 025) is quite effective for destroying ticks in all stages. Experiments with D. D. T., and Hexydan are also being carried out. These drugs are found to be effective against ticks in their adult and nymphal stages but not against engorged ones. But the major problem of finding out a cheap country drug for field use is still to be tackled and, once this is found out, the hides and skins industry will be saved from a huge financial loss. As regards control against Mange mites, work done at the Institute has shown that, Caustic Soda Sulphur dip is most effective against Mange Mites and it is advocated for use in the field.

4. Other factors which are responsible for adverse effects on the hides and skins industry, are ring worm, internal parasites, leather beetle (*Dermestes vulpinus*) hump sores, gangrene, acne, malignant tumours, actinomycosis, leprosy, maggot producing larvae (*Chrysomya*-

bezziana), melanosis and filariasis. Further, nutritional defects also are responsible for inferior quality hides and skins because poorly fed animals yield only thin and papery hides and skins which have no strength.

It is hoped that effective measures will be undertaken as regards defects mentioned above. These measures should be popularised on a national scale not only from the view point of the Indian Leather Industry, but also from the other multifarious advantages accruing from them to the livestock industry of the country.

5. *Scientific Flaying*.—At present the standard of flaying is very poor in India and it is responsible for considerable financial losses to this industry. The Annual production of hides in India is estimated to be 66 lakhs from slaughtered animals. Out of this, nearly one third, or 22 lakhs, are damaged due to bad flaying. Similarly 1912 lakhs hides are produced from "Fallen" animals and out of this one half or 95.6 lakhs are defective due to bad flaying resulting in a loss of about 70 lakhs of rupees in a year. Similarly a loss of about 7.5 lakhs is being incurred due to defective flaying of skins. Bad flaying causes butcher marks, cuts, flay marks, scores and holes which reduce the tensile strength of the leather and reduces its value. Some times bad flaying splits the hide and renders it unfit for tanning purposes. The adherence of extra flesh and tissues also cause considerable damage as the putrefaction starts from those very points. Flaying can be improved if the state starts flaying centres. Proper demonstration in improved flaying with latest implements is essential. Every flayer must be a licensed one. Improvement in city slaughter houses in India is also necessary for good flaying because the environments and facilities under which the flayer has to work have considerable influence on his efficiency. Similarly local bodies can have their men trained in flaying and such men known as "Master flayers" can arrange demonstration in the villages.

6. *Curing of Hides and skins*.—The Indian Hides Committee appointed by the Government of India has laid much stress on finding out the best "cure" for Indian Hides and Skins. The Indian Marketing report suggests that experiments should be done first on a laboratory scale for this purpose. The present Indian system of 'curing' is responsible for heavy financial losses, specially in our trade with foreign countries, as has already been pointed out above. Curing should be improved as a highly technical enterprise. By this process hides and skins are preserved and putrefaction, growth of bacteria, fungi and other chemical actions are checked. *Curing is one of the most important factors determining the grading and selection by the tanner.* In a tropical country like India the bacterial action, growth of fungi and general putrefaction start in raw hides and skins as soon as the animal dies or is slaughtered. The 'cure' should be such that it should not only check growth of bacteria but it should at the same time kill the bacteria already developed. Curing can be done by treating the raw hides

and skins either by antiseptics or by treating them with some dehydrators to remove the moisture to such an extent so as to inhibit the growth of bacteria. So far the best 'cure' is not found in India. Common salt and its varieties are generally used for this purpose but it has been proved that salt cure does not remove the entire possibilities of growth of bacteria, putrefaction and insect damage. In this connection, some laboratory experiments are in progress at the Indian Veterinary Research Institute, Mukteswar. The following cures are being tried:—

1. Carbolic lotion (from 2 to 10%).
2. Formaline lotion (from 1 to 5%).
3. Arsenication.
4. Common salt and its various types.
5. Alum.
6. Common salt and Alum equal parts.
7. Pure ordinary lime.
8. Common salt and lime, equal parts.
9. Mixture of Common salt and sodium carbonate equal parts.
10. Mixture of common salt and sodium sulphate equal parts.
11. "Septotan" and "Atlas S" (two 'cures' from England.)

Skins cured by carbolic lotion and formaline lotion did not show any sign of putrefaction, for a formaline-cure rendered the skins hard and wrinkled. Similarly skins treated with pure lime gave good results but the skins got hardened and showed several whitish spots on the flesh sides. Of the other cures, the mixture of sodium chloride and sodium sulphate as well as that of sodium chloride and lime gave quite satisfactory results and skins cured with them remained wholesome and fresh for a month.

Hides treated with Septotan showed signs of putrefaction (loosening of hair and putrid smell) on the third day after their cure. But these results cannot yet be generalised because of vast climatic differences between Mukteswar (altitude 7,500 feet) and other parts of India. More over the cost of such cures is still a bit too high for conditions prevailing in our country.

In addition to above chemical cures, mechanical cures by drying hides and skins by frame method (as practiced in Java) has also been tried here. It has been proved that frame drying gives much better results. The hides and skins so dried have no wrinkles and no putrefactive scars. With a nominal initial cost, the dealer can get ever-lasting benefit in the price and quality of its hides and skins. However, still greater efforts are yet needed to solve this problem of finding a cheap and effective cure for Indian hides and skins especially those meant for export.

GENITAL HYPOPLASIA IN THE JUVENILE FEMALE PIGEON DUE TO ANDROGENIC TREATMENT

BY

AMIYA B. KAR, M.Sc., Ph.D. (Edin.)
Department of Biology, St. Xavier's College,
University of Calcutta.

[Received for publication 10th June 1949.]

With four figures.

The Problem

It has been adequately demonstrated that the androgenic hormones are capable of eliciting marked histo-physiological changes in the mammalian reproductive system. Unfortunately, comparable studies with birds have been meagre. However, the action of various testoid preparations on the female genitalia of birds has been studied in the English sparrow (Ringo, 1943), the night-heron (Noble and Wurm, 1940), the fowl (Herrick, 1944; and Kar, 1947a), the sparrow hawk (Nelson and Stabler, 1940), and the Indian spotted munia (Kar, 1948).

The present report has been concerned with an attempt to study the effects of an androgen, testosterone propionate on the female genital system of the juvenile pigeon.

Experimental Procedure

Female pigeons, 80 days old were involved in this study. The birds were housed in cages and maintained under uniform husbandry conditions throughout the duration of the experimental period. The initial body weight of each bird was taken at the commencement of the experiment and the final weight was recorded on the day of autopsy.

The testoid, testosterone propionate in sesame oil was administered intramuscularly. The daily injections (1.2 mgm.) were made into the breast muscles and continued for a period of 40 days (March 8, 1949 to April 16, 1949). The site of injection was altered from day to day on the right and left sides of the breast. Uninjected birds served as the controls.

All the birds were autopsied on the day following the last injection. The ovary and the oviduct were carefully dissected out, weighed to the nearest mgm., and finally fixed in alcoholic Bouin's fluid for histological study. The sections were prepared by the paraffin method and stained with Delafield's hematoxylin followed by alcoholic eosin.

Results

Macroscopic observations:—Gross examinations at autopsy revealed pronounced inhibition of the genitalia of the androgen recipients. A perusal of table I will also indicate that the absolute and relative weights of the hormone treated ovary and oviduct were significantly lesser as compared to those of the untreated ovary and the oviduct.

TABLE I

Oviducal and ovarian weights in control and androgen treated pigeons.

	Number of birds	Oviducal weight		Ovarian weight		Body weight at autopsy Gm.
		Absolute	Relative‡	Absolute	Relative	
		Mgm.	Per cent	Mgm.	Per cent	
Untreated controls	8	502.5 ± 1.2	.0248	270.5 ± 1.2*	.0133	202.2 ± 2.5
Androgen treated	10	260.2 ± 0.5	.0118	101.1 ± 0.6	.0045	220.5 ± 1.8

*Standard error of the mean.

‡Organ weight expressed as percentage of body weight.

The oviduct of the experimental birds was a pale and non-tortuous structure. The oviducal ligaments were extremely inconspicuous, and the muscular bundles characteristic of the ligaments were almost indistinguishable. In contrast to these conditions, the oviduct of controls was extremely hyperemic and presented a convoluted appearance. The ligaments of the oviduct were much larger in size and had quite thick muscular bundles.

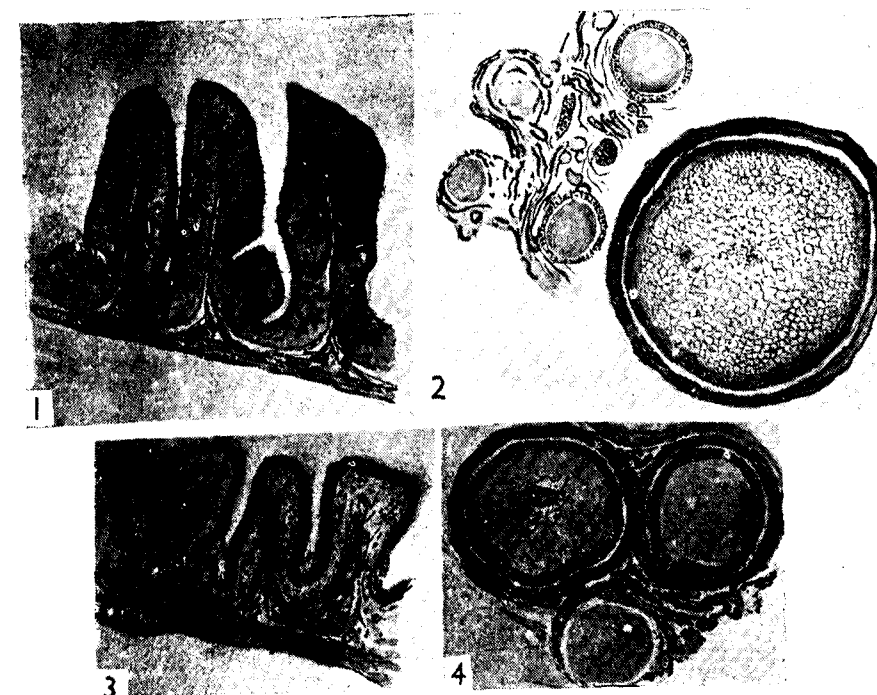
Macroscopic examinations showed marked inhibition of the ovarian growth in contrast to that of the control females. The hormonal action was undoubtedly that of a suppression of the follicular development.

Microscopic observations:—CONTROL FEMALES: Microscopical examination of the oviduct revealed marked growth and development of the mucosa. The mucosal epithelium was of the stratified variety and the lumen of the oviduct exhibited a tortuous condition owing to the inward projection of the villus-like folds of the mucosa. The tubular glands were very well developed in the mucosa (Fig. 1). The connective tissue stroma showed pronounced growth. This tissue extended throughout the axial portion of the mucosal folds and in between the glands. The muscular layer was also greatly thickened.

Histological examination of the serially sectioned ovaries showed high degree of maturation of the oocytes. The latter showed a great amount of yolk deposition and marked stratification of the follicular epithelium (Fig. 2). The interstitial connective tissue was greatly thickened and a pronounced vascularity was evident. **EXPERIMENTAL FEMALES:** Microscopical examination of the oviduct revealed a lumen lined by a layer of cuboidal cells. The mucosal folds appeared as elevations of the sub-mucosa and they were strikingly non-glandular (Fig. 3). The sub-mucosa presented the appearance of a thin connective tissue lamina and the musculature of the duct could be identified as an extremely thin peripheral layer.

The gonads differed remarkably from those of the control specimens upon histological examination. The sections revealed that the non-yolked oocytes predominated (Fig. 4). An immature oocyte resembled a typical cell with

GENITAL HYPOPLASIA IN THE JUVENILE FEMALE PIGEON DUE TO ANDROGENIC TREATMENT



[To face Page 201]

EXPLANATION OF FIGURES

(All figures were drawn with the aid of a camera lucida)

- Fig. 1 Portion of the transverse section through the oviduct of a control female (X 22). Note the well developed tubular glands, and the stratification of the mucosal epithelial layer.
- Fig. 2 Transverse section through the ovary of a control female (X 22).
- Fig. 3 Portion of the transverse section through the oviduct of an androgen treated female (X 22). Note the absence of tubular glands and the cuboidal nature of the mucosal epithelium.
- Fig. 4 Transverse section through the ovary of an androgen treated female (X 22).

A CASE OF NANOMELUS IN A CALF



Fig. 1. A calf with
nanomelus.



Fig. 2. A calf with
nanomelus.

Fig. 3. A calf with
nanomelus.

A CASE OF SCHISTOSOMUS REFLEXUS IN A CALF



Fig. 4. A calf with
schistosomus reflexus.

GENITAL HYPOPLASIA IN THE JUVENILE FEMALE PIGEON 203

slightly excentrically placed nucleus. In fact, the number of oocytes showing indications of yolk deposition was few. This experimentally induced lack of cytosomal differentiation was unmistakeably reflected in the size of the oocytes, the largest of which averages 339.5 ± 1.2 microns in diameter as against 1380.2 ± 1.2 microns of the controls. Moreover, the follicular epithelium was of the simple columnar type.

Discussion

From the data presented in this paper, there seems to be no doubt that testosterone propionate treatment induced ovarian inhibition. The histological consequences of the hormone administration were reflected in the suppression of the follicular growth. The gonadal inhibition as reported here, leads to the conclusion that the gonadotrophic activity of the anterior hypophysis was considerably slowed down. The present results therefore, appear to be at variance with those reported for Indian spotted munia by Kar (1948). In this passerine bird testoid treatment provoked marked ovarian hypertrophy. Possibly, this variability in ovarian response to exogenous androgen in the pigeon and the spotted munia may be ascribed to their specific difference.

The androgen induced gonadal inhibition was closely correlated with a likewise change in the oviduct. This was clearly expressed in the marked histological alterations of the treated oviduct. Thus the conversion of the mucosal folds from a glandular to a non-glandular condition was an unmistakable histological change. The cuboidal nature of the mucosal epithelium and the condition of the sub-mucosa were features of special interest. To these may be added another interesting item, and that is the hypoplasia of the oviducal ligaments in the treated birds. This provides further evidence to the present writer's concept that these structures are dependent upon the estrogenic influence of the ovary (Kyr, 1947 a and b, 1948, 1949).

A question may be raised as to whether the action of testosterone propionate was independent of the presence of the ovary. In this connection the observations of Noble and Wurm (1940) merit special attention. They reported that in ovariectomized night-herons there was stimulation of the oviduct following testosterone propionate treatment. Nelson and Stabler (1940) observed little or no effect on the gonads of nestling and young sparrow hawks following androgenic treatments. In the immature fowl (Herrick, 1944) and the English sparrow (Ringo, 1943) the injection of testosterone propionate caused a stimulation of the oviduct, whereas severe oviducal hypotrophy and hypoplasia has been reported for laying hens after treatment with massive doses of testosterone propionate (Kar, 1947 a).

Judging from the present data it appears extremely doubtful that the androgen acted directly on the oviduct. This can be gauged from the fact that in every instance of oviducal hypoplasia the ovary was also inhibited. It seems

not unlikely therefore, that the oviduct responses in the androgen recipients was induced by the testoid-acted gonad through the intermediation of the anterior lobe of the hypophysis.

Summary

Following daily intramuscular injections of testosterone propionate (1.2 mgm.) into juvenile pigeons (80 days old) pronounced changes were encountered in the female genital system. Considerable ovarian and oviducal hypoplasia occurred in the androgen recipients. Marked histological changes were also encountered in the genital system of the experimental females. It is concluded that all these changes were induced by the testoid through the intermediation of pituitary.

Acknowledgments

Grateful acknowledgment is made to Messrs. Ciba Pharma Ltd., Bombay for the generous contribution of testosterone propionate (Perandien) used in this investigation. Thanks are due to Mr. A. K. Saha for the diagrams which illustrate this paper.

REFERENCES

- Herrick, E. H., 1944 Some influences of stilbestrol, estrone and testosterone propionate on the genital tract of young female fowl. *Poultry Sci.*, 23: 65-66.
- Kar, A. B., 1947a Responses of the oviduct of immature female fowl to injection of diethylstilbestrol and the mechanism of perforation of the oviduct in the domestic fowl. *Poultry Sci.*, 26: 352-363.
- 1947b Studies on the ligaments of the oviduct in the domestic fowl. *Anat. Rec.*, 97: 175-195.
- 1948 Androgen induced changes in the sexual organs of a common Indian bird, the spotted munia, *Uroloncha punctulata* (Linn). *Proc. Zool. Soc. Bengal*, 1: 81-89.
- 1949 Responses of the genital system of the female Indian spotted munia, *Uroloncha punctulata* (L.) to α -estradiol benzoate. *Proc. Zool. Soc. Bengal*, 2: 1-8.
- Nelson, O. E., and R. M. Stabler, 1940 The effect of testosterone propionate on the early development of the reproductive ducts in the female sparrow hawk (*Falco sparverius*). *J. Morph.*, 66: 277-297.
- Noble, G. K., and M. Wurm, 1940 The effect of testosterone propionate on the black-crowned night heron. *Endocrinol.*, 25: 837-850.
- Ringo, A. R., 1943 Effects of injections of testosterone propionate on the female English sparrow, *Passer domesticus* (Linnaeus). *J. Morph.*, 73: 423-439.

