

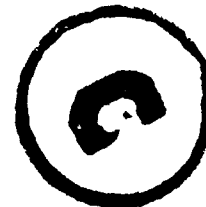
435

The Indian Veterinary

Journal

1943. May.

VOL. 19. NO. 6



JL
KZM2, N24
N43.19.6
79807

THE
INDIAN VETERINARY JOURNAL

Published Bi-monthly

(THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION)

26, WALLAJAH ROAD, MOUNT ROAD, MADRAS

EUFLAVINE

(May & Baker)

A high proportion of recoveries from streptococcal mastitis can be obtained by carrying out udder infusion treatment with a 1:10,000 solution of EUFLAVINE. The best results are obtained in recently infected and subclinical cases.

EUFLAVINE is conveniently supplied in the form of tablets of 1.75 grains for dissolving in distilled or boiled water. One tablet in two pints of water gives a 1:10,000 solution.

Detailed information on the technique of udder irrigation will be gladly supplied on request.

EUFLAVINE is supplied as follows:

Containers of 30 x 1.75 gm. tablets at Rs. 3-15-0.

MAY & BAKER (INDIA) LIMITED

BOMBAY

CALCUTTA



5L
KZ.m2,N24

N43.19.6

79807



Reliable Veterinary Products

● FOR PASSIVE IMMUNISATION
TETANUS ANTITOXIC SERUM

2000 and 6000 I.U.

● FOR ACTIVE IMMUNISATION
TETANUS ANATOXIN

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

● FOR ACTIVE LEUCOCYTOSIS
NUCLEIN

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

BENGAL CHEMICAL
CALCUTTA : : BOMBAY

Low Toxicity
and
Uniform Efficacy
are the outstanding features
of

UREA SULPHAZIDE

The Sulphonamide Compound.
Red solution for injection in 30 c.c.
Vials, 2 and 5 c.c. ampoules.
White tablets for oral use
in tubes of 20 and bottles
of 100 and 1000.

UNION DRUG CO. LTD. CALCUTTA.

285, BOWBAZAR STREET

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

T'Gram:
"Benzoic"
Cal.

When writing to advertisers, please mention this Journal.

Published Bi-monthly
Vol. XIX



May 1943
No. 6

The Indian Veterinary Journal

(The Journal of the All-India Veterinary Association)

NOTICE TO SUBSCRIBERS

Subscribers are hereby requested to remit their annual subscription for the next volume to the Editor, so as to reach him by the 30th of June, 1943 after which date the Journal will be sent as usual by V.P.P., to realise the annual subscription.

MADRAS,
1st May, 1943

P. SRINIVASA RAO, G.M.V.C.,
Editor,
The Indian Veterinary Journal.

Editor:

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

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

PRINTED AT

CENTRAL ART PRESS, 14, SINGANNA NAICK STREET, G. T. MADRAS

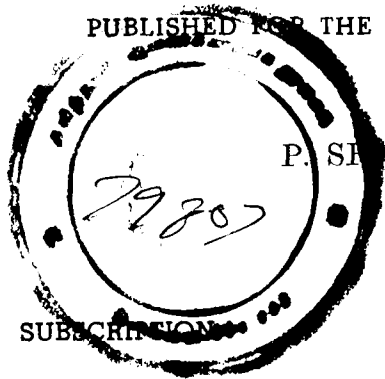
1943

NOTICE

The Indian Veterinary Journal

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

PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION



EDITOR:
P. S. NIVASA RAO, G.M.V.C.

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

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

1. Original Articles, Clinical Notes, Society Reports and Notes on interesting cases are invited. Contributors of Original Articles will receive 25 copies of their papers *free* if wanted.

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

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

4. Members who do not receive the Journal regularly, or who find it wrongly addressed, are requested to communicate their correct address to the Editor at once.



Dr. PANGAL'S

Veterinary Institute

26, Wallajah Road, Mount Road,

MADRAS

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

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

For Other Specialities please apply for Literature.

When writing to advertisers, please mention this Journal.

THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XIX

MAY 1943

No. 6

CONTENTS

Original Articles	PAGE
A Collection of Helminths from Goats, not Recorded from South India.-- By S. Vaidyanatha Mudaliar, Madras	287
Some Helminths Recorded for the First Time from South India. -- By S. Vaidyanatha Mudaliar, Madras	289
General Articles	
Methods of Semen Evaluation. -- By J. D. Sampath Kumaran, B.S.A., L.V.P., Jaipur	290
The Evil Effects of Hand-feeding Cattle with Jonna Straw. -- By M. Ramakrishna Pillai, G.M.V.C., Madras	301
Sheep Husbandry in India. -- By R. L. Kaura, B.V.Sc., M.R.C.V.S., Orissa	307
Editorial	
Indiscriminate Slaughter	319
Clinical Cases	
An Interesting Case of Rabies in a She Buffalo. -- By T.L. Anantharaman, G.M.V.C., Madras	321
Eclampsia in a Bitch. -- By K. S. Prakasa Rao, G.M.V.C., Bezwada	322
A Case of Milk Fever in a Cow. -- By R. Veeramoney, G.M.V.C., Madras	322
Bismuth Salicylas in the Treatment of Papilloma. -- By V. Venkataraman, G.M.V.C., Madras	323
Rupture of Abomasum or Fourth Stomach in a Cow. -- By A. H. Khan, G.B.V.C., P.G. (Edin.), Bombay	324
Prolapse of Bowels in a Bullock. -- By V. G. Khare, G.B.V.C., Baroda	325
A Case of Dystokia Due to Ascites of the Foetus. -- By R. Kuppanna Iyengar, G.M.V.C., Madras	326
Demodectic Mange in Bovines. -- By R. Kuppanna Iyengar, G.M.V.C.	327
A Case of Acute Cutaneous Glanders in Man. -- By G. Panja, M.B., and B. C. Chatterjee, M.B., D.T.M., D.Ph., Calcutta	330
A Short Note on Haemorrhagic Septicaemia. -- By P. V. Doraiswamy, G.M.V.C., Madras	333
Announcement	
Imperial Dairy Research Institute, Bangalore -- Honorary Research Workers	334
Indian Army Veterinary Corps -- Further list of V.A.Ss.	334
Discoverer of M. & B. 693 made an F.R.S. -- Dr. Arthur James Ewins	335
Association News	
The All-India Veterinary Association, Madras Branch	336
College News	
Bombay Veterinary College -- Results of Diploma Examination, 1942-43	337
Bengal Veterinary College -- Do do	337
Bihar Veterinary College -- Results of Diploma Examination 1942-43	338
" -- Notice of admission	339
Madras Veterinary College -- Results of Diploma Examination 1942-43	341
" -- Panikkar Memorial Fund	341
Extract	
Fifth Meeting of the Animal Husbandry Wing of the Imperial Council of Agricultural Research -- Conference Resolutions	342
Review	
Physiology of Domestic Animals. -- By H. H. Dukes, D.V.M., M.S.	344
Errata	344

THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XIX

MAY 1943

No. 6

Original Articles

A COLLECTION OF HELMINTHS FROM GOATS, NOT RECORDED FROM SOUTH INDIA

BY

S. VAIDYANATHA MUDALIAR,
Lecturer in Parasitology, Madras Veterinary College.

In the course of post-mortem examinations on several goats, that were utilised in caprine pleuropneumonia experiments at this laboratory, in 1938, it was possible for the author to make a study of the helminthic material, that was collected from these goats. In this collection were found the following three parasites which have not been recorded from this part of India so far. These are *Oesophagostomum venulosum*; *gaigeria pachyscelis* and *stilesia vittata*. Opportunity is now taken to place these on record.

1. "*Oesophagostomum venulosum* (Rudolph, 1809).

This was first recorded by Gaiger (1915) as occurring among sheep. Bhalerao (1932) made a record of this parasite in goats from a collection consisting of one male and about half a dozen females. A large number of worms (more than 200) was collected in this laboratory and also from material obtained from Venkatagiri, Nellore District, South India.

Host—Goat.

Location—Caecum and colon.

Locality—Madras (1938).

2. *Gaigeria pachyscelis* (Railliet and Henry, 1910)

This worm was first recorded by Railliet and Henry from material sent to them by Gaiger from India and excepting for a second record by Cameron

(1924) no mention of the parasite appears to have been made in recent times from India. A fairly large number (20) of individuals from the intestines of goats was collected here.

Host—Goat.

Location—S. Intestines.

Locality—Madras (1938).

3. *Stilesia vittata* (Railliet, 1896).

This tape-worm was first met with in this laboratory among a collection of helminths from goats, received from Venkatagiri, Nellore District. Similar worms were later obtained in a collection, from a goat used for experimental purposes. This parasite has been recorded by Southwell (1930) who maintains that it is found exclusively in camels. Bhalerao (1935) recorded this parasite from goats and sheep for the first time and the present would appear to be the second record of its occurrence in goats in India.

Host—Goat.

Location—S. Intestines.

Locality—Madras (1938).

All the three specimens are deposited in the museum of the Department of Parasitology, Madras Veterinary College Laboratory.

REFERENCES

- Bhalerao, G. D. (1932). *Indian Journal of Veterinary Science and Animal Husbandry*. 2 pp. 242-254.
- Do. (1935). *Ibid.* 5 pp. 33-34.
- Cameron, T. 10 M. (1924). *Journal of Helminthology*. 2 pp. 41-45.
- Gaiger S. H. (1915). *Journal of Comparative Pathology and Therapeutics*. 38 pp. 67-76.
- Southwell, T. (1935). *Fauna of British India, Cestoda II* pp. 51-53.

SOME HELMINTHS RECORDED FOR THE FIRST TIME FROM SOUTH INDIA

BY

S. VAIDYANATHA MUDALIAR,

Lecturer in Parasitology, Madras Veterinary College.

1. *Galuncus perniciosus* (Railliet, 1918).

Baylis and Daubney (1922) have recorded this parasite for the first time from India though this is said to be commonly met with in tigers and leopards of European menageries. The specimen in our collection was obtained from intestinal nodules of a leopard (*Felis pardus*) shot in the forest area, adjoining Hosur in Salem District, South India. A few nodules were seen studding the intestinal wall and the parasites were recovered mostly in pieces, by dissection of the material. They were identified to be *Galuncus perniciosus* and the occurrence is recorded now for the first time in South India.

Host—*Felis pardus*.

Location—Intestines.

Locality—Hosur, South India (1942).

2. *Opisthorchis neverca* (Braun, 1902).

This trematode parasite was recovered from the gall-bladder of a dog, during post-mortem examination made on its carcass. Opportunity is availed to record this parasite from South India for the first time.

Host—*Canis familiaris*.

Location—Gall bladder.

Locality—Madras (1942).

These, put in 11 mm. blood tubes with a crystal of thymol (to stop bacterial growth), serve as standards. One-tenth of a millilitre of semen in 5 ml. of suspension fluid is a dilution suitable for use with these standards. Comparisons are made in front of electric lights with a piece of window screen immediately behind the tubes. The ease with which the cross wires are seen through the suspension makes comparison quite simple. Counts have to be made on the samples in order to find out the standard error of estimate.

The second method is based on the measurement of light transmission through sperm suspensions by means of a photoelectric colorimeter. The light source is adjusted to give a galvanometer reading of 100 with clear suspension fluid. This blank is then replaced with the diluted semen; 0.08 ml. of semen in 15 ml. suspension fluid is a suitable dilution. Light transmission and, therefore, galvanometer readings for diluted semen, will be in inverse proportion to density. The regression will be slightly curvilinear. The standard error of estimate from quadratic regression on galvanometer reading would be about 27.9.