EXPLANATION OF FIGURES

(All figures were drawn with the aid of a camera lucida)

- Fig. 1 Portion of the transverse section through the oviduct of a control female (X 22). Note the well developed tubular glands, and the stratification of the mucosal epithelial layer.
- Fig. 2 Transverse section through the ovary of a control female (X 22).
- Fig. 3 Portion of the transverse section through the oviduct of an androgen treated female (X 22). Note the absence of tubular glands and the cuboidal nature of the mucosal epithelium.
- Fig. 4 Transverse section through the ovary of an androgen treated female (X 22).

ADVERTISEMENTS

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

B.W. & Co.

A MARK TO REMEMBER

When writing to advertisers, please mention The Indian Veterinary Journal.

*An advance in
Penicillin therapy . . .*

'AVLOPROCIL'

Procaine-Penicillin Oily Suspension

'Avloprocil' contains the procaine-salt of Crystalline Penicillin in oily suspension and offers important advantages to both doctor and patient:—

- Therapeutic blood levels of penicillin maintained for at least twenty-four hours.
- Effective penicillin therapy achieved with a single daily injection.
- Administration free from irritation and pain.

10 cc. vials (300,000 units of penicillin per cc.)
Singly and in boxes of 5.

Literature and further information available on request.



**IMPERIAL CHEMICAL
INDUSTRIES (INDIA) LTD.**

Calcutta Bombay Madras Cochin New Delhi Kanpur

In Pakistan, Burma and Ceylon

IMPERIAL CHEMICAL INDUSTRIES (EXPORT) LTD.

(A subsidiary company of Imperial Chemical Industries Ltd.)

Karachi Chittagong Rangoon Colombo

VER. 12

THE

Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XXVI

SEPT. & NOVR. 1949

Nos. 2 & 3

Editorial

VETERINARY COUNCIL FOR INDIA

We invite the attention of the Government to the well-reasoned and illuminating article from the pen of Dr. Datta, the Director of the Indian Veterinary Research Institute, Mukteswar, published in the Silver Jubilee Number of this *Journal*, on the urgent need for the formation of an Indian Veterinary Council. 'I have always been distressed whenever I looked at the lack of uniformity that now exists in the standard of equipment and efficiency amongst the members of the profession', laments Dr. Datta. So has everyone who had the interest of the profession been lamenting all along. We have in these pages, time and again, been pleading for the formation of such a Council but the authorities, for reasons best known to themselves, have been keeping silent over the matter. Unlike all other countries in the world, our country has no Independent Veterinary Profession to agitate for progress, for the redress of its grievances and for the relief of its wants and requirements. Practically all the members of the profession are servants of the Government. And, therefore, if anything progressive is to be carried out, it is entirely in the hands of the Government and its expert advisers. If the latter were to be apathetic and indifferent to the needs of the profession, if they are short-sighted in their policies and narrow-minded in their outlook, it need hardly be mentioned that the progress will be nothing, or next to nothing. The organisation will go on in a meandering way, uninfluenced by public opinion and needs. The few non-officials and retired Government servants may give suggestions for improvement: these may be supported by the rank and file by means of resolutions passed at their periodical Conferences. All the same, these suggestions may not go any

further and take any practical shape, if only the men in authority choose to take no notice about them. The present lack of uniformity in Veterinary organisation is only the result of past apathy and indifference. It is on record that, as early as 1924, at the Third All-India Veterinary Conference, held under the presidency of Mr. A. D. Mac Gregor, Principal of the Calcutta Veterinary College, a resolution was passed by the profession urging the need for the formation of a Veterinary Council to look after its interests. Unfortunately, that resolution has remained nothing more than a pious resolution. Since then, the subject has been constantly under demand but nothing tangible has come out of it. Even as early as February this year, we are told, the matter was discussed at the Animal Husbandry Wing meeting held in Mysore and that it was unanimously resolved that an Indian Veterinary Council should be set up as a Statutory Body by an act of Central Legislature. We are not aware of any further action in the matter and we are not sure that the matter has been taken up to higher authorities for giving practical shape to the decision. And, therefore, we earnestly urge on the authorities the need for taking immediate action in the matter. The distressing lack of uniformity in the standard of equipment and efficiency which has been so poignantly expressed by a person in the position and authority of Dr. Datta should be the warning signal that it is time to stop the rot. The effects of the past neglect are already showing themselves in more ways than one and it is imperative that the interests and integrity of the profession are safeguarded so that it may develop and progress on right lines and contribute its share towards the building up of a prosperous Free India with its live stock industry as second to none in the world.

Announcement

Owing to the late publication of the last issue of this JOURNAL (Vol. XXVI, No. 1) — the Special Silver Jubilee Number — and also owing to the high cost of its production, it has been decided to combine the September and November issues of the JOURNAL into one. This Number, therefore, contains both the issues— Nos. 2 and 3.

Ed. I. V. J.

THE XIVth INTERNATIONAL VETERINARY CONGRESS

The second week of August 1949 was a grand momentous week for the Veterinary profession. During that week, there gathered in London distinguished Veterinarians from all over the world in an International Veterinary Congress. Fifty-three countries, including 23 from the Commonwealth, were represented and the delegates were able (to use the words of Dr. B. T. Simms of the U.S.A.) to meet and discuss with confreres from all parts of the earth the many problems which confronted them, particularly the problem of food. From the reports to hand, the Congress has been an outstanding success. The agenda had been prepared with a concentration on 'those conditions which most seriously limit the production of food for man', and, therefore, 'the central theme of the Congress, the world food situation, was asserted to be the most important scientific and practical question of the day'. This is as it should be, because there is no other problem which is taxing the ingenuity of all thinking men than the problem of providing food for the rapidly increasing population on earth.

The pleasure we derived from reading the accounts of the proceedings of the Congress has been greatly diminished when we note that our country has gone unrepresented at this International Veterinary organisation. We are, indeed, deeply grieved over this omission and we wonder who was responsible for it. Whoever it was, he has done a grave injustice to the profession and to the country. To quote the words of the Rt. Hon. Hector McNeil, who opened the Congress, 'Hunger is an international currency; knowledge should be an international passport.' We in this country are suffering from Hunger and are in the grip of an acute Food crisis which can be solved by an intensive effort to eradicate diseases of animals and to improve their productive capacity. In this task, we could have derived immense benefit from participation in organisations like the International Veterinary Congress. 'By pooling our knowledge and our experience, we shall contribute towards the solution of one of the most pressing problems of the day and at the same time improve the economic condition of the livestock of the

country'—these words of the President of the Congress, Sir Daniel Cabot, put in a nutshell the benefits that accrue from such gatherings. It is a great pity that we, in this country, have missed a great opportunity by not participating in this International Congress.

For the benefit of our readers, we propose to publish in this and succeeding issues important portions of the proceedings of the Congress and, to begin with, we extract an 'extended summary' of the speech of Lord Boyd Orr (whom we congratulate on his recent award of the Peace Nobel Prize), which has drawn the comment of being a very human one in both subject and delivery. We wish that those in power also read that speech as it will give them an insight into the potentialities of the Veterinary profession and the need for developing it quickly. It is the one Department which in its rapid development and application 'can do nothing but good.'

THE INDIAN DAIRY RESEARCH INSTITUTE, BANGALORE.

We heartily congratulate the Indian Dairy Research Institute, Bangalore, on its completion of Twenty-five years of useful work. This period has been a memorable period in its life and it has been 'a series of struggles and difficulties' for existence. Fortunately, the Institute has now become fairly well stabilised.

The handsome brochure which has been issued in commemoration of this occasion gives a graphic description of the Institute and 'its services to the cause of dairy research'; it also contains an outline of the future programme. The Institute has already a great record of original research to its credit and, when it is realised that such work was done in the midst of great uncertainties and difficulties, it becomes obvious that the record is one on which the pioneers of the Institute should be warmly congratulated.

Naturally, the completion of such a period has been celebrated with great *eclat* and it is highly gratifying that His



P. SRINIVASAN, G.M.V.C., B.V.Sc., M.Sc.,
Madras Veterinary College,
who took his M.Sc. Degree of the Madras
University in 1949.

[To face Page 211]



Dr. G. VENKATACHALAM, B.Sc., G.M.V.C., M.Sc., Ph.D. (Micb.)
who has just returned home after 3 years' of
Post-graduate study in America.

[To face Page 210]

EAST PUNJAB VETERINARY VACCINE INSTITUTE,
DAGSHAI (SIMLA HILLS).



TECHNICAL STAFF

Photo taken on the even of transfer of S. Mohan Singh Mahli, Superintendent, as Professor of Pathology and Bacteriology at the Veterinary College, Hissar.
Seating—Ch. Sillbani Singh, S. Mohan Singh Mahli, S. Nand Singh,
Standing—Research Assistants—R. L. Gulati, H. M. Bhatia, R. M. Sharma and Capt. V. S. Thapar.

Highness the Maharaja of Mysore was graciously pleased to inaugurate the Silver Jubilee celebrations which took place on the 8th July 1949. In his welcome address, which was at once informative in matter and lucid in style, Dr. Sen, the Director of the Institute, has dwelt on the various aspects of the Dairy Industry in this country. He spoke the truth, albeit the painful truth, when he expressed himself as follows:—'Dairying, both as an industry and as a Science, has been neglected for a long time with the consequence that a country which once was reputed to be literally flowing with milk has been reduced to the near-starvation level so far as this important food product is concerned'. Milk and milk products have become such rare articles with the majority of our people that there is acute famine of these 'protective' foods. Many of the ills from which the people are suffering have been attributed to the absence of these essential 'protective' foods, because it is these foods which enable us to live a healthy life, free from disease and sickness. It is in rectifying this want that the Dairy Institutes can play a vital and prominent part. Dairy Science, in its applied aspect, says Dr. Sen, is essentially an attempt to provide better sustenance for the life of our countrymen, and its development should, therefore, be considered as of primary importance by the organised Government of the country. There can be no two opinions on this point and we hope that the Institute will have all the support it needs from the Government and that it will go on increasing its activities and its usefulness to the country.

PERSONAL

G. VENKATACHALAM, B.Sc., G.M.V.C., M.Sc., Ph.D. (Mich.)

We are glad to learn that Mr. G. Venkatachalam, a Graduate of the Madras Veterinary College, who went abroad three years ago at his own cost for higher studies, has returned home with a Doctorate Degree in Animal Breeding, specialising in Animal Genetics and Applied Statistics. It is very heartening that members of the Veterinary profession in India are getting more and more forward in their technical equipment which is all the better for the future of the profession and the country.

Dr. Venkatachalam had his studies at the Michigan State College. His initial equipment of a B. Sc. Degree of the Madras University with

Mathematics, Physics and Chemistry, prior to his Veterinary qualification at the Madras Veterinary College, has stood him in good stead.

He first took his M. Sc. degree with a thesis on "A study of Lamb Mortality in the Michigan State Flock" which he presented at the 39th Annual Meeting of the American Society of Animal Production held at Chicago in November 1947. As a result of his superior work at the College, he was appointed in 1948-49 as a Graduate Research Assistant in the Animal Husbandry Department of the Michigan Agricultural Experimental Station. In June 1949, he took his Ph. D., with a thesis on "Estimates of Heritability of birth-weight and weaning-weight of lambs".

We understand that, on his way back to India, he visited several experimental Stations and Agricultural Colleges in U.S.A., Canada, England and Scotland and also took the opportunity of attending the XIVth International Veterinary Congress at London in August 1949.

There are very few Veterinarians in this country with a Post-Graduate training in Animal Genetics and, therefore, it is to be appreciated that Dr. Venkatachalam has chosen this subject for his specialisation.

We do hope that his services will be adequately utilised by the Government of Madras.

R. R. TAVARGERI, G.B.V.C., P.G. (Muk.)

Mr. R. R. Tavargeri, Divisional Veterinary Officer, Poona, Bombay Presidency, who retired on the 10th September 1949, after a meritorious service of 34 years in various capacities, was born in the year 1894 at Bijapur and comes from a well-known family of that place. After matriculating from the Bombay University, young Tavargeri joined the Bombay Veterinary College in the year 1912 as a Government scholar. After a successful career at the Bombay Veterinary College, he graduated in the year 1914 and joined the Civil Veterinary Department as a Veterinary Assistant surgeon. He endeared himself to all his clientele by his sincere and honest work and became a very popular officer. He then underwent an advanced course in Animal Husbandry in 1941 at the Indian Veterinary Research Institute. After his return he was promoted to the gazetted rank and posted as Divisional Veterinary Officer, Dharwar and then to Poona in 1945. He had the opportunity to act as an Assistant Director for a short period, and then went on furlough in May 1949 before retirement.

Mr. Tavargeri worked for the All-India Veterinary Association as an active member and was also on the Managing Committee of the Bombay Branch.

Mr. Tavargeri desires to settle in his home town. We wish him all health and happiness in his retired life.

P. SRINIVASAN, G.M.V.C., B.V.Sc., M.Sc.,

It is not often that the subject of Anatomy creates an attraction, although it forms the 'frame work' of Veterinary Science. And, therefore, it is very gratifying to learn that a Graduate of the Madras Veterinary College, Mr. P. Srinivasan, has taken the degree of Master of Veterinary Science of the Madras University, the subject of his thesis being the 'Osteology and myology of the common fowl'.

Mr. Srinivasan has had a distinguished academic career. After taking his degree of Bachelor of Veterinary Science from the Madras Veterinary College, he joined the Civil Veterinary Department, Madras. He was on itinerant work for a short while and then joined the staff of his *alma mater*. Working under that able anatomist, Rao Sahib H.N. Chelva Iyengar, as an assistant, he registered himself as a Research Scholar for M.Sc., degree and took that degree in April 1949. It is also pleasing to note that he holds the Diploma in German. With these equipments, Mr. Srinivasan should advance further in his profession and we hope that he will get all the encouragement he needs from the Government.

THE WORLD FOOD SITUATION*

By

LORD BOYD ORR, D.S.O., M.C., F.R.S.

Veterinary Medicine is one of the few branches of science in which knowledge can be increased and applied without the danger of doing more harm than good. The advances of physical science in the last 50 years are a positive danger to our civilisation. The aeroplane and the wireless have made the world so small and brought the nations into such close contact with one another that they must devise means of living together in peace. But this is difficult because each has its own historical and psychological background, its own religion and way of life, and its own nationalist and imperialistic ambition, and finds these threatened when it is suddenly thrown against other nations with different ideologies and ways of life, each nation being afraid of infiltration of alien ideals.

The rapid advance of technology in industry is not an unmixed blessing. I am referring not to the atomic bomb but to the economic system. The new raw materials and the rapidity with which they can be transformed into finished goods has enabled us to produce all kinds of industrial goods in abundance. In the U. S. A., which was outside the battlefield, industrial production has increased by 100 per cent. during the

*Basis of Plenary Lecture delivered before the XIVth International Veterinary Congress, on August 8th 1949. *Vet. Record* Vol. 61, No. 33, Page 491.

war. There is difficulty in getting the output of modern industry dispersed and consumed. Unmarketable surpluses lead to unemployment. In the U.S.A. unemployment has now reached 3½ million. Unless world markets can be expanded there is the danger of unemployment in all highly industrialised countries, leading to another world economic crisis.

The advance in human medicine is raising the problem of whether the earth can be made to provide food for the rapidly increasing population. At the present rate of increase of 22 millions a year, the pre-war population of 2,000 millions will reach 3,000 in 40 years. If preventive medicine be applied to the elimination of disease in Asia, Africa and Latin America, where the expectation of life at birth is only 30 to 40 years, as it has been in Western Europe, North America, and the British Dominions, where it is now 60 to 70 years, the rate of increase will be much faster. In an area of New Guinea where insect-borne diseases were eliminated, the fall in the death-rate has been so great, especially among children, that the rate of increase has risen to 10 per cent. per annum. In Sardinia, where preventive medicine is being applied under the supervision of the Rockefeller Foundation, the infant mortality rate has fallen by over 60 per cent. in two years.

While the population is increasing, the area of fertile land which can be easily cultivated is decreasing through soil erosion, due to the pressure of population on the land. Vogt, the head of the Pan-American Soil Conservation Service, in a recent book, suggests that preventive medicine should be curtailed until disease and famine reduce populations of overcrowded countries to what their land will carry, and birth control measures be applied to prevent an increase above that level.

With modern agricultural and engineering science, world food production could be doubled in less than 25 years, provided governments would co-operate in a world food plan such as I suggested in 1946 when I was Director-General of F.A.O. and which was approved by the United States and welcomed by the majority of governments. But it is difficult to do with each nation pursuing its own policy, within its own territory. Some have not got the industrial products for the necessary flood control and irrigation schemes, and agricultural equipment. Some are trying to bring new land into cultivation and finding the cost exceeding the original estimate. Others, on the other hand, find the production of cereals and sugar for human consumption and coarse grains for animal feeding so easy that they are afraid of unmarketable surplus. The U. S. A. increased wheat production by 70 per cent. during the war when there was a market at a good price for everything which could be produced. Now prices are falling and farmers are cancelling their orders for industrial products and so contributing to the growing unemployment.

Feeding the world is not so much a scientific problem. Science knows the answer. It is rather one aspect of the general economic and political problem. The chaotic state of the world to-day is due to the difficulties of adjusting an international political system which evolved when the horse was the quickest means of transport and communication, to one to suit the aeroplane and the wireless, which make old political boundaries meaningless and change the economic system which evolved in a world of scarcity, to one which can carry the great potential wealth which science has made possible.

Veterinary Science has not, so far at least, raised any political or economic problems. The world is desperately short of animal products, and in some countries, especially in Asia, of work bullocks. This shortage can be made good by the elimination of disease and better feeding and management. The advances in Veterinary medicine are comparable with those in human medicine. Indeed, it is the same science, though one branch is applied only to human beings, whereas the veterinary branch has to deal with all species of domestic animals. The rapid development and application of Veterinary science can do nothing but good. If at some distant date we find we have too many animals we can, unlike human medicine, kill off the surplus, the worst, and so improve the breeds.

The great success which Veterinary Science has achieved in eliminating diseases where it has been applied is an indication of what can be done on a world scale. In the control of cattle diseases there are three phases: the eradication of the major "killing" diseases, the control of chronic infectious diseases associated with intensive farming, and the avoidance of metabolic troubles apparently connected with excessively high productivity.

The countries still in the first phase of animal disease control are India, many parts of Africa, and Eastern Asia. In these countries major epizootics, such as cattle plague (rinderpest), bovine pleuro-pneumonia, glanders, and certain protozoal diseases cause high mortality, and, consequently, the value of the individual animal and its productivity is low. Nevertheless, the monetary losses, as well as the losses in food, are enormous. For example, in India, where the total food-producing animal population is well over 200 million, the mortality from cattle plague was, until recently, well over 50 per cent. Since the introduction of preventive inoculation, however, this loss has been reduced by one-tenth of this. It still remains high, however, the loss being in the region of one million head of cattle per annum. There is little doubt that this could be still further reduced if the veterinary services were extended. As an indication of the value of the food loss arising from animal disease in the Indian Union, it has recently been estimated that this is in the region of six million rupees a year.

Another result that indicates clearly the value of disease control measures is the scheme carried out in China by F.A.O. where 300,000 water

buffaloes were recently inoculated against cattle plague. The majority of these animals were thereby prevented from dying and were, consequently, able to plough the land. Normally each buffalo ploughs in a year land which will yield five tons of grain, so it is estimated that over 100,000 tons of extra grain were grown as a result of these veterinary measures.

Great Britain has passed to the second and third phases in the control of animal disease, having eradicated cattle plague since 1866. Nevertheless, it is interesting to remember that in this type of control stringent measures must be adopted as otherwise the eradication of the disease may be very tardy. For example, there was a great outbreak of cattle plague in this country in 1714 when strict measures of control were introduced, and the disease was eradicated within three months. In 1745, however, when another widespread epizootic occurred, the control measures were applied only half-heartedly, and the disease was not eradicated for 15 years. Even in the last outbreak of rinderpest in Great Britain in 1865-66 the number of cattle involved was 324,000. Let us hope that the present loss of eggs and poultry meat arising from the re-introduction last year of fowl pest into this country will not be allowed to continue through the adoption of half measures. It is essential that veterinary police measures be associated with the elimination of sources of infection, a fact which may cause us to stop the importation of poultry meat from certain countries where this disease still exists.

Once the major "killing" diseases are brought under control, livestock farming usually becomes more intensive and certain chronic infectious troubles arise. Great Britain may be considered to be in this state, as indeed now are many of the Commonwealth and Colonial territories, the countries of Western Europe, and United States of America. The diseases causing greatest losses in these countries are mastitis, contagious bovine abortion, tuberculosis in some, infertility, and parasitic diseases. These diseases refer mainly to cattle, but there are similar diseases for the other domesticated animals. From some of these countries tuberculosis of cattle has been eliminated by a combination of detection and slaughter of infected animals, and the adoption of hygienic methods of management. For example, tuberculosis in dairy cattle with its dangers to the human population has been practically eliminated from the United States and certain other countries. The eradication scheme in the United Kingdom has been intensified recently, but is still a long way from success, owing largely to the difficulty in controlling the disposal of the infected animal.

The other diseases in this group—mastitis, contagious abortion, infertility and parasitic diseases—all give rise to great losses. A recent estimate of the monetary loss per annum arising from diseases in dairy cattle in the United Kingdom is of the order of £30 million, or in terms of food value, 200 million gallons of milk. These losses have been curtailed to

some extent by the recent use of sulphonamide drugs and penicillin, and the wide application of a vaccination scheme for the control of contagious abortion.

As these chronic infectious diseases are brought under control, animal productivity increases, and a number of digestive or metabolic disturbances occur. Sometimes these troubles are associated with a deficiency in the pasture, such as cobalt, copper or phosphorus, which may give rise to death or extreme weakness in large numbers of animals. Cobalt deficiency pining, which is very prevalent in sheep in Australia, New Zealand, and certain parts of this country, has been largely controlled by the addition of cobalt to the pastures. Many years ago it was difficult to keep cattle under ranching conditions in much of South Africa, but the trouble has been largely overcome through the widespread use of bone-meal supplements. Many other deficiency diseases exist and methods are known for their control, but there are still many which have not yet been unravelled.

To sum up: It is evident that there are many diseases of animals causing huge losses in food-stuffs such as milk and meat throughout the world. Whilst in certain countries these losses are, to some extent, controlled by an efficient veterinary service, in many others, the facilities for this service have not been granted. If the control of animal disease could be organised on a world-wide basis, there is no doubt that with our present knowledge we can enormously increase the amount of dairy and meat products available for human consumption. It is difficult to estimate the loss in human food-stuffs throughout the world due to preventable diseases in animals, but it must run to millions of tons per annum.

Here there is a great field for Veterinary Science. Unfortunately, like all other branches of biological science which seek to enrich the world in the equal interest of the people of all countries, it is starved for funds. The Veterinary profession needs a strong international organisation, on the lines of the World Health Organisation, through which governments could co-operate more actively in the elimination of preventable diseases on a world scale. It might be linked up as part of, or at least closely allied with the Food and Agricultural Organisation. The difficulty is to get the necessary funds and get governments to co-operate. It is perhaps to a Congress such as this that the world must look for a lead. You already have your International Veterinary Committee which, with full support from veterinary organisations throughout the world, might become sufficiently strong to persuade governments to give it the necessary money and power.

I venture to suggest that in addition to considering technical problems which are of interest mainly to the professors, this conference should consider ways and means of bringing about a greater unity

in the veterinary work of different countries, and how best the research stations and services of the better equipped countries can assist those who are worst equipped and in most need of the application of veterinary science. By such international co-operation in applying science for the benefit of the people of all countries, governments may become less obsessed with political conflicts and more inclined to work together for their mutual advantage to create a world of plenty. Scientists and professional men who know what modern science can do if applied on a world scale should urge governments to co-operate in constructive measures which can be kept out of the area of political conflict. Such international co-operation can be an important step to a world of unity, prosperity, and peace.

Clinical Articles

A CASE OF *NANOMELUS* IN A CALF

BY

G. R. MURKIBHAVI, G.B.V.C.,

Lecturer, Bombay Veterinary College.

On 20th January 1949 at 2 p.m. a cow was brought to the Bai Sakarbai Dinshaw Petit Hospital for Animals for calving with a history that the animal was in labour since the previous day but with no result.

The cow was a 'Gir', aged about five years, and this was her second calving. The local 'Gowalas' had attempted to remove the calf without success. On arrival at the hospital, the animal was noticed to be in a good state of health. There was discharge from vagina and both the vulvar lips were inflamed. The temperature was 102.8° F. The cow was straining much and was exhibiting uneasiness.

The genitalia were washed with antiseptics and with due precaution P. V. examination was done. This revealed a breach presentation with tail and limbs fixed at the cervix. After a further careful manipulation it was specifically ascertained that the limbs which were felt were hind legs, although from the way in which the hock joints moved, they appeared to be front ones in the first instance. To facilitate the extraction of the calf, the cow was given a dose of chloral hydras as a narcotic. The foetus was then retropulsed and the legs were straightened up. They were then firmly secured and the foetus was removed by traction. The calf did not appear normal. The placenta was

manually removed and a douche was given. At about 10 p.m. eversion of uterus was noticed which was attended to by putting truss and by oral administration of chloral hydras. After two days the animal had a little rise of temperature when Soluseptasin intravenously and Sulphanilamide orally were administered. The temperature came to normal after three days. Subsequently the animal was discharged fit.

Description of the calf:—The general condition of the calf was of under-development with a peculiar confirmation of limbs in general, and hock and knee joints in particular. The hind limbs were short and crooked with the hocks bending backwards—*N. Compyloscelus*—while the front limbs were only short and deformed—*N. Camphlochirus*. The enclosed photo of the hind limbs as well as of the entire calf will clearly illustrate the condition. The calf died about thirty minutes after birth.

My thanks are due to Dr. S. J. Khambate and Dr. S. Hattangady, Assistant Professors at the Bombay Veterinary College, for their kind help and co-operation.

A CASE OF *SCHISTOSOMUS REFLEXUS* IN A CALF

BY

R. B. SARMA, G.M.V.C.,

Veterinary Assistant Surgeon, Chidambaram.

On 7-2-49, at about 7 P.M., a small sized local-bred cow, age four teeth, primipara, was admitted into the hospital for dystocia. A portion of omentum and coils of intestines were hanging out from the vulva.

History:—For the size of the cow, its abdomen during pregnancy was very big and the owner suspected twins. On 4-2-49 at about 7 P.M., it is said, the animal discharged some quantity of fluid, probably amniotic, and that, thereafter, the size of the abdomen got considerably reduced. Again, at about 3 A.M. on 7-2-49, there was discharge of some more of the fluid (amniotic?) and labour pains started. Till about 11 A.M. there was no progress in the delivery of the calf and the owner thereupon decided to get the animal to the dispensary, which he did very late in the evening. It was also ascertained that the villagers who had attempted to effect a delivery suspected breach presentation.

Diagnosis and treatment:—On examination it was observed that the case was one of breach presentation with some abnormality. The presence of the coil of intestines could not be accounted for at that stage. The cow was given a dose of chloral hydras and, with some difficulty, delivery of a dead calf was effected.

Findings.—The calf was well developed. Its back portion, in a line with the umbilicus, was folded over the left side. The hind legs were carried forwards with the region of the perineum spread out. The abdominal walls on both sides were everted with the ribs folded forwards. The entire contents of the abdomen were freely hanging outside the body. The fore legs were bent round the neck of the calf. (Vide photo). It was a good specimen of *Schistosomus reflexus* so rarely found. Unfortunately, the cow died on the night of 9-2-49 in spite of every treatment.

CONTRACTED TENDONS IN A BULL CALF

BY

G. Y. PANSARE, B.Sc., G.B.V.C.,

Veterinary Officer, Kannod, Madhya Bharat.

Subject.—Gondwana bull calf, about a year old.

History.—The animal was said to have been in perfect health with all its four legs quite normal till the age of about ten months, when one day it got its right fore leg entangled in the wheel of a bullock cart kept by the side of the hut. The calf struggled to free its leg but could not until it was released by a passer-by later on. Since then the animal has been lame on that leg and now it was walking practically on the anterior surface of fetlock and hoofs with the soles of both the claws turned upwards.

Diagnosis.—On examination it was found to be a case of excessive contraction of the back tendons of the right fore leg.

Treatment.—Tenotomy was the only thing that could give relief to the animal and it was decided to do it at once. The animal was given a drench of 30 grains Chloral Hydras dissolved in four ounces of water and treacle. After half an hour the animal was cast and its legs secured. The site of operation, viz, the posterior aspect of the right fore pastern, was clipped and cleaned with the usual precautions. With an incision over the skin, the bifurcations of the flexor tendons were exposed and cut. The skin incision was then closed with sutures. Thereafter, the foot was extended and fixed in a normal position with three light splints, cotton wool and bandage extending from the fetlock joint to the toe. The animal was then released.

The wound unfortunately did not heal by first intention and was, therefore, treated as an open wound from the fourth day. It healed satisfactorily and, at the time of discharge four weeks later, the animal was bearing weight on the foot and was able to walk and run like a normal calf.

HAEMORRHAGIC SEPTICAEMIA.

SUCCESSFUL TREATMENT WITH SULPHAPYRIDINE (M. & B. 693)

BY

HARJAS RAI, L.V.P., Assoc. I.D.R.I.,

Director of Animal Husbandry, Ajmer-Merwara,

and

A. D. LILARAMANI.

An outbreak of Haemorrhagic Septicaemia among cattle and buffaloes was reported in a village near Beawar. 9 Buffaloes and 2 cows had already died and the remaining 4 animals—one buffalo and 3 bull calves—were brought to the Veterinary Dispensary at Beawar for treatment. The following symptoms were observed :—

The animals were dull, depressed and completely off-feed. The breathing was dyspnoeic and oral. Temperature ranged from 106 to 107.2° F. in all cases. A certain amount of swelling at the throat region, with slight oedema extending towards the mandible was noticed in two cases. Blood smears were negative for parasitic organisms, but smears from the throat swelling were positive for Haemorrhagic Septicaemia.

Treatment.—20 to 25 tablets of M. & B. 693 (Sulphapyridine), according to the size of the animal, were administered in the morning and the same dose was repeated in the evening. On the second day, the temperature came down. The dose was repeated again both morning and evening. On the third day, the animals showed a tendency to eat and they were well on their way to recovery. Four more cases were given similar treatment. Out of the 8 animals treated, 6 recovered completely. One buffalo and one buffalo-calf were taken away before the treatment was complete and both of them died afterwards.

All the healthy animals of the village were protected by H. S. Serum and the outbreak subsided.

Mention should be made in this connection that, in certain H. S. outbreaks elsewhere, the same M. & B. 693 had not proved a success. Hence it is presumed that different strains of *Pasteurella bovisseptica* exist in different localities and that M. & B. 693 is effective, perhaps, only against certain strains and not all of them.

We take this opportunity to offer our thanks to Sri N. S. Sankaranarayanan, Veterinary Investigation Officer, Rajputana, Ajmer, for valuable advices given during the course of the diagnosis and treatment.

TIGER-MAULED CASES—SUCCESSFUL TREATMENT WITH PENICILLIN

BY

S. B. GALIGI, G.B.V.C.,

Veterinary Assistant Surgeon, Sirsi, Bombay Province.

The Sirsi Taluka in Bombay province has a wide range of forests inhabited by tigers, panthers and other wild animals. They attack cattle when they go about grazing and either kill them outright on the spot, or maul them very severely. The tiger usually springs at the throat of the animal and, as such, the injuries are chiefly found in the throat region. These injuries become septic very soon and, when they are severe and deep seated, cause death of the animals. Ordinary antiseptics have failed to cure such mauled animals in many cases and therefore Penicillin was given a trial in their treatment. The results have been satisfactory as the following cases will show:—

The first case was a cow. It was brought to the Hospital on 6th January 1949 at 4 P.M. with the history that it was mauled by a tiger in the field at 1 P.M.

Symptoms:—The cow was nervous with a distressed look. There were many scratches all over the body with inflammatory swellings surrounding these scratches. Four wounds were found in the region of the throat of the animal caused by the teeth of the tiger. Two of these were very deep and had punctured the trachea. Every time the animal breathed, air gushed out from these injuries. There was diffuse swelling around the throat and neck with slight crepitus. Temperature was 102.4°F.

Treatment:—All the wounds were cauterised with Acid Carbolic and dressed with Zinc Oxide. Sulphanilamide was given internally.

7th January 1949:—Temperature was 103°F. Swelling in the throat had increased. Animal was duller and could not walk. An intramuscular injection of 15 Grms of M. & B. 693 in 45 c.c. of distilled water was given in the morning. The wounds were washed antiseptically and dressed with Sulphanilamide powder. Another injection of M. & B. 693 was given in the evening.

8th January 1949:—There was no improvement in the animal. The swelling had increased much, the breathing became distressed and stertorous, and deglutition difficult. Temperature was 105°F. Tongue was swollen and mouth held open with roapy saliva. The head was kept fixed and could not be bent down or sideways. With the swellings on, the animal looked like a hippopotamus. She spent a restless night.

With the consent of the owner, 200,000 units of Penicillin were given intramuscularly every four hours. The dressing of the wounds was continued. By evening, the swelling decreased slightly, temperature came down to 102°F. the animal looked a bit lively and could take a little kanji.

9th January 1949:—Temperature was 101°F. Swelling in the throat had subsided leaving it circumscribed at the region of the throat. The injuries on the body had formed scabs and were quite healthy. Still, three more injections of Penicillin were given that day. In all, the cow received 1,800,000 units of Penicillin in thirty-six hours. All the wounds healed early with the daily application of Soluseptasine ointment. A circumscribed abscess of the size of a cocoanut formed at the region of the throat which was later opened and healed without any trouble.

Another tiger-mauled case in a bullock at Indoor colonisation centre in Mundgod Taluka was treated similarly with Penicillin and was found effective.

CANINE DISTEMPER—ITS TREATMENT WITH SOLUPYRIDINE AND SULPHATHIAZOLE (M. & B.)*

BY

M. S. GANAPATHY, G.M.V.C., B.V.Sc.,

Assistant Lecturer in Medicine, Madras Veterinary College, Madras.

Distemper is a highly prostrating, infectious and inoculable disease peculiar to the dog and, probably to some other carnivorous animals, running a variable and prolonged course, characterised by pyrexia, cutaneous eruptions and catarrh of the various mucous membranes. It is often followed by serious sequelae involving the pulmonary, gastro-intestinal, nervous and skin systems. It is caused by a filterable virus. The disease is transmissible by inhalation, or even by ingestion. All breeds are equally susceptible, though highly-bred dogs have been found to suffer more from the effects of this disease. Puppies from the weaning period to that of dentition show but little resistance to the infection and the majority succumb to its influences. This is specially noticeable in the various delicate Toy breeds as Dachshunds.