Determination of motility, counting of the sperm cells per cm. abnormalities of the sperm, and examination for pathological cells are made with the microscope. For routine examinations, magnifications of 300 to 400 diameters are most satisfactory. Samples for examination should be taken immediately after collection and care should be exercised to see that the sample is representative of the whole ejaculate. In stallion, jack and dog, certain portion of the ejaculate may be low in concentration. This is due to the secretion of the accessory reproductive glands which make up a large part of the ejaculate. Examination for motility is best made by means of the hanging-drop technique. This is accomplished by placing a well-mixed drop of semen on a coverslip and inverting it on a hollow-ground slide. In this examination care must be taken to prevent any great drop in temperature of the semen, for movement is greatly retarded by cooling and ceases altogether at lower temperatures. To accomplish this the examination should be done in a warm room or by providing some means of keeping the same at a constant temperature of 38 to 40 degrees centigrade, such as a slide incubator, a heating pad, or hot-water bottle. Care must be used however, not to have the temperature too high, as sperms are killed at 46 degrees centigrade. In case hollow-ground slides are not available, a fairly satisfactory examination for motility may be made by placing a drop of semen on a coverslip inverting this on a slide, and having each end of the coverslip supported by other coverslips, thus providing space for the semen.

The type of motility varies and three main types have been recognized :

(1) A progressive motion in which the spermatozoon usually moves in a straight line, (2) a rotary motion in which the movements along the edge

of a circle whose diameter is usually not longer than the spermatozoon, and (3) an oscillatory motion in which the movements consist of convulsive motions without change of place. The sperm must possess progressive motion if it is to meet and fertilize the ovum.

A very simple system for grading motility which is sufficient for practical purposes have been devised by Russian workers. It is based upon a discrimination in various types of motility and the proportion of sperms exhibiting the respective types. Semen in which nearly all the spermatozoa exhibit energetic progressive motion are graded 5, the highest mark; semen in which most of the sperms have progressive motions are graded 4; samples in which there are about equal proportions of sperms exhibiting progressive motion and oscillatory motion or are immotile are graded 3; samples with oscillatory motion and large number immotile are graded 2; those that are immotile are graded 1; and if no sperms are present, the grade is 0.

Many workers have made careful study concerning the rate at which spermatozoa travel in the genital tract of the female. This knowledge will be helpful in appreciating the value of having the greatest percentage of sperms having the progressive motion. Beshlebnov (1938) found bull sperm in the ovarian end of the fallopian tubes 4 hours after insemination and in one case only 1½ hours were required—Hartman and Ball (1930) reported rat sperm in the distal end of the horn 100 seconds after copulation. Parker (1930) stated that 4 hours were required for the rabbit sperm to reach the infundibulum. Evans (1933) found dog sperm in the oviduct 25 seconds after ejaculation by the male. Philips and Andrews (1937) located sheep sperm in the ovarian end of the Fallopian tubes, in a minimum time of 30 minutes after insemination. Green and Winters (1935), in studies on sheep reported the time required for sperm to traverse the tract to be 5 to 6 hours. Lewis (1911) obtained sperm from the oviduct of the sow 7 hours after copulation. Long and Evans (1922) state that 4 hours are required for the mouse sperm to reach the distal end of the oviduct. Brewster, Ralph May and Cole (1940) state that the length of the female tract is significantly greater in animals having had at least one parturition. Minimum time required for sperm to reach the upper tube in mature cows was 5 hours and 30 minutes. In heifers, the time was 4 hours and 15 minutes. They suggest that the time required for sperm to reach the infundibulum in mature cows will range between 6 and 9 hours, and in heifers, between 4 and 9 hours.

Walton and Edwards (1938) have shown that the efficiency of bulls is positively correlated to the respiration rate of the sperm. Comstock (1938, 1939a, 1939b) has demonstrated that the glycolytic power of the sperm cells is related to their viability. A correlation of 0.88 between respiration and glycolysis rates was found.

General Articles

METHODS OF SEMEN EVALUATION

BY

J. D. SAMPATH KUMARAN, B.S.A., L.V.P. (Hons.) OF I.A.R.I.,
Birla College, Pilani, Jaipur State, on Deputation

“Every animal appears as a sum of vital units, each of which bears in itself the complete characteristics of life.”—*Virchow*.

While many are interested in the scientific questions relating to cytology, genetics and heredity and would like to understand the underlying principles and laws governing these matters, I presume that more are interested in the practical application of the natural laws and appreciate to the fullest extent information that will enable them to apply whatever knowledge may be gained by investigations of this character. There is generally a dread on the part of most people in undertaking anything new. But since there is nothing about the anatomy of the reproductive organs of the domestic animals that is difficult to understand, and the necessary instruments to be used in artificial insemination have been given in my previous article, there seems to be no reason, why every breeder should not practise this method.