Many proprietary preparations with claims of possessing very useful properties in protecting susceptible animals against this disease are available in the market. It has been found that most of them possess neither prophylactic nor curative values. However, the anti-distemper serum of Messrs. Burroughs Welcome & Co., if given in the early stages of the disease, was found in some

* Paper read at the monthly meeting of the Madras Veterinary Assistant Surgeons' Service Association, on 15th January 1949.

instances to cut short the course of the disease, or convert a severe attack into a mild one. Its non-availability during World War II gave opportunities to search for other useful remedial measures against Distemper. In the course of our study with several preparations, Solupyrindine (M & B) was found to give very encouraging results. It has been found that the drug, to be effective, should be given at the very commencement of the disease i.e., before the onset of any secondary complications.

The symptoms of Distemper are too well-known to every one to be narrated here. A watery or serous flow of discharge from the eyes, or nostrils, or both, is very characteristic of Distemper at its commencement. This symptom, together with a high rise of temperature, the young age of the animal and a hoarse cough, particularly when the animal is made to move, should be enough for a practitioner to diagnose Distemper at its earliest stage. Solupyrindine, when given at this stage only, has been found to be very effective.

Trials were made with 1 to 3 c.c. of the preparation according to the age and condition of the animal. The preparation was diluted with an equal volume of sterile distilled water and injected intravenously. The effect of this preparation was subsequently maintained by concentrating the system with Sulphathiazole, administered orally, commencing from the fourth hour after the injection, and giving it at six-hourly intervals thereafter. The above treatment with both Solupyrindine and sulphathiazole was computed at the rate of one grain per pound of body weight and it was gradually tailed off through the succeeding days from the third day onwards. The patients became brighter, the catarrhal symptoms disappeared and their appetite returned to normal generally by the fifth day. With proper nursing and hygienic surroundings, most of the cases invariably ended in recovery. The after-treatment consisted of a course of bitter tonics and hæmatenics.

Ten cases have been tried so far and, of these, seven resulted in total recovery. Three cases, however, died due to secondary complications as pneumonia or gastro-enteritis.

Before concluding this paper, I would like to discuss the probability of the mode of action of this preparation. It is a known fact that the virus of Distemper highly devitalizes the system of the affected animals. This is particularly marked in young animals. Further, the sequelæ of Distemper are brought about by the invasion of secondary organisms, which normally lead a saprophytic existence in the system, and which become pathogenic on account of the lowered vitality of the animal. Most of these organisms are amenable to treatment with sulfa drugs. All sulfa drugs are bacteriostatic. The administration of solupyrindine by the intravenous route ensures rapid absorption of the drug and keeps these secondary invaders under check. It is presumed that solupyrindine, on account of its being administered at the very commencement of the disease, when the virus has had no time to sufficiently devitalize the

system as to make the secondary invaders pathogenic, and coupled with the bacteriostatic effect brought about by the preparation, cuts short the course of the disease to a great extent with early and favourable termination. The effects of solupyrindine are further maintained by concentration with sulphathiazole. The administration of sulphathiazole alone in the early stages of Distemper had not had the desired effect. Though it is advised that 1 c.c. of the preparation for each three pounds body-weight should be given as the initial dose, the indications of sulfa drugs not being fully established in these cases, I considered a decidedly lower dose, that is 1-3 c.c., should be enough to prevent the saprophytic organisms from becoming pathogenic. It is also worth noting here that all the recovered cases were seen by me periodically and found that none of them developed any complications or recurrence of the disease. The number of cases tried so far may not be considered as adequate enough to arrive at a definite conclusion regarding the efficacy of this drug in the successful treatment of Distemper and I request that it may be given a wider trial and its results reported.

My thanks are due to Sri. M. R. Subramania Sastry, Retired Lecturer in Pharmacology and Therapeutics, for his help and valuable suggestions in the early trials with this preparation. My thanks are also due to the Principal, Sri. S. V. Mudaliar, and to the Lecturer in Medicine, Mr. Bertie A. D' Souza, for their encouragement in preparing this paper. My thanks are also due to Messrs May and Baker Ltd. for supplying the samples of this preparation.

DISTEMPER IN DOGS AND ITS TREATMENT WITH SOLUPYRIDINE

By

D. NILAKANTA AYYAR, G.M.V.C.,

Veterinary Assistant Surgeon, Saidapet, Madras.

Solupyrindine is a recent addition to the group of sulpha drugs put into the market by Messrs. May & Baker. It has been recommended in the treatment of Distemper in dogs. The drug was tried on three cases of the disease and the results obtained are quite encouraging. Out of the three, two recovered without any of the complications commonly associated with the disease and within a shorter period than is ordinarily required for a distemper case to recover. The other, a young Alsatian pup, died on the seventh day of the treatment developing convulsions. The particulars of the treatment are given below :—

*Case No. 1:—*A Spaniel dog aged about 5 years. Temperature 105°F. Purulent discharge from eyes and nostrils. Characteristic distemper pustules on

the abdomen. Completely off feed. Auscultation revealed extensive bronchitis. Blood smears were negative for protozoan parasites.

Solupyridine 5 c.c., diluted with 5 c.c. distilled water, was given intravenously; also sulphathiazole 2 tablets twice daily.

Second Day:—Temperature 103.2°F. Took a little milk and glucose. Treatment was repeated.

Third Day:—Temperature 102°F. Cough much better. Took milk and bread. Discharge from eyes practically nil. Nasal discharge less but still present. Repeated treatment.

Fourth Day:—Temperature 102°F. General condition very much better. Animal lively. Took feed. Gave only Sulphathiazole 1 tablet and the owner was advised to bring the dog if the improvement was not kept up. Four days later, it was reported that the dog was normal.

Case No. 2:—A black Cocker Spaniel, aged about 2 years. Symptoms on admission: Temperature 105.4°F. Lachrymation, bronchitis, and purulent discharge from nostrils. Complete aversion to food. Eruptions on the abdomen. Blood negative for protozoan parasites.

Treatment was carried out in the same manner as in case No. 1 and a complete recovery took place on the 7th day.

Case No. 3:—An Alsatian pup, aged 2 months, with typical symptoms of distemper. The pup had been sick for about 5 days and was rather late when brought for treatment. Treatment consisted of daily intravenous injection of 3 c.c. Solupyridine mixed with an equal quantity of aqua distillata, and sulphathiazole 1 tablet twice daily. Even though the temperature came to normal on the third day, convulsions appeared on the fourth day and the dog died on the 7th day.

It may, perhaps, be not prudent to draw conclusions on the results obtained from only three cases, and trials on a large number of cases may be required to assess the value of the drug. But, as this is the only drug which has so far given me some satisfactory results in distemper, it deserves a further and greater trial at the hands of the profession.

I have never been an advocate of our students going abroad. My experience tells me that such, on return, find themselves to be square pegs in round holes. That experience is the richest and contributes most to growth which springs from the soil. But, today, the Craze for going abroad has gripped students.

Gandhiji — 1946

SCHISTOSOMA SPINDALIS INFECTION IN A COW— TREATMENT WITH ANTHIOMALINE (M.&B.)

By

S. N. VAIDYANATHAN, G.M.V.C.,

(Addl.) Asst. Lecturer in Animal Hygiene,
Agricultural College, Coimbatore.

'Anthiomaline' (Lithium antimony thiomalate) is a compound containing 16 per cent of antimony in a trivalent form. It is supplied by the makers as a 6 per cent solution, each c.c. containing 60 mgm. of lithium antimony thiomalate, equivalent to 10 mgm. of antimony. It is chiefly given by intramuscular injection and is reported to be largely free from the unpleasant reactions following the intravenous injection of other antimony compounds. A booklet published by May & Baker (India) Ltd. gives several details of this preparation interesting to the Veterinarian.

In the human subject, Anthiomaline has been widely used in the treatment of both the *haematobium* and *mansoni* types of *Schistosoma* infestation. In the veterinary subject, its use is recommended in the treatment of a number of tropical parasitic diseases, notably Nasal Granuloma of cattle (Schistosomiasis). The drug is advised to be used in doses of 20 c.c. to adult animals and repeated once or twice at weekly intervals at the discretion of the veterinary surgeon.

The following is a report on the successful use of Anthiomaline in a case of intestinal schistosomiasis caused by *Schistosoma spindalis*. The subject of the case was a cross-bred white cow, aged about 8 years.

Previous history:—The owner had observed a rapid running down in the condition of the cow during the months of November-December 1947. There had been frequent passage of loose dung with blood and mucus since 8-12-1947, six to ten times each day, and on each occasion after some straining and passage of flatus. Veterinary aid had been sought earlier during the middle of December 1947 without any benefit. The writer took over the case on 10-1-1948.

On examination, the animal was found to be in a very emaciated condition. It had completed three calvings and was now pregnant 5½ months. The evening temperature was 103.8°F. The dung was loose mixed with blood and mucus. Feeding and rumination were normal. There was also a complication with chronic hæmaturia.

Pending the result of examination of the dung, the following was administered at 4 P.M.—

Oleum Terebinthinae	...	4 drams
Acid Carbolic	...	$\frac{1}{2}$ dram
Tr. Belladonna	...	3 drams
Oleum arachis	...	10 ounces

11-1-49.—The owner reported that the animal had passed during the night loose motions three times. After each motion, the cow would strain, make a grunting noise, pass a little flatus and then about two ounces of blood-stained stools and mucus.

Examination of the dung revealed numerous ova of *Schistosoma spindalis* and colourless eggs of trematodes—probably those of *Paramphistomum* species.

As a first step, the owner was advised to stall feed the animal during treatment with a view to preventing further infestation.

The weight of the animal was estimated at 500 pounds. 17 c.c. of Anthiomaline (M. & B.) was given subcutaneously on one side of the neck. Kanjee diet was prescribed with straw *ad libitum*. The following powder was prescribed morning and evening in Kanjee.

	Creta Preparata	...	$\frac{1}{2}$ an ounce
	Kaolin	...	1 ounce
	Calcium Gluconate	...	1 ounce
Also	Calcium Gluconate	...	1 ounce
	Sodii Bicarb and	...	
	Pulvis Zingiberis each	2 drams in the form of an electuary with treacle at noon.	

These were repeated for four days. There was a slight swelling at the seat of injection which passed off with hot fomentations.

15-1-48.—The dung was somewhat semi-solid; there was less blood and mucus. No straining was observed. The animal was put on a carminative powder $\frac{1}{2}$ an ounce morning and evening.

16-1-48.—Formed dung was passed. There was no blood or mucus. Carminative powders were repeated and the owner was advised to give one ounce of bone-meal every day in food.

17-1-48.—Very stray eggs of *S. spindalis* could be detected in the dung; there was no change in the output of the *Paramphistomum* eggs, however.

13 c.c. of Anthiomaline (M & B.) was given subcutaneously and the owner provided with a week's supply of tonic powders with instructions to send samples of dung every week.

24-1-48.—No ova of *S. spindalis* could be detected in the dung and this continued to be so till 15-2-48.

On 2-2-48 the dung contained 2 or 3 pieces of shed mucus, probably denuded pieces from the surface of the healing intestinal ulcers. No eggs of *S. spindalis* could be detected even in these teased tissues. A stray piece or two of such tissue used to be passed in the dung from then on without revealing any ova of *S. spindalis* in them. However, ova of *Paramphistomum* species could always be detected in the samples of dung as usual.

19-2-48.—The owner reported that the animal passed once daily from the 15th February some clotted blood in the dung which was slightly semi-solid. The condition of the animal was, however, greatly improved.

The blood clots revealed ova of *S. spindalis* while the dung contained *Paramphistomum* eggs in the usual concentration.

20-2-48.—Injected subcutaneously 20 c.c. of anthiomaline (M & B.)

28-2-48.—Stray miracidia of *S. spindalis* were detected in the dung; the dung was somewhat well-formed from the 24th itself without blood or mucus. Injected subcutaneously 20 c.c. of Anthiomaline (M & B.).

Sample of dung examined on 2-3-48 was free from ova of *S. spindalis*. The dung was examined regularly twice a week for a month and weekly thereafter for another month. In none of these could ova of *S. spindalis* be detected nor in a last sample examined on 21-7-48. It is believed that the parasites had been completely eliminated.

On 12-5-48—the cow calved a viable bull-calf.

During the course of treatment and with the advancement of pregnancy there was great loss of blood due to chronic haematuria and this prevented the animal picking up condition as well as it would otherwise have done. In spite of the poor condition, the dosage and frequency of treatment with Anthiomaline (M. & B.) did not cause any ill effect.

In the follow-up of this case, which was possible till as late as 1-2-49, it was found that there was no recurrence of the old trouble. The animal is again in calf with its fifth calf.

The following observations made during the course of treatment may be of interest to the readers. According to the owner, the quantity of blood passed each day in the urine previous to treatment with Anthiomaline was very negligible and it was only of a light-red tint. With the commencement of

these injections, the colour changed to a rich-red and the urine was passed more frequently and in larger quantities. The loss of blood was, therefore considerable. There was a gradual improvement for the better some one month, after the cessation of treatment. A month after calving, the urine returned to the condition existing previous to treatment. Some four days after the last injection of Anthiomaline, most probably due to the excessive loss of blood in the urine and also advancing pregnancy in a weakened state, the animal went down and was unable to get up. 1½ ounces of Calcium boro-gluconate given in the form of a 20 per cent aqueous solution subcutaneously, once weekly on three occasions, reinforced with tonics, set the animal right.

Acknowledgment

The author is greatly indebted to Francis Joseph, G.M.V.C., P.G. (Muk.), Lecturer in Animal Hygiene, Agricultural College, Coimbatore, for kind encouragement given during his attempts to formulate a suitable dosage for the successful treatment of the condition.

ASCARIS VITULORUM - PRENATAL INFECTION IN CALVES

By

S. N. VAIDYANATHAN, G.M.V.C.,

(Addl.) Asst. Lecturer in Animal Hygiene, Agricultural College,
Coimbatore.

In making an analytical study of the cases attending the Agricultural College Veterinary Hospital, Coimbatore, during a period of 16 months from July 1945 to October 1946, it was found that, amongst calves, the following disease conditions were commonly met with. Arranged in their order of frequency, they were Ascariasis, Deficiency diseases (minerals and vitamins), Coccidiosis, Navel infections, (Abscess, Septic navel, fly blown ulcers), Respiratory affections, External parasites (Trichophytosis, mange, lousiness), and other worm parasites of no significance. The conditions were met with either alone or in various combinations. Among these diseases, however, it was observed that Ascariasis was very common amongst calves under 3 months of age and that its incidence in calves over the age of three months was very negligible.

Coccidiosis was less frequent than Ascariasis during this age period but its incidence was greater amongst white calves (*Bos taurus*) than in buffalo calves, (*Bos bubalis*;) during this age period, there was only one solitary case of a mixed infestation of Ascariasis and Coccidiosis in a white calf and two cases in buffalo calves.

TABLE I

Total Incidence

Buffalo Calves (<i>Bos bubalis</i>).			White Calves (<i>Bos taurus</i>).		
Ascaris vitulorum.	Coccidiosis.	A. vitulorum & Coccidiosis.	Ascaris vitulorum	Coccidiosis.	A. vitulorum & Coccidiosis
30	2	2	8	9	1

For a period of one year from November 1946 to October 1947, work was directed to a careful study of Ascariasis and Coccidiosis with regard to their incidence-rate in calves under three months of age. The following table details a summary of these observations.

TABLE II

Age incidence of infection with *Ascaris vitulorum* and/or Coccidiosis in calves from birth to 3 months.

Buffalo Calves (<i>Bos bubalis</i>).				White calves (<i>Bos taurus</i>)		
	Ascaris vitulorum.	Cocci- diosis	A. vit. & Coccidiosis.	Ascaris vitulorum.	Coccidiosis.	A. vit. & Coccidiosis.
Birth to 20 days.	—	—	—	—	—	—
21-30 days.	3	—	—	—	—	—
31-40 days.	21	—	2	4	1	—
41-50 days.	5	2	—	1	1	—
51-60 days.	—	—	—	—	—	—
61-70 days.	—	—	—	—	3	1
71-80 days.	—	—	—	—	2	—
81-90 days.	1	—	—	3	3	—
Total,	30	2	2	8	9	1

Calves were considered positive for these infections when faecal examination revealed eggs of *Ascaris vitulorum* or Oocysts of Coccidia. Many cases were positive for *Ascaris vitulorum* even on the first day of attendance at the hospital, but that did not mean that it was the earliest period when the worms commenced to lay their eggs. As is well known, the client seeks veterinary aid only when definite clinical signs of illness appear and this is only sometimes after the worms had become mature and started laying eggs. Even under these conditions, the earliest age when an infected buffalo calf was brought for examination was when it was 24 days old. Positive findings for eggs of *A. vitulorum* were the greatest - both in *Bos bubalis* and *Bos taurus* - from 31 to 40 days. It is quite likely that those calves were harbouring these worms as adults even a week or more previously.

Observations of Ransom and Foster (1920) in experiments with *Ascaris* in the pig, and those of Epstein (1892) in experiments on *Ascaris lumbricoides* in human subjects showed that it required about 2½ months for the complete development of these parasites after infection of the host. Wetzel and Einigk (1938) reported a period of 81 days for the development of *Ascaris equorum* in the foal. According to Griffiths (1922), in South Central Africa (Portuguese East Africa, Nysaland, Northern Rhodesia and Southern parts of Tanganyika territory) gross infestations by *Ascaris vitulorum* of young calves are of common occurrence, and in untreated calves the rate of mortality may be very high. The mortality from this cause is confined to animals between 10 days and 6 weeks of age. Fully mature species of male and female *Ascaris vitulorum* have been collected by him from calves that died between the 10th and 14th day after birth, as many as 40-120 specimens of the parasite being found in the stomach and intestines in each case. Immature forms up to 5 inches in length have been collected from animals that died between the 4th and 6th day after birth. All these findings go to prove that prenatal infection is the more frequent with *Ascaris vitulorum*.

Further, the low incidence of Ascariasis amongst calves of over 3 months of age, and its conspicuous absence in adults, whose alimentary tract is probably not a suitable habitat, seems to point to the fact that, in nature, either prenatal infection, or infection during the first two weeks of life, is probably the rule. That older calves develop an age-immunity to resist *Ascaris* infection can be advanced from incidence figures.

Workers have proved that vitamin deficiency lowers resistance to helminthic infestations and that diets deficient in vitamin A increased the susceptibility of pigs to pig strain of *Ascaris lumbricoides*, as well as to the human strain, which generally fails to mature in pigs. Most probably the first week in the life of a calf is a critical period with the greatest susceptibility for infections with *Ascaris vitulorum*. At that period its reserve of vitamin A is lowest and it will be some time before sufficient amount is stored by the ingestion of colostrum. It is obvious that the denial of colostrum to a new born calf renders it all the more susceptible for *Ascaris* infection.

Acknowledgment

The author is greatly indebted to Francis Joseph, G.M.V.C., Lecturer in Animal Hygiene, Agricultural College, Coimbatore, for facilities generously provided in making these observations.

REFERENCES

- Epstein, Alois (1892). Quoted by Ransom and Foster (1920).
 Griffiths, J. A. (1922). *Veterinary Journal*, 29, pp. 478-481.
 Ransom and Foster (1920) *U.S.A. Dept. Agri. Bull. No. 817, May 12, 1920.*
 Wetzel R, and Enigk, K. (1938) *Tier Wschr*, 46, 806.

Association News

BOMBAY VETERINARY MEDICAL ASSOCIATION

Proceedings of the 27th Conference of the Bombay Veterinary Medical Association held on 14th and 15th April 1949, at the Bombay Veterinary College, Parel, Bombay

The Conference commenced at 4 P.M., on 14th April 1949, in the Medicine lecture theatre of the Bombay Veterinary College. A large number of members, some of the invited guests from the city and the students of the Bombay Veterinary College attended the Conference. The chief guest Hon. Dr. M.D.D. Gilder B.A., M.D., F.R.C.S., Minister for Health and Public Works, Government of Bombay, arrived punctually at 4 P.M. to inaugurate the Conference. He was received by the President and the members of the Managing Committee. After formal introductions, he was conducted to the dais amidst cheers. Dr. S. R. Chadha B.Sc., M.R.C.V.S., Principal, Bombay Veterinary College welcomed the chief guest and the delegates. (Welcome Speech, Appendix A). The Honorary Secretary Dr. S. G. Kshirsagar then read out the letters conveying messages of success and good wishes to the Conference and presented the Annual Report for the year 1948-49. (Appendix B)

Messages wishing success to the Conference were received from the following persons :—

Hon Shri. B. G. Kher, Premier, Government of Bombay, Sir Datar Singh, Vice Chairman, I.C.A.R., Ministry of Agriculture, Government of India, Delhi, Mr. M. Moheydeen, M.R.C.V.S., Director of Veterinary Services, Sind, Karachi, Mr. P. Sreenivas Rao, G.M.V.C., Editor, *Indian Veterinary Journal*, Madras. Dr. J.P. Pereira, G.B.V.C. Superintendent of Markets, Bombay Municipality, Dr. E.R. Kulkarni, G.B.V.C., Retired Deputy Director, C.V.D., Bombay, Dr. M.K. Garudachar, G.B.V.C., Retired Disease Investigation Officer, Bombay, Dr. B.K. Salunke, G.B.V.C., Veterinary Surgeon, Akola, Dr. K.L. Shiggaon, G.B.V.C., Lecturer, Stockmen's Course, Dharwar, and Dr. I.I. Nagamia, G.B.V.C., Veterinary Surgeon on Famine duty, Broach.

The President, Dr. D. S. Laud, then delivered his presidential address. (Appendix C). This over he requested the Hon. Dr. M. D. D. Gilder to declare the Conference open which he did in a short speech. At the outset of his speech he agreed that there was a necessity for advanced and specialised training in different branches of Veterinary Science, though he explicitly discouraged the trend of people going to foreign countries simply for obtaining foreign degrees or diplomas in Veterinary Science. He pointed out that there was a time when

medical practitioners who went abroad for advanced training had to undergo training initially in the basic subjects which they had already completed before proceeding to foreign countries. This, he said, was nothing less than repetition of subjects and amounted to waste of energy and time. In his opinion, after prolonged and continuous efforts the medical profession in India stands almost very nearly self sufficient to-day which is the result of medical men having received advanced training in different branches of medical science in foreign Universities.

He urged the veterinarians not to depend upon Government for help of every kind in order to improve their condition but to stand on their own legs and nurse the profession so as to make it self sufficient in all respects.

He dwelt on the general disinclination of the urban people to go to rural areas for giving benefit of their knowledge and services to the villagers. He quoted as an example the case of Nurses who are born and educated in cities and who show unwillingness to go and live in villages after getting duly qualified from City Hospitals. To overcome such difficulties he advocated selection of candidates from local areas where their services are contemplated to be utilised and train them in the nearest suitable Hospital and send them back to their native places so that they could render medical aid to that locality. He attributed this reluctance to serve in villages, as due to various attractions of City life with which most of the City dwellers are unwilling to part with after once they have become a victim to such life.

He also dwelt upon the average longevity of life of Indians which is surprisingly short. He therefore expressed the view that educational courses should not be very lengthy and need not occupy time which will take away the precious period of a young man's life. He stated that he was of the opinion that if possible the present medical courses also should be curtailed to certain extent and advised the same for veterinary courses.

Concluding, Hon. Dr. Gilder expressed that there should not be any difference of opinion regarding the location of the Veterinary College so long as it remains a first rate College with a first rate hospital attached to it.

Dr. L. Sahai M.Sc., M.R.C.V.S., Director of Animal Husbandry and Veterinary Service, Bombay Province, then thanked the chief guest on behalf of the Association, and dwelt on some of the points that were touched by the guest of honour. He referred to the acute shortage of the personnel in Veterinary Department which compelled him to refuse even a few days leave to the members of the department. He attributed this shortage to poor prospects and pay given to the Veterinary Graduates; However he expressed that the matter of the revision of pay and scales of the Veterinary Assistant Surgeons is being seriously considered by the Government. He also added that in spite of new dispensaries being opened the problem of manning them with Veterinary Graduates was as acute as ever.

He suggested the setting up of Central Council for the Indian Union to advise and guide the Provinces on matters of veterinary education and profession. This he hoped will bring uniformity and integrity in the sphere of veterinary activities in all Provinces.

The function of the day terminated with "*Vande Mataram*". The members reassembled in the same hall after tea, when certain resolutions were put forth for the subject Committee's discussion.

The following members attended the Conference:—Drs. 1. A. G. Shende, 2. Victor Perian, 3. C.S. Balakrishnan, 4. K. R.S. Aiyar, 5. M.N. Ronghe, 6. T. S. Chiragia, 7. V. V. Nabar, 8. Z. J. Kalal, 9. P. R. Dhake, 10. B.G. Waghmare, 11. L.S. Hiregoudar, 12. A.G. Bhagwat, 13. S.P. Phake, 14. J. M. Desai, 15. V.B. Kharate, 16. B.M. Phatarphod, 17. B.L. Purohit, 18. W. H. Patwardhan, 19. D. R. Mudholkar, 20. V. N. Vaishnav, 21. G. K. Bhat, 22. M. A. Merchant, 23. R. H. Uttanwalla, 24. M. S. Salvi, 25. N. D. Dhakmarwalla, 26. F. S. Khambata, 27. T. G. Desai, 28. S. Rammohan Rao, 29. R. M. Kalapesi, 30. V. N. Kulkarni, 31. S. Hattangady, 32. P.G. Date, 33. P.G. Joshi, 34. T.R. Khaladkar, 35. G.R. Phatak, 36. M. H. Bhat, 37. S. S. Patkar, 38. N. I. Chopda, 39. C. A. Shah, 40. M. H. Nagamia, 41. G. A. Hardikar, 42. D. T. Parnaik, 43. C.R. Sane, 44. K. R. Alur, 45. V. B. Desai, 46. S. L. Manjrekar, 47. V. B. Kulkarni, 48. S. R. Kulkarni, 49. Shankar S. Naik, 50. D. G. Bendigeri, 51. S. J. Khambete, 52. B. G. Behere, 53. N. S. Kolte, 54. G. R. Murkibhavi, 55. R. K. Raikar, 56. K. V. Divekar, 57. J. G. Ghoghale, 58. D.R. Gokhale, 59. R. G. Dharwadkar, 60. B. T. Chitre, 61. G. K. Katre, 62. D.B. Khole, 63. R. G. Abhyankar, 64. D. S. Gadgil, 65. S. K. Deshpande, 66. S. L. Deshpande, 67. K.L. Patil, 68. G.H. Joshi, 69. S. D. Lingayat, 70. P. H. Abhyankar, 71. D. B. Doerukhakar, 72. J. Unnrakar, 73. V. S. Revandikar, 74. S. G. Kshirsagar, 75. M. R. Redkar, 76. S. R. Chadha, 77. V. R. Phadke, 78. R. N. Naik, 79. D.S. Laud, 80. N.H. Laxmeshwar, 81. K.B. Nair, 82. M.S. Vyas, 83. A.E. Kulkarni, 84. S.G. Dixit, 85. D.R. Chvan, 86. L. Sahai.

15th April 1949.

On the second day the proceedings started at 8-30, in the morning. The following papers were read in the Conference and an interesting and instructive discussion took place over these papers.—

1. Animals and Man—Part I:—By Prof. F. S. Khambata, M.Sc., G.B.V.C., Bombay Veterinary College.
2. Single dose prophylactic vaccination of dogs against Rabies:—By Lt. Col. J. R. Dogra, M.D., Haffkin Institute, Bombay.
3. Pasteurella invasion in the blood circulation of animals and diagnosis of Haemorrhagic Septicaemia:—By Prof. R. N. Naik, G.B.V.C., Vice-Principal and Bacteriologist, Bombay Veterinary College.

4. The Veterinary Department and Leather Industries :—By S. Raja, Superintendent, Bandra Tanning Institute, Bombay.
5. A case of *Nanomelus* in a calf :—By Dr. G.R. Murkibhavi, G.B.V.C., Lecturer, Bombay Veterinary College.
6. Fallen hides with reference to rural areas:—By Dr. S.G. Kshirsagar, G.B.V.C., Lecturer, Bombay Veterinary College.
7. A Research into Indian City Milk—Chemical and Bacteriological examination :—By Prof. R.N. Naik, G.B.V.C., Vice-Principal and Bacteriologist, Bombay Veterinary College.
8. Brucella Abortus Bang Disease in a Bull :—By Dr. K. V. Divekar, G.B.V.C., Veterinary Surgeon, Nasik.
9. Haemotherapy in Corneal Opacity :—By Dr. K. V. Divekar, G.B.V.C., Veterinary Surgeon, Nasik.

The members dispersed, at 1 p.m. to meet again at 2 p.m. Some of the remaining papers were then read and discussed. Dr. L. Sahai M.Sc., M.R.C.V.S., presided over these deliberations. He concluded the reading of the professional papers with his critical review and masterly evaluation of their scientific value.

From 2-30 p.m. onwards the open session started. The following resolutions were discussed and adopted by the General Body, during the session.

RESOLUTIONS

1. This house deeply mourns the sad and untimely death of the Father of the Nation, Mahatma Gandhi on 30th January 1948. The sorrow is too great to be expressed in words.
2. This house deeply mourns the irreparable loss caused by the death of Shrimati Sarojini Naidu, the Governor of United Provinces and a beloved leader of the people during the fight for freedom.
3. This house deeply mourns the sad and untimely death of Dr. G. D. Bhalerao, the well-known scientist and the former officiating Director of the Indian Veterinary Research Institute, Mukteshwar. In his death the Veterinary profession has lost a man who though a non-Veterinarian has made admirable contribution to Veterinary Science.
4. This house sympathises with the family of Dr. J. M. C. Rebello in their bereavement caused by the sad death of Dr. Rebello on 13-12-48.
5. This house deeply mourns the loss of Dr. K. Kailasam Aiyar a Graduate of this college and a distinguished Veterinarian and sympathises with his family in their bereavement.
6. This house deeply mourns the loss of Dr. C. N. Desai, Retired Deputy Director, Civil Veterinary Department, Bombay Province, and sympathises with his family in their bereavement.
7. This house records its strong resentment and utter disappointment at the attitude of the authorities concerned shown at the time of opening of the

Arey Milk Colony when the Veterinarians of this city were entirely forgotten inspite of the close cooperation given to them by the Veterinary department, though the members of the medical profession were invited.

8. This house urges the Government of Bombay to make applicable to the Government Servants of the veterinary department, such concessions as allowances of Privilege Ticket Orders in travelling, and gratuities to the families of those Government Servants dying while in service or in the event of death immediately after retirement from service as is laid down in the Central Pay Commissions recommendations.

9. This house reiterates its faith in the resolution passed last year and urges the Government of Bombay to reconsider their decision regarding the need for foreign education in veterinary science. This house requests the Government to select suitable veterinary graduates and send them abroad for training in different specialised branches of veterinary science as no such facilities exist in India at present.

10. This house views with deep regret that, in spite of the fact that the Livestock department has been amalgamated with the Veterinary department and the management of Livestock has been accepted as a function of the veterinary department, no veterinary graduates have so far been appointed to posts in Livestock department which still remains manned by the Agricultural graduates. The house therefore requests the Government to rectify this as early as possible by atleast considering the claims of the veterinary graduates in future appointments of this kind.

11. Presuming that the Government is reconsidering the question of improving the pay scales of the veterinary surgeons, this house requests the Government to remove entirely any invidious distinction, in matters of pay scales, between graduates of the Bombay Veterinary College who have undergone different periods of training with different minimum qualifications. Since all are appointed to the same post of the Veterinary Assistant Surgeons, irrespective of their qualifications, there is absolutely no justification for making any distinction between the old, the new diploma holders and degree holders for any purpose.

12. This house desires to bring to the notice of the Government that a dual control on the Premium Bulls and such other animals maintained by the Government which are in charge of the cattle-breeding inspectors or Field Kamgars and only referred to Veterinary Surgeons for immunization is wasteful and unproductive. This house therefore urges that such a dual control should be discouraged and the animals should be left entirely in charge of the local veterinary officers for all purposes.

13. Resolved that a sub-committee be appointed to deal with the question of the Registration of Veterinary Graduates in this province and to make suitable recommendations to the Government in the matter of legalising veterinary practice on the same footing as medical practice. The committee should consist of Dr. D. S. Laud, Dr. S. R. Chadha, Dr. R. N. Naik, Dr. C. S. Balakrishnan, and Dr. G. R. Murkibhavi.

14. Resolved that Government's attention be drawn to the statements made in the administrative enquiry committee's report which was based on scanty information regarding the functions of this department and was conspicuous by its not having consulted a single veterinary official or non-official in this province before preparing this report.

15. This house recommends that the Veterinary Assistant Surgeons should be classified as B.V.S. Class 3, as is obtainable in case of B.M.S. Class 3 who are Medical Officers in charge of dispensaries.

16. This house recommends to the Government of Bombay that they should reconsider and reverse their decision to stop Racing from 1953.

In support of the Resolution No. 16 regarding the "Abolition of Horse Racing" Dr. C. S. Balakrishnan, who proposed the resolution, advanced the following points :—

(1) That Racing is indispensable for the existence and scientific development of Horse breeding, whatever the purpose for which the horse is bred.

(2) The extinction of the Indian Horse Breeding Industry consequent on the stoppage of Racing would have serious repercussions of Nation-wide importance.

The Indian Army, we understand, again requires horses in large numbers. Biological Institutions engaged in the production of protective sera also badly need a continuous and large supply of horses.

Without an Indigenous Horse Breeding Industry, the horse requirements of both the Army and Public Health institutes of the country will have to depend entirely upon foreign import.

(3) At present India's Agricultural Economy is made to depend on cattle alone. This amounts to putting all one's eggs in one basket. The incorporation of the horse into this economy would remove the danger of dependence on only one unit and at the same time bring about incalculable benefit to the country.

(4) The only undesirable aspect about Racing is the gambling connected with it. But the volume of such gambling, which is fully controlled and open, is insignificant in comparison with the enormous volume of uncontrolled gambling in every other walk of life.

The abolition of racing cannot achieve any worthwhile object as gambling will go on as before and the Race Course gambling will only be shifted into other channels.

The figures both of the number of people that gamble on the Race Course and likewise the amounts gambled are too small to be set against the total destruction of Horse Breeding and its grave consequences.

Lastly he added that this association was in complete agreement with the Memoranda submitted to the Government by the National Horse Breeding and Show Society and expressed its full support to that Memoranda.

The following office bearers were elected unanimously for the year 1949 onwards :—

Dr. D. S. Laud	...	<i>President</i>
" G. R. Murkibhavi	}	...
" M. H. Nagamia		
" S. R. Chadha	...	<i>Treasurer</i>
" P. G. Date	}	...
" S. J. Khambete		
" G. R. Phatak	}	...
" N. I. Chopda		
" C. S. Balakrishnan		
" M. R. Redkar		
" K. V. Divekar		

The transactions ended with a vote of thanks to all the individuals who contributed towards the success of the conference.