It has been recognized that there is a sound relationship between the characteristics of the semen and its fertility. It is therefore desirable that in males intended for extensive use, the semen should be subjected to complete examination. Sires should be examined prior to and at intervals throughout the breeding season. In addition, a competent clinical examination of the genitals of the breeding animals is necessary if breeding losses are to be minimised and controlled.

The clinical examination of the reproductive organ may be done as follows. In the bull, it is best done in the standing position. The bull should be restrained and the testicles examined from behind. The two testicles should be approximately equal in size, of a firm structure and even contour and they should show no sign of heat, pain or swelling. The epididymis and part of the Vas Deferentia can be examined from this position.

The lower portion of the epididymis usually lodges any infection and this has to be particularly examined. The Vas Deferentia may well be

examined per rectum. It may be picked up as they emerge from the inguinal canal and followed along to the vesicula seminalis, prostate and cowpers glands. The bull should be thrown to the sides and his feet stretched out forward and backward and secured to posts. In this position the sigmoid flexure of the penis could be eliminated by pushing forward and upward and the gland protruded from the sheath. For any abnormalities examination is to be made.

After the clinical examination, the semen has to be investigated for its physical and chemical characteristics. This includes the volume, colour, density, motility, pH, glycolysis, respiration of the sperm etc. etc.

As the number of inseminations that can be made from any one male is dependent upon the volume of semen produced, it is important to use males producing large quantities of semen containing large numbers of active, viable spermatozoa. Volume of semen may be measured in a graduated test-tube, bottle or pipette. Measurement of the volume of semen production should be made upon the total ejaculate produced in a given interval of time upon several different occasions. The volume of semen depends upon the different periods of the year. The maximum production in different Indian breeds was found in winter season. In the Sahiwal bull the maximum amount obtained was 7 c.c. and the maximum in Amritmahal was 6½ c.c. and in the imported Holstein Friesian Bull, the maximum was 9½ c.c.

The colour and consistency of semen give some clues as to its quality. A yellowish colour may be due to the presence of pus or urine, which may often be detected by smell. A pinkish or reddish colour indicates an admixture of fresh blood, while a deeper red or brownish colouration probably indicates the presence of degenerating blood and tissues. A greenish colouration may indicate purulent degeneration. Such conditions indicate pathological conditions of the genitals.

The cloud formation in the bull semen is also a dependable index of quality. When the swirling cloudiness is marked the conception percentage will be about 80 per cent, when the cloudiness is little the conception is 55 per cent, when slight 25 per cent, and when the cloudiness is absent, the conception percentage is about 5.

The density of semen can be determined by counting cells in a haemocytometer, but this is time-consuming; counting time runs five or less samples per hour. There are two rapid methods which can be conveniently adopted. The first is Burbank's (1935) method, comparing sperm suspensions with opacity standards. One per cent of BaSO₄ is suspended in 1 per cent aqueous solution of sodium citrate. A series of dilutions (5-20 per cent at intervals of 2.5 per cent) are made in 1 per cent sodium citrate.

dyes, but in some cases shows a more deeply staining cortical layer and a lighter central region. In a few cases the nucleus is represented by a group of separate chromosomes, visible even in the living object, so that they may