(APPENDIX A.)

WELCOME SPEECH

BY

S. R. CHADHA. B.Sc., M.R.C.V.S.,

Principal, Bombay Veterinary College.

Hon. Dr. Gilder, Mr. Sahai and gentlemen,

I have a very pleasant duty to perform this afternoon and that is to welcome you all to this Conference, on behalf of the College and the Bombay Veterinary Medical Association. I know that most of you have come over here from long distances and leaving your important engagements. Your presence here shows the affection you have for the Association and I have no doubt, therefore, that, when we have such well-wishers, our Conference will be a great success. More so because we will be having the benefit of the presence of our Director, particularly when we will be discussing the technical subjects. For to-day's function, we are really fortunate in having the Hon. Dr. M.D.D. Gilder, Minister for Health and Public Works, Government of Bombay, as our Guest of Honour. Dr. Gilder is known to us all as a Minister in the cabinet, but it would not be out of place to recollect his valuable services and sacrifices rendered to our country.

The Hon. Dr. Gilder had a brilliant career as medical practitioner. He has the unique distinction of being a Scientist, a Professor, and a successful Politician. He has worked in various capacities in Medical Colleges and Hospitals and has to his credit an admirable war service as a major in I.M.S. during the first world war.

He is a reformer in religious sphere also, as proved by his introduction of the Parsee Religious and Charitable Trustee Bill, as a member of the Bombay Legislature, as early as 1931.

He gave up his lucrative practice in response to the country's call, participated in the civil disobedience movement, and courted jail for his political convictions and activities. Being a Heart Specialist of great fame, he attended upon Mahatma Gandiji several times during his illness. As a member of the Senate of the Bombay University and as the President of the Bombay Medical Union for several years, he was responsible for several improvements in the medical profession.

I admit that we have got very close connection with the agricultural department, but, after we qualify, we have many subjects in common with the medical science and, if the veterinary course is to be amalgamated with any other subject, it should be with the medical college and not with the agricultural college. We can then study common subjects such as Physiology, principles of general Medicine and, Surgery, general Pathology and Bacteriology and Histology etc.

Veterinarians are equally responsible, again along with the medical profession, for maintaining a high standard of Public Health and, if there is more collaboration between these two departments, it would certainly result in eradication of diseases in men and animals, better health for both, thus making them capable of more work resulting in more food which is so badly needed.

It is heard that the Government is thinking of reducing the present curriculum of the Veterinary Education in order to recruit more hands. I really doubt whether reducing the standard of veterinary education in this province would be of any potential benefit to achieve this object. After continued strenuous efforts for several years in the past, we have recently attained a high standard of veterinary education, whereby, instead of a Diploma, the graduates of the College now qualify for B.Sc. (Vet) of the University of Bombay. In recognition of this high standard of veterinary education in this province, therefore, the authorities of the Royal College of Veterinary Surgeons, London, have agreed to give maximum concessions, to the graduates of the Bombay Veterinary College, in that they will be directly admitted in the final year of the M.R.C.V.S. studies. For the same reason the Army have agreed to offer direct King's Commission to our graduates with University degree which privilege was restricted to M.R.C.V.S. in the past. In order to attract suitable young men to take up this profession, I would therefore suggest that the pay scales in the Civil Veterinary Department should be suitably revised.

Moreover in a free country like ours, it is essential to maintain a proper standard of education parallel to that of foreign countries as import and export is an important concern. Unlike Medical and Engineering, Veterinary Science is now developing but we have not got adequate facilities for advanced and specialised training in India. It is very essential, therefore, that we must send our graduates to other countries for advanced training in different branches of veterinary science, so that on return they should be in a position to do specialised type of work and also help in producing graduates with higher standard of education.

I must also emphasise about having a separate Faculty for the Veterinary education in the University which, in my opinion, is absolutely necessary for the progress of veterinary education on right lines.

In the end, I would say that a decent remuneration and proper status for the veterinary officers will always attract young people to take up this noble profession.

Gentlemen, I thank you all for giving me a patient hearing.

(APPENDIX B.)

SECRETARY'S REPORT

Honourable Dr. Gilder, distinguished guests, professional brothers and my student friends,

It gives me great pleasure to submit before you the report of the working of the Association for the period of the last 18 months from 8-8-47 to 15-4-49 during which I chanced to be the Hon. Secretary. Last time we met in an Extraordinary Conference in October 1947. In the routine course, we were expected to meet again in December last. But we could not, and had to postpone till this day. To-day we are singularly fortunate in having Dr. Gilder amongst us, when we have assembled here to ponder over our achievements and our handicaps.

This Association was founded in 1921 as Bombay Veterinary Graduates' Association, and the membership was restricted to Graduates of Bombay Veterinary College. Later it was found necessary to regard any Veterinary Graduate entitled to the membership and as such an amendment to original rules was made in 1929, with the idea of fostering comradeship. In the year 1931, the Association was rechristened as Bombay Veterinary Medical Association. The Association came into existence for achieving simple primary benefits for veterinary profession such as fraternity, and unity amongst veterinarians, raising their social status by remedying the problems affecting their interest, and last, but not least, the diffusion of knowledge and advancement on professional matters of mutual help and benefits. I am sure I will not be regarded as conceited if I say that aiming at these objects the Association has progressed a great deal, and there is no room for slightest disappointment. The Association was very fortunate to register the goodwill of enlightened distinguished persons, both official and non-official, who have graced our functions and presided and encouraged the Association to work with valour and vigour. Our veterans, to name a few, Khansaheb N. D. Dhakmarwalla, Rao Bahadur V. R. Phadke, Dr. D. S. Laud are still enthusiastically at the helm. The dynamic strength so gathered will always be sufficient to encourage us to face any unprecedented turmoil.

During the last year and a half, the Association had to fish in disturbed waters. Some fundamental differences of opinions have cropped up, and the Association had to impress on the Government about the right way of approach. Even at present, there are two burning questions before them and I am afraid they have still not found solution for both of them. The questions are (i) Veterinary education and (ii) the role of veterinarians. The Managing Committee, with the greatest alertness, tried to help the Government to find out a solution for both the problems. In the opinion of the Committee, the standard of Veterinary education evolved at the Bombay Veterinary College is of proper requirement for a veterinary surgeon and the province can easily maintain the same standard, provided the veterinarian is allowed to perform his full role in

matters related to animal health and disease. Our neighbouring provinces have realised this and have acted accordingly. The Animal Husbandry Wing Committee in their meeting in Mysore in February last, have also recommended the same. But let me pass over this point, leaving it to the President to deal it elaborately before the house explaining the rational attitude taken by us.

Dealing with the resolutions passed in the last Conference, I can give the following account.

Resolution 2.—Dealing with amalgamation of the department, the Government replied us on 24th December 1947 that

- (a) It is not the intention of the Government to abolish the Veterinary department. Under the reorganisation plan, this department forms a separate section under the Director of Animal Husbandry and Veterinary Science and its work and personnel are in no way affected.
- (b) The veterinary, livestock, dairy, sheep and poultry section have all been brought under the unified control of the Director of Animal Husbandry and Veterinary Science, and there is thus no question of amalgamation of one department with the other, as they function as separate sections under one officer who controls and co-ordinates their activities.

Organisations in other province are duly examined by the Government at the time of reorganisation.

Resolution 3. Dealing with deputation for foreign training, a reply was received that the Government had already decided not to depute any more officers for training overseas. The Managing Committee took cognizance of the reply and the Government was informed of the glaring facts, which have clearly been noticed even by the Administrative Enquiry Committee 1948, that "this department seems to be pre-eminently one in which foreign training is desirable." In the light of the above decision of the Government, it is surprising to see persons of other sections in Animal Husbandry and Agriculture are still being recruited for the same. We fail to understand the difference. The Committee in the end have again emphasised for higher training for specialisation without which the department will always feel the dearth of highly qualified suitable persons.

Resolution 4. For change in designation from Veterinary Assistant to Veterinary Officer, I/C Veterinary Dispensary, the Director held fast to the decision of the Government and was not in favour of the change proposed as the immediate superior officers of Veterinary Assistant Surgeons are designated as Divisional Veterinary Officers.

Resolution 5. Shifting of the College.—The Honourable Minister for Agriculture and Veterinary in the interview was plain enough to say that there was a great difficulty in acquiring land at Poona, for establishing a Veterinary

College, and, in spite of the decision in favour of shifting, he was not sure of seeing the way through. Consequently he has issued orders to the head of the department to propose scheme for the expansions of the College at the present site.

Resolution 6. Recruitment to Gazetted Posts.—The Director has informed this Association that he always recommends suitable members from the department for recruitment to gazetted posts through Public Service Commission.

Resolution 7. Pay scales etc.—It was indeed a very vexing question and, in my humble opinion, I can say that the Committee strived utmost to bring home facts to the Government that a great injustice has been done to the subordinate veterinary establishment in respect of pay scales. I would rather prefer to be more elaborate in this connection, as it is very vital and very personal to many of the members. The resolution with covering letter was forwarded to the Government by November 1947. The revised pay scales were out in January 1948. The President immediately referred the unsatisfactory nature of revision to the Government, with a reference to pay scales of allied sections and departments. Without doubt, a great disparity was, and still is, seen in emoluments paid to subordinate officers of Agriculture and Veterinary Departments. This was followed by references to pay scales of Veterinary Assistant Surgeons in other provinces. All told, it was a convincing fact that the Veterinary Assistant Surgeons of this province are not paid according to their worth. The Minister for Agriculture at the time of interview on 31.1.49 remarked that the matter was still under consideration and I hope it will meet with a sympathetic decision both for the benefit of the veterinarians and the vast cattle population whose custodians they are pledged to be.

Resolution 8. Preferential treatment to war-retained personnel.—The instances of such preferential treatment were quoted as per letter No. 185. It was later seen that the department was not keen to give benefits to the war returned candidates other than those that are offered by the Government as per G.R.P. & S.D. No. 4083/34-12, dated 6th May 1946, which otherwise was a clear injustice to the senior members of the Department.

Resolution dealing with the registration of Veterinary Surgeons has not fructified and I think the Association should form a Sub-Committee to go into details for considering the registration in detail.

Resolution for re-employment of retired persons (Veterinary Assistant Surgeons) was supported by the Government and the Director and such re-employments are being given in view of the paucity of Veterinary Assistant Surgeons in the department.

The Managing Committee in its meeting has stressed on two other points worth mentioning. One was the omission of Veterinary Degree or Diploma holders from the eligibility for applying for posts in dairy and livestock section of Animal Husbandry. It occurred in December 1947. The Government

subsequently modified their further advertisements recognising Veterinary Degree or Diploma with specialised training as suitable qualifications for applying for such posts.

The other point was for sponsoring horse breeding in tracts where formerly some studs were maintained. The Government have preferred to keep quiet and in the interview the Minister for Agriculture and Veterinary showed disinclination to take any step in that direction.

Proposals for propaganda rural broadcasts, by Veterinarians on Veterinary matters, have been finalised and a scheme to that effect is on hand with the head of the Department.

House rent to Veterinary Assistant Surgeons which needs an adequate increase due to high cost of rent has been proposed and the replies are awaited. The Bombay Municipality was requested to send their scholars for Veterinary education to meet shortage of personnel on the lines of the states scholar but it seems the corporation have tried to solve their problems by offering increased rates of pay to Veterinary Surgeons who have undergone veterinary courses at their own cost.

This is, in short, the gist of the work turned out during the short span of a year and a half. I, as the Hon. Secretary, have done my humble mite which would not have been possible had I not mustered the advice and confidence of the President and the members of the Managing Committee. I frankly admit the shortcomings especially if they are due to faulty directives taken by me in the working of the Association of this type which is pledged to do good to all. I would like to request the members to regard them as instances of human weakness and I have no doubt that the members will excuse me for the same with a broad heart.

Our Association has gathered more strength in memberships which is an addition of 17 to 194 already on the list.

Before concluding, I consider it my duty to express my gratitude to the President and the Members of the Managing Committee for the utmost cooperation they have given me in carrying out my work successfully. I cannot afford to forget the immense help the Joint Secretary, Mr. M. R. Redkar, gave me both in pen and thoughts. We were Joint Secretaries to the core and as such thanking him would in short mean thanking myself. I shall always prefer to carry his debt as a prize I have earned.

I thank you all for giving me this opportunity of serving the Association and through it my colleagues.

JAI HIND

S. G. KSHIRSAGAR,
Hon. Secretary.

(APPENDIX C)

PRESIDENTIAL ADDRESS

By

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

The Honourable Dr. Gilder, Gentlemen, professional brothers and students,

It gives me great pleasure to extend to you a most cordial and hearty welcome, on behalf of the members of the Bombay Veterinary Medical Association, to the 27th Annual Conference which is being held to-day. [We generally hold the annual session of our Conference in the month of December. Accordingly we should have held our Conference in December last. But we had agreed that our Conference should synchronise with the Diamond Jubilee Celebrations of the Bombay Veterinary College, which should have been held by the College authorities who have undertaken the task, in the month of December last. But as the Jubilee Celebrations of the College had been postponed and proposed to be held in December next, we thought it wise to hold our annual Conference now. It is also proposed to hold our next Conference along with the Diamond Jubilee Celebrations of the College in next December. We are also to request the All India Veterinary Conference to hold its Session in Bombay at that time.]

It may be recalled that this Association had to face many difficulties at every stage of its progress, but to day I am glad to mention that it has survived the blasts of adversity and has maintained its identity and utility. The credit goes to the members of the Association, who have so highly helped it to reach this stage. The Association is very much indebted to the sound advice and encouragement given, from time to time by enlightened and distinguished persons of high position and calibre who have in the past inaugurated our Conferences.

To-day we have in our midst a very distinguished guest Dr. M.D.D. Gilder, the Honourable Minister for Health and Public Works to the Government of Bombay. Dr. Gilder is a distinguished person of Science and Arts. He is a proud product of our Bombay University, having passed the Bachelor of Arts and Licentiate of Medicine and Surgery Examinations with great credit and high honour. To crown this glory he has obtained the highest degrees in Medicine and Surgery (both as a Physician and Surgeon) by being M. D. (London) and F.R.C.S. (England) among the first few Indians, who have obtained this double distinction. Further more he is a specialist in Heart Diseases. Such are the achievements of our honoured guest. We, therefore feel proud to have such a distinguished person to grace this evening and to spare us his valuable

time to give us the benefit of his scientific knowledge and advice in spite of the multifarious duties of his office as the Honourable Minister for Health and Public Works in the present Cabinet of the Bombay Government.

Dr. Chadha, the Principal of the Bombay Veterinary College, has already introduced our Chief Guest of this evening, and I fully associate with all that he has said about Dr. Gilder in his welcome speech. But suffice it to mention that I have known Dr. Gilder for sufficiently a very long time, since my service in the Bombay Municipality for nearly 35 years, when he was our Municipal Medical Examiner, a Physician of great repute in Bombay and last but not the least he has been one of the team of pioneers of Medical profession in Bombay, along with Dr. Jivraj N. Mehta to build up and foster, the two great Municipal Institutions of Bombay viz: the King Edward Memorial Hospital and the Gordhandas Sunderdas Medical College to the high standard of efficiency that they are to-day.

I need not go into the details of the activities of our Association. Mr. Kshirsagar, the energetic Secretary has fully narrated in brief the work done. However we have made a satisfactory progress during the year.

Now let me give you in brief, the history of our *Alumni*. Our College was established in 1886, as a premier Veterinary Institution with very high ambition of the late Dr. John Henry Steel the first Principal. Had his ambition been fulfilled our College would have been on equal footing with the Grant Medical College of Bombay since long and our Veterinary Service would have seen the light of better days and prospects. But unfortunately these high ideals did not materialise due to the policy of the die-hards of the British Bureaucracy, who were then in power and owing to the untimely death of Dr. Steel, the first Principal. In the year 1926, Matriculation was made the standard for admission to the College and from 1940 it was raised to Inter-Science 'B' medical group with three years course of advanced curriculum. Thereafter the College came to be affiliated in 1945 to the Bombay University with a Degree of B. Sc. in Veterinary Science, and the curriculum has been extended to four years. This is therefore the fourth year and the first batch of students who will pass out taking the University Degree will be in June of this year.

But while we have achieved this goal, we have been having very distressing news of the venue of Veterinary Education being shifted from Bombay to Poona. Further there is the proposal also of amending the present curriculum and lowering the standard of admission to Matriculation with a four years course for which the matter is under consideration of the University Advisory Committee sponsored by Government as stated to us

by Mr. M. P. Patil, the Honourable Minister for Agriculture, Veterinary and Forests, when some of our members along with myself had an interview with him at the Secretariat on 31-1-49.

In connection with the shifting of the College to Poona, the Bombay Veterinary Medical Association had submitted its views against the proposal in a representation made to the Government on the 18th September 1946. I need not go here through the merits of this representation as they have already appeared in my presidential speech at the last extraordinary Veterinary Conference held in this Hall on the 8th and 9th October 1947, (the proceedings of which have already been published in the *Indian Veterinary Journal* Vol. XXIV No 3) At the Conference the President and some of the members of our Association had with Hon. Mr. M.P. Patil, the Minister of Agriculture, Government gave assurance that the Bombay Veterinary Medical Association would be consulted before a final decision was taken. But it is regretful to mention that no such thing was done. But on the other hand, a reply was received from the Assistant Secretary to the Government of Bombay, Agriculture and Rural Development in reply to our letter No. 184 dated the 1st August 1947, that the Government have finally decided to move the Bombay Veterinary College from its present site at Parel to Poona. The Association then sent a further memorial on the 20th of September 1948, pertaining to the "Functions of the Veterinary Department and the utilisation of their services" to the Government. It is evident from a glance at the working of the Veterinary Department in other provinces, that our Province is the most reactionary and the policy is retrogressive, instead of being progressive. This is fully proved by the decision arrived at by the Government to shift the College, to reduce the course and to treat this profession as a very minor part of the Agricultural activities. It may be noted that in other provinces this department has full independent status and therefore unlimited scope in all affairs concerning animals. This is the only Government which somehow has been persuaded to treat animal science as a part and parcel of plant science. All progressive thoughts in the world and all educational institutions have constantly kept agricultural science limited to plants and veterinary science to animals.

On going through the reports of the Administrative Enquiry Committee for 1948, also it is found that some false impressions have been given regarding the scopes and functions of the Veterinary Department. This is not least surprising, since this Committee somehow did not find it convenient to call even a single witness from the members of the Veterinary profession, either an official or non-official. This Committee was of opinion that Animal Husbandry was so closely connected with general agricultural activity, that it must be placed in charge of agricultural officers at district level. However the Committee fortunately realised tha

there is a close connection between Animal Husbandry and the functions of the Veterinary Department, although the latter are in a way independent of normal agricultural activities. The two together i. e. the Animal Husbandry and the Veterinary Services might be placed under the control of a joint Director, while all the activities of the agricultural department should be under the undivided control of a single Director as before. The relation between the Director and the Joint Director would then be that the latter would be given full freedom of action with regard to the special functions in his charge, but his general activities would be integrated with the main department. For instance, while the Joint Director would control the Veterinary College, there should be close collaboration between it and the Agricultural College, so that the services of the staff of one College may be available to the other when needed. In short this means the amalgamation of the Veterinary College with the Poona Agricultural College; and the Veterinary Services as such would be integrated with the main department i.e. Agriculture. While the close connection between the Animal Husbandry and the function of the Veterinary Department would call for greater advancement of the Science and further utilisation of the talents of the Veterinary profession, in actual practice Government seems to be in a mood to consider the Animal Husbandry as more akin to Agriculture than to the Veterinary Science. But here let us for the matter of satisfaction of all concerned find out what is Veterinary Science and therefore the following definition as given in the Encyclopaedia Britannica will make interesting reading. "Veterinary Science is the branch of knowledge that deals with the anatomy of domesticated animals, their physiological and racial characteristics, their breeding, feeding and hygienic management, the pathology and the treatment of the diseases and injuries, their relation to man with regards to inner communicable maladies and to his use of their flesh and products". This definition is an elaborate one, coming from an authoritative international publication, and should be sufficient proof to decide the correct description, and dispel all doubts as to the Animal Husbandry being part and parcel of Veterinary Science and as such there is no person better than a Veterinary graduate to carry on the functions of Animal Husbandry operations and management of livestock. Then again it is idle to start any discussion all over once again. Sir Frank Ware, F.R.C.V.S., till recently the Animal Husbandry Commissioner with the Government of India who succeeded Sir A. Oliver, F.R.C.V.S., on the latter's retirement drove the nail hard and gave his opinion in the following words.—"In the subject of livestock production they (Veterinarians) require the help of Geneticists, Biochemists, Pure Scientists, who devoted their time to subjects like Helminthology, Entomology etc. To get a "Punch" into this question of livestock improvement they must have that "Centrally directed drive" and he could not see anybody who was going to be able to give that drive

except a Veterinary graduate". (*The Indian Veterinary Journal* Vol. XXIV, No. 6 of May 1948).

It may be interesting to record here in passing, for the information of the younger generation that Sir Frank Ware (then plain Mr. Ware) when drafted to the I. C. V. D. (later designated as I. V. S.) landed in the month of December 1907, and immediately took charge of the post of Vice-Principal at the Bombay Veterinary College. He used to teach equine operative surgery practicals and soundness to the 'C' class students and used to be in-charge of Horse Wards; while he taught handling of animals to the students in 'A' class in 1908. I personally remember him very well as I was then a student in 'C' class, who graduated from the College the same year. Sir Frank Ware did not stay long in Bombay, and was soon transferred to Madras, where he turned out to be an able administrator. He built and strengthened the Madras Veterinary Services, and brought it to efficiency. What was a loss to Bombay was a gain to Madras. What pay, prospects and several grades in the Veterinary Service, which Graduates are enjoying there, are the fruits of labour of Sir Frank Ware as Director of Veterinary Services of the Province.

With regards to the Veterinary education in this Province, the position has become so very peculiar, that any new entrant would naturally hesitate and well nigh turn back even after entering the College. This is amply proved by the Government not heeding to the representations made from the several quarters not to shift this progressive institution which has existed in Bombay for over 60 years, and trying to amalgamate it with the Poona Agricultural College. The two Sciences are so separate that any attempt to combine these two institutions will be disastrous to both. Even in the Indian Science Congress, the Veterinary Section is grouped with the medical section and come under one wing, as both are sister sciences interdependent upon one another in the field of progress and research (both Medical and Veterinary research). When it is seen that the smallest branch of any science is given full scope of expansion to-day, it is regretful to find that the Government is seriously considering steps at lowering the standard and permanently destroying the progress. Progress so far made, which if properly encouraged can bring prosperity to the nation. The present position of the Bombay Veterinary College is such that the Government neither gives it facilities for its expansion nor does it shift permanently and install it as an independent institution at any other place. This has resulted into suspicious and unhealthy atmosphere, which is most injurious to any educational institution from where the inspiration for the new entrants and the old comrades must originate. This state of stasis is a definite waste of time and energy apart from the waste of public money. It is for this reason our committee made the following concrete suggestions, aiming at

removing all doubts in the minds of the public as well as those who are in the profession and help Government to define its policy, which hitherto has been based on ill-informed sources.

1. The integrity of Veterinary Department should be maintained as such, and should be evidenced by an independent head of the department who should be responsible to the Minister.

2. Animal Husbandry should necessarily be considered as a part of Veterinary activities, and need not even be mentioned separately, i.e. the Director of Veterinary Services is automatically the authority controlling Animal Husbandry activity. The misconception that Animal Husbandry has anything to do with normal Agricultural activities should be removed even though the tradition in this province seems to have created a false impression which has no real basis.

3. The Bombay Veterinary College should not be shifted to Poona in view of the fact that the Government is not even sure of acquiring land there, for the College buildings and general facilities for such education are far from satisfactory. Simply shifting the College should not be treated as an ideal measure unless all that the College and the hospital have in Bombay can be provided for at the other place chosen. All these factors would mean a very heavy expenditure. It is doubtful whether the Government would be prepared to meet such heavy cost. It may be reiterated that there is enough space for expansion of the College in Bombay and suburbs and there is no real reason for shifting.

4. The Government is well aware of the fact, how the present standard of Veterinary education has been evolved and that it is now recognised internationally and by the Royal College of Veterinary Surgeons of Great Britain. To retard the steps at this stage by reducing the course and lowering the standard is a definite sign of degradation. Even ordinarily it will mean that the course so reduced will be regarded as a second rate and graduates of other Veterinary Colleges for example Madras will be regarded as highly qualified and a second rate importance will be given to the graduates of the Bombay Veterinary College. They may also be not eligible for direct Commissions in the Indian Army.

5. The shortage of the personnel in the Veterinary Department, of which the Government often complains can be viewed more systematically and with better understanding. The requirements of the profession are of two kinds, (a) Persons who can go from village to village for such work as castration and vaccination and first aid treatment to animals. (b) who can diagnose and treat diseases, render advice in animal breeding and in general are of ability to control the health of animal. The first can be met with by production of stockmen which the Government is already doing. Regarding the second there seems to be a lot of difference of opinion. These persons should be professional graduates on par with

medical graduates. They should possess such basic qualifications as would make them fit for tackling the rather complicated problems of animal health and research, for example the inspection of slaughter houses, management of cattle breeding farm, conducting dairy, and running dispensaries, tackling research in the districts and control of epidemics. They should be capable of undergoing higher courses of specialisation. This requirement can only be satisfied by full fledged graduates of at least five years professional training. It would be ruinous to produce cheap graduates, who will neither be capable of research nor can do very efficient field work. The right steps of having an efficient Veterinary service is to observe the policy of "Pay well and expect more and efficient work". Low payments invariably result into discontentment and indifference on the part of the servants and cannot really be enforced with benefit for any long period.

6. The normal activities of the Veterinary Department of this Province had been restricted in past to running veterinary dispensaries only. This is really speaking the minimum utilisation of the service since if opportunity is given, the department can independently take care of such activities as Animal Husbandry (Animal Breeding centres), conducting dairy farms, inspecting slaughter houses, hides and skins and other bye-products from the slaughter houses, inspection of markets and foodstuffs sold therein, management of poultry farm and various other activities. It is therefore requested that the Government should consult top-rank experienced veterinarians of this province and outside and get the real benefit of their knowledge instead of depending upon such advice that can be had indirectly, which might be ill based and have an idea of lowering the importance of one profession for the benefit of the other.

These reasons were put up by the Committee in the memorial sent to the Honourable Minister for Agriculture, on 20th September 1948, and they requested for an interview which was granted on 31st January 1949 when members consisting of myself Mr. Kshirsagar and Mr. Redkar, the Secretaries along with Mr. P. G. Date and R. G. Sathe and Mr. V. N. Kulkarni, attended the conference at the secretariat. Mr. M. P. Patil, the Honourable Minister, gave us to understand that he was firmly of opinion that the college be shifted to Poona where there is ample opportunity for study of Animal Husbandry, in the nearby districts. In his opinion Poona has rural bias and he thinks that a dairy attached to the Poona Agriculture College can be advantageously utilised for studies of dairying to the Veterinary students. Growing fodder crops can also be taught to them on the farms attached to the same College. The slaughter house of Poona though small can provide opportunities for studies of meat inspection. Apart from this he informed us the wish of the Government to see whether the Agriculture and the Veterinary courses can go simultaneously for the

first two years, and later by bifurcation to graduation. The Committee appointed by the University is working a curriculum for such a course. On both these principles we disagreed with the Honourable Minister. As regards shifting, only to get the advantages from farms attached to Agricultural College, Poona, we do not find any reason why such farms should not exist even in Bombay or for a Veterinary College to be shifted to any other place. As regards amalgamation of the courses we find nothing common with Agriculture and Veterinary except the subject Animal Husbandry. Even in basic sciences the aspects of and the emphasis given on the portions entirely differ from each other. The two courses even though they seem allied are technically altogether different. We therefore, requested the Government not to try this experiment which will neither be of benefit to Veterinary or Agricultural Science. As per information given by the Honourable Minister, we wrote to the University of Bombay requesting to inform us the panel of any such Committee appointed for modelling Veterinary education. The University in return informed us the panel of the Advisory Committee consisting of Dr. Uppal, Director of Agriculture, Dr. S. R. Chadha, Dr. K. B. Nair, Prof. Devnani, and the Director of Animal Husbandry, Bombay Province. Going further we came to know that this Committee was only asked to frame a syllabus for four years course of Veterinary graduation in which only the latter two years would be spent for pure Veterinary Science. We are afraid such a short cut, for economy and other reasons only known to the Government, will completely disrupt Veterinary profession and indirectly will be a great loss to cattle wealth. For the time being the difficulty of acquisition of land for the Veterinary College at Poona stands paramount and as a result the Honourable Minister has issued the instructions to the Principal, Bombay Veterinary College to put forth schemes for expansion of the College at the present site in Bombay.

With regard to the pay scales of the Veterinary Assistant Surgeons in the Government service I can say that they are very meagre. The Minister informed us that the matter is still under revision. He has asked the Director of Animal Husbandry and Veterinary Services for a scheme of revision of pay. Let us therefore hope that the Director will take into consideration the present hardship and put up a sound and a favourable scheme which will be beneficial to the graduates of this College already in Government service. We also hope that the prospects and pay will be attractive so that more and suitable students will be attracted to this profession.

Here I would like to quote a few extracts from the report of the Veterinary Sub-Committee appointed by the Government of India in 1943, in Veterinary education. In this report the Committee recommends the following two courses.

- (a) For Veterinary Assistant Surgeon, a three years' course with Matriculation as educational standard.
- (b) For the higher course, either (1) five years' course based on Matriculation, or (2) a four years' course based on Inter-Science (B. Group) standard.

The Education Committee at that time pointed out that, until such time as provinces in which the College had three years' course consider it practicable to raise the initial salary level, education may proceed on existing lines, but recommended that these provinces should institute as soon as possible the higher degree course in place of the present three years' course. The Committee further suggested that the Central Government may be asked to recommend to the Provincial Governments to raise the salary level for the graduates to that present in Punjab, so that such a course may be adopted in all these Colleges without delay. Madras, Bombay and Muttra Colleges have modelled their curriculum as per suggestions of the Committee and the ultimate result is the recognition of these Colleges as first rate Veterinary educational institutes.

Now let us examine the scales of pay sanctioned in East Punjab and Madras. In East Punjab, the scales of the Veterinary Surgeons is Rs. 100-10-150/20-200/10-300. The pay scales of Class II is Rs. 250-750, and Class I is Rs. 350-1200, with a selection grade from Rs. 1200-1500. In Madras the starting salary of Veterinary Assistant Surgeon is Rs. 120/-p. m. in the scale of Rs. 120-5-200-10-250, and the B. V. Sc. will start on Rs. 140/-p.m. Position equal to class II Officers, the scales are of Rs. 260-700 and Selection Grades from Rs. 800-1200.

Now we may compare these scales of pay with those given to the Veterinarians in the subordinate cadre in this Province. They are meagre. All this information along with number of posts has been collected and forwarded to the Government and the Director of Animal Husbandry to serve as a pointer in proposing revision of the scales.

Of late, the scope of work to the veterinarians has been considerably widened by the integration of Saurashtra, Kolhapur, Baroda and other native states in the Bombay Province. There should be greater consolidation of work and greater responsibility to be shouldered. We shall now have to look forward to our Government to make adequate provision in number and personnel of the staff required for Veterinary services with satisfactory emoluments in the grades as quoted from East Punjab and Madras. The Bombay Municipal Corporation has tackled this problem rather efficiently and it is hoped that the same may occur in the Province of Bombay. If the Government does this *i.e.* model the pay scale, then intelligent students in adequate numbers will be attracted to this profession with the result that, in

few years' time, there will be no dearth of personnel to man the Veterinary services, and the constant main complaint of dearth of personnel will once and forever be solved.

On this point as a matter of information, I would like to refer to the speech of Sri S.V. Mudaliar, G.M.V.C., Principal, Madras Veterinary College, and a chairman of the Reception Committee of the 8th Provincial Veterinary Conference of the Madras Veterinary Association, in which he has shown the steady progress of the admissions and the graduates produced from the Madras Veterinary College. Last year the admissions swelled up to about 100 including the candidates from Assam, Orissa, United Provinces, Mysore, Coorg etc; and this year the admission was about 100 including two lady students. The achievement of that College speaks for itself. The problem of Madras is in no way dissimilar to that of Bombay Province. What is needed is the reorientation of the policy of the Government towards Veterinary profession.

Now let me turn to the subject of the role of cattle wealth of India. As we are fully aware, India is essentially an agricultural country and the cattle are the backbone of agriculture. Nearly 80% of Indian rural population is agriculturist, for whom cattle is a matter of great importance. Thus cattle occupy a unique position in the rural economy of India, and therefore, has been an object of special care from time immemorial in this beloved country of ours. Our problems are of twofold nature; firstly, we need more milk and its product, to provide adequate diet to our people; and secondly, we need better healthy and hardy bullocks for our agricultural operations. Our country possesses one-third of total cattle population of the world. The 1941 census report gives the total bovine population of the unpartitioned India at 208.2 millions. As a result of partition it is our fair estimate that 30 million of cattle went to Pakistan. In spite of such a huge cattle population in India, we feel this deficit both in milk and cattle power. The main reason is that our country is essentially suffering from a food shortage, and the slow process of starvation to which our livestock is exposed is apparently evident from its unthrifty condition, poor production, stunted growth, late maturity and long intercalving periods. Thus we lose million tons of milk and quite a large amount of cattle power. What does this mean in terms of national health and production and, therefore, of national wealth? Do we realise this? As the matter stands at present, it is found that not more than 60% of the fodder required is available, and, as regards the total concentrates needed, only one-fourth can be obtained. The position of supply of milk is still worse. The figures give that 22 million tons of milk is produced every year in India. This production must be increased to 65 million tons, if we have to meet the minimum requirement of our people on the calculations at the rate of 1 lb. of milk per day per head of the population (8 ozs. milk and 8 ozs. in the form of milk products

like Ghee, Butter etc). Another 10 million tons are needed for the feeding of the calves. The present capita consumption in our country of milk is five to six ounces. (In Bombay 2½ ounces only). In comparison it is interesting to note that it is 40 ounces in Denmark, 45 ounces in Australia, 35 in the United States of America, and 39 ounces in Great Britain. This shows that our supply of milk per head is very poor in spite of our country having the largest cattle population in the world. The rearing of cattle in this country has to be carried out under a variety of adverse condition of climate and environment. The average cattle breeder is poor. He subsists on small fragmented holdings, the large majority of which are less than 5 acres, while the average size of his herd consists of only two or three animals as against 27 to 28 in countries like U. S. A. or England. These units are therefore uneconomical, and the individual owner by himself cannot introduce any appreciable improvement. If we consider the immensity of the task with the numerous complications, the solution is certainly not easy; but it is evident that we must make endeavours to improve our cattle by better feeding and better management. It is difficult problem to provide more fodder and concentrates for our cattle, for there is heavy pressure on land, with a serious competition between man and animal. In our planning to bridge the wide gulf between supply and demand with regards to the deficiency in cattle feed, the requirements of human beings must receive primary consideration. But, after a careful review of the position in respect of cultivation and the yield as the result of introduction of the latest scientific methods, it appears possible that, by readjustment of our programme of cropping, some extra feed can be made available for cattle. But it would be possible to meet these total requirements if the production of land can be increased by about 50%. It is therefore necessary to tap all other sources to supplement food for cattle.

The Honourable Mr. Jairamdas Doulatram, the Food Minister, Government of India, in his address at the opening of the All India 7th cattle show in New Delhi on 29th January 1948, summarised these sources as follows :—

1. Hay and silage-making out of the surplus grass which is available during monsoon should be practiced all over the country. There are 136 million acres of grazing land in India. Even though no precise data of grass yield is available, the limited information goes to show that the production is about 2 tons green per acre; at least one third of it can be easily preserved as hay or silage. All this now goes to waste.

2. A number of forest areas under Forest Department grow large quantities of grasses which may be turned into silage.

3. Crops known to improve the fertility of the soil and at the same time to increase the amount of fodder for example "*Bursem*" should be extensively grown, wherever possible.

4. Large quantities of oil cakes, at present entirely used for manurial purposes, can be conveniently turned into cattle feed. The same object will be served if some part of the cake is passed through cattle.

5. The Nutritional laboratories of the Indian Veterinary Research Institute have extensively explored possibilities of new sources of foodstuffs, and it has been shown that mango seed kernel, munj, ground nut husk, acacia pods, and bower seeds, are rich in feeding value and can be extensively used in cattle feed. The methods of their preservation and use have been described in detail in one of the issues of *Indian Farming*.

6. The deficiency in rice straw, if corrected by the addition of bone ash, will increase the utility of this foodstuff.

7. A great deal can be accomplished if the mixed farming practices are more widely adopted.

8. Thirty percent of the waste can be saved if all the fodder is chaffed before being fed.

9. More use should be made of fodder bearing trees, as their leaves and pods provide excellent fodder.

10. Fish meal industry should be developed so that more of highly concentrated protein food will be available.

With regards to cattle breeding and improvement, he stated that a number of Government farms are producing pedigree bulls of the various breeds which will be distributed to the villages for improving the livestock. There are 45 such farms in India which annually issue 1868 bulls. Considering the nation's requirement the distribution is not even 1 per cent. Planned scientific breeding is therefore very essential for improvement of cattle. Mr. Jairamdas summarises that our efforts should be concentrated on the following lines:—

- (a) All bulls issued from farms should be located in a specially selected breeding tract and concentrated in a few villages, so that casualties and replacements are assured. From this area all other male stocks should be removed. In due course these "Key villages" would be in a position to supply better bred animals for general distribution.
- (b) Efforts should be made to evolve dual purpose breeds, i.e. herds which would produce good working bullocks and also cows which will yield a fair amount of milk. Work in this direction is in progress on such breeds as Haryana and Hallikar. The Government of India are setting up a farm at Jabulpore to study this problem in great detail.

- (c) Artificial insemination which has proved successful in other countries is definitely of value in this country. Work done at the Indian Veterinary Research Institute has shown that a great deal can be achieved even under Indian conditions. Experimental centres recently set up have yielded very promising results. By the adoption of this method, pedigree bull shortage can be minimised.

He further expressed that the topical question of preservation of cattle and salvage of useful cattle, and their insurance, are all under examination of a Committee and it is hoped that the results would be before the public are long. This will, however, be possible if we realise that the cattle problem is not only a humanitarian one, but also involves health and wealth of our nation.

Thus let us follow the lead given by Mahatma Gandhi in solving the cattle problem and so do our duty in a small way in keeping alive our departed leader's memory in this land.

Since then, the Cattle Protection and Preservation Committee have made some recommendations which have been accepted by the Government of India. Mr. Jairamdas Daulatram, Minister for Food and Agriculture, in a statement to the Dominion Parliament, mentioned that the Committee recommended that slaughter of cattle was not desirable in India under any circumstances and that Cattle protection should be enforced by law. The prosperity of India to a very large extent depended on cattle and therefore cattle slaughter should be completely banned and simultaneous steps taken to improve cattle which were in a deplorable condition. To achieve this, the committee had suggested the following recommendations (as published in the Times of India of 25th March 1949).

- (1) First step should be to ban cattle slaughter of all useful animals other than animals over 14 years of age, and animals of any age permanently unable to work or breed owing to age, injury or deformity.
- (2) Unlicensed and unauthorised sale of cattle to be banned. It should also be made a cognisable offence under law.
- (3) The law of prohibiting slaughter of cattle should be enforced as early as possible, but, in any case, within two years of enactment of legislation, during which period necessary arrangements should be made for maintenance and care of unserviceable and unproductive animals.

Under recommendation, the committee suggested a survey of the country where "Go-Sadans" should be established, and the preparations of details of expenditures involved and enactment of legislation for raising funds by special cess.

The Committee was of opinion that a total sum of Rs. 24.4 crores non-recurring and Rs. 12.8 crores recurring would be needed for the preservation and improvement of cattle on the lines proposed in its third recommendation.

Now this brings me to the great venture of the Bombay Government in establishing a "Milk colony", in the village of Arey near Goregaon, about 20 miles from Bombay City. In my presidential address at the last extraordinary Conference held on 8th October 1947 in this very hall, I had referred to this big model Dairy, where ample facilities for education in Animal Husbandry and Dairy Science will be ideally available. Dr. Rajendra Prasad, President of the Constituent Assembly, did the opening ceremony of this big dairy centre on 13th March 1949. Explaining Government's efforts to keep an adequate supply of milk to the City, Mr. Dinkarrao Desai, the Honourable Minister for Civil Supplies, stated that a pasteurisation plant, the biggest of its kind in Asia, has been ordered and a few parts of it had already been received. The plant is expected to be installed by September next. Government proposes to start an educational institute at this place and even post-graduate training in cattle breeding and dairying is under contemplation. Here again I would like to refer to the point I have stressed as to why the Bombay Veterinary College should remain in Bombay. However, I cannot help cautioning the Government as regards epizootics. The prosperity of such a big cattle colony has a direct bearing on efficient and up-to-date application of Veterinary aid and treatment both in health and disease. I have got my honest fears about the attitude of the Government to separate mechanically health from disease. Health of a big herd can only be maintained if one knows what diseases are. The colony of this type needs supervision by Veterinarians of first class ability with scholastic and research attitude. I, therefore, put this before Government as a pointer and would suggest to the Government the better upkeep of the colony through expert Veterinary advice. About 15000 milch cattle shifted from Bombay will be accommodated in this colony. It was proposed to have two or three more colonies on the same lines and to completely evacuate cattle in greater Bombay area within two or three years. The cost of entire scheme was estimated at Rs. 4.25 crores.

I shall now briefly touch on the B. C. G. Vaccination and its value in control of Human and Bovine tuberculosis. This subject is of interest to both a Veterinary and a human practitioner and, as we are very fortunate to have an eminent personality of Dr. Gilder this evening, I am tempted to refer to the subject of common interest to both the professions.

1. The late Dr. J. A. Turner, Ex-Health Officer of Bombay Municipality, carried out an investigation on tuberculosis in cattle in Bombay in 1911. The late Mr. Sorab N. Raxina, G.B.V.C., then a most Senior Veterinary graduate

and myself, then a Junior Veterinary Inspector, were deputed by him to carry out tuberculin tests in cattle in Bombay. We tested 34 cows from Bandra Slaughter House, 5 buffaloes and 31 cows at Pinjarople, 26 cows and 9 buffaloes of private owners. Out of these, two cows from Pinjarople and three from private owners reacted. The rest did not react. The faeces of the two reactors were examined and found to contain acid fast bacilli of the same type as seen in milk. On post-mortem no tubercle bacilli could be found in any organ. But cysts and cystic degeneration were seen in plenty. The other cow that reacted to tuberculin, lived and calved thereafter. On reinoculation after three months, no reaction occurred. In 30 cows selected at Bandra, as looking suspicious, T. B. was found in the organs of one. The acid fast bacillus found in the milk was not tubercle (Dr. J. A. Turner 1911. Report of the investigation of Tuberculosis in Bombay).

2. Immediately thereafter, 4 carcasses of sambars from the zoo collection of Victoria Gardens were destroyed as suspects for tuberculosis. On post-mortem examination carried out by me, typical tuberculous lesions were found in all the four carcasses. Dr. Joshi of the Municipal laboratory confirmed the specimens as bovine form of tuberculosis. Simultaneously, I understand Col. Liston, the then Director of Haffkine Institute, carried out investigations on carcasses sent to him of lamas and sambars from zoo gardens. His confirmations were also identical. The infection was traced to the lamas that were imported some time previously to the Gardens from Germany.

3. Primates, i.e. Monkeys, are very much susceptible to pulmonary affection, and tuberculosis used to take a heavy toll of them in Victoria Gardens. About the year 1926-27, my predecessor Mr. Jamshed M. Doctor, G.B.V.C., the then Superintendent of Gardens, got open air annexes attached to monkey house constructed. The results were satisfactory.

4. In 1930, there again appeared T.B. amongst the sambars of the zoo, when I was the Superintendent of the Gardens. In collaboration with Dr. M. B. Soparkar of the Haffkine Institute, Tuberculin tests were carried out. There was positive reaction in all the adult sambars; whereas the young sambars born in the zoo and about one month old showed no reaction. All the reactors were destroyed to eradicate the presence of infection in the gardens. Autopsy showed positive T. B. lesions which were further confirmed by bacteriological examination (D. S. Laud. 1935 Bombay Municipality at work, City's Gardens.)

5. Bigger carnivora in the zoo are also not immune to T.B. I may quote a case of a full grown sturdy lion (father of eight litters) that became suddenly ill. At the autopsy held after the death of the lion, T. B. lesions were found in the liver, mesentery and right lung. (D. S. Laud 1937, *Indian Veterinary Journal* Vol. XIII - Wild Animals in Captivity.)

6. In the year 1937, under the auspices of King George Thanksgiving Fund and Indian Red Cross Society, a Post-graduate course was held in the month

of November in Bombay. I was then called upon on 26-11-37 to lecture to the post-graduate students on tuberculosis in cattle, at the Grant medical College, as a comparative study between animal and human tuberculosis. (*Medical Bulletin* 18th June 1928.)

But, while touching on this important subject of tuberculosis, I cannot let go the opportunity of mentioning the valuable work done in this field of investigation by some Indian veterinarians like Mr. Bachan Singh (C. P.) Mr. Laxmi Sahai (Bihar, Orissa, U. P.) Mr. Mahajan (Hyderabad) Mr. Sarvar, Mr. M. B. Menon (Mukteshwar) and Mr. R. N. Naik (Bombay Province).

Mr. Laxmi Sahai, I am pleased to mention, is the Director of Animal Husbandry and Veterinary Service of our province, while, Mr. R. N. Naik is the Bacteriologist and Vice Principal of the Bombay Veterinary College.

Now let us see what the B. C. G. vaccine is. Calmette and Guérin (1924) of Pasteur Institute of Paris announced a method of vaccination of cattle against tuberculosis with an attenuated strain of bovine Tubercle Bacillus. This strain has been called Bacillus of Calmette and Guérin or B. C. G. named after the authors. According to the authors, calves should be vaccinated preferably by intravenous route after birth but, at any rate, not later than the 15th day, after which they need to be protected from contact from virulent tubercle bacilli for one month. In India, before any action is taken to vaccinate cattle, it would be necessary to know the exact prevalence of tuberculosis in different parts of the country.

With regard to its use for protection in human beings, it may be said that B. C. G. has found favour in recent years in the Western countries, and more so in Scandinavian Countries where Vaccination is compulsory. In India, it is stated that group experiments are necessary to judge the effect of the inoculation and for general recommendation for mass Vaccination. This is the general opinion of the prominent medical practitioners in Great Britain, who were requested to comment by the *National Standard* London Office (N. S. March 3rd 1949) on the scheme recently inaugurated in Madras and already on hand in Bombay and Calcutta. As the British Medical opinion is divided, I now look forward to our distinguished guest of this evening, a prominent Bombay physician, to express his personal views on this important subject and give us the benefit of his scientific knowledge.

The Victoria Gardens is a combined Botanical and Zoological Garden. The Zoo collection is a modest one, as compared with that of Alipore Zoo at Calcutta or of Mysore. Even then, it has an interesting feature for the study of natural history and zoo technique. It is also a great breeding establishment. A number of young ones of various types of animals are born and bred in the garden every year. Veterinary students from our College would get immense benefit by periodical visits. Apart from the zoo technique there is another interesting feature of controlling, securing, handling and treating wild animals in

the infirmary of the Garden for various ailments. Animals in the zoo suffer from the same ailments which are common to domestic animals. Epidemics like foot and mouth are rarely seen. Plague in monkeys was noticed in 1925. Anti-plague vaccination brought the epidemic under control and the whole stock of monkeys was saved except three deaths. This was the first time when plague vaccine was used as prophylactic against plague in Bombay Zoo. Among the principal diseases of carnivora, diarrhoea, dysentery, paralysis, skin diseases, worms, liver and gastric troubles are common. Rickets is also noticed in animals born and bred in the zoo. Infectious diseases like Anthrax, H. S., Rinderpest, Distemper, and Tuberculosis are also met with. Thus the Gardens cover a wide field for study in animal diseases, animal breeding and zoo technique. It is hoped that the College authorities will exploit these facilities to the maximum extent for enlightening the student with much magnificent practical information.

Finally, I may mention of a very important discovery made by British scientists by finding out a drug to cure Mastitis in dairy cows. The drug is called "Nisin" which is similar to Penicillin, but is effective against two forms of the infection instead of one. One injection is needed instead of three or four as is the case with Penicillin. The development of the drug after years of experimental work is credited to Prof. H. D. Hay and Dr. A. T. R. Mattick of the National Institute for Research in Dairying at Reading, while working with other scientists. They are satisfied that Nisin cures at least 95% of the cases and is not detrimental to milk yield. Limited supply of the drug will be available in a few months. (*Free Press Bulletin*—March 25, 1949).

Gentlemen, we are meeting to-day at our regular Conference for the first time after we attained the "*Sampurna Swaraj*". On this important occasion, it is our first and foremost duty to pay our loyal respects and reverential homage to our Motherland and to our leader Mahatma Gandhi, the great architect of our freedom and the apostle of truth, virtue and non-violence. To our intense grief, Gandhiji is no more with us and we look to the gallant team of patriots of our country to follow Bapu's leadership in principle through thick and thin. All the more we, the members of Veterinary Profession, pledge ourselves to the country and to the toiling millions of this land to whom the livestock constitutes the entire wealth of the world.

We very much regret the sad plight in which Gujrat has been now placed. Gujrat is considered to be the garden of our province. Gujrat possesses finest breeds of cattle; likewise, also Sourashtra Kathiawar; but famine has stricken them resulting in great loss of human and animal lives. Our Government have already taken prompt action and it is hoped the measures taken will soon bring relief to the sufferers. Let us pray to the Almighty to be kind to us and hope we may have plentiful and early rains this year.

I do not wish to try your patience any longer. However, allow me a few minutes more for doing my duty of thanking all those who have rendered me

Review

POULTRY FARMING.--By S. G. GANAPATHY AYYAR, B.O.L.,
Theosophical Society, Adyar, Madras, 20. Price Rs. 2.

This is a handy little volume about Poultry Farming in Tamil which would be found useful by the lay public interested in poultry either as a hobby or even as a business proposition. In an easy and clear style, the author has dealt with the subject practically in all its aspects.

It is well known that, while the fowl remains neglected and undeveloped in its original home of India, it has been developed beyond recognition in the other parts of the world to which it was exported. It is therefore gratifying to see that the author has laid stress more on the development of the indigenous breed by careful selection and breeding. The chapters on feeding, rearing, hatching and housing are dealt with in a rational way while the chapter on diseases lays emphasis, and rightly too, on cleanliness and freedom from ticks and lice.

A book that can be recommended for beginners in poultry farming

~~LATE RAI BAHADUR~~ NILMONI CHATTERJEE, G.B.V.C.

We regret to record the death of Rai Bahadur Nilmoni Chatterjee, retired Deputy Director of Veterinary Services and Chief Technical Adviser, Government of Orissa, on the 7th June 1948 in his ancestral home at Bally, Howrah District, W. Bengal, where he was living since his retirement in 1942.

He had a distinguished career under the Government of Bengal and knew the conditions of livestock, villages and people.

He had the unique opportunity of explaining to Mahatma of Animal Husbandry work when that Great Apostle Primary Section of Agricultural and Industrial Prissa, in 1936.

session. We extend our sincere
family.

[illegible]

தமிழ்நாடு ஆவணக்காப்பக நூலகம்,
எழுப்பூர், சென்னை-600 008.

புவணைத்தாள்.

கே. எண் :

ப. எண் :

வழங்கிய நாள். (1)	திரும்பிய நாள். (2)	வழங்கிய நாள். (1)	திரும்பிய நாள். (2)