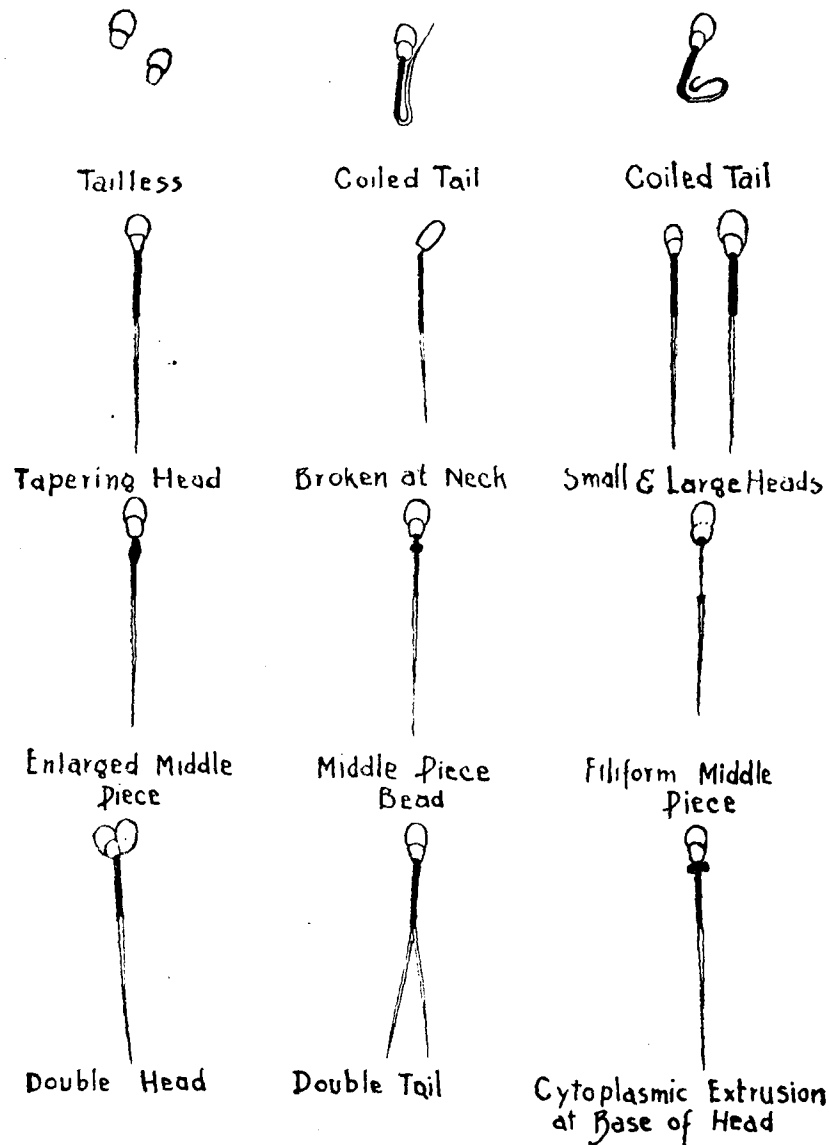


Fig. 1. Types of Abnormal Sperms

readily be counted (some nematodes). The foremost part of the head is the (2) Apical body or acrosome, also known as the 'perforatorium' in allusion to its formerly supposed function as a means of boring into the egg. This part also exhibits a great diversity of form. This diversity of form may

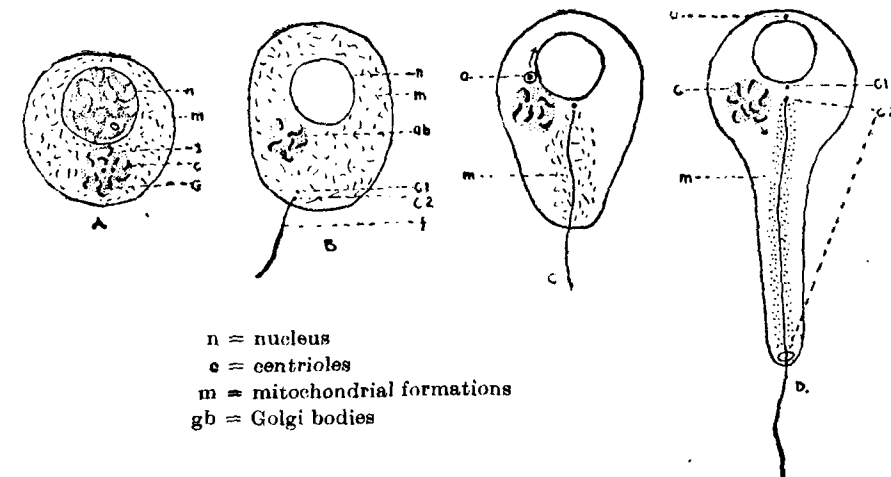


Fig. 2. Development of the Sperm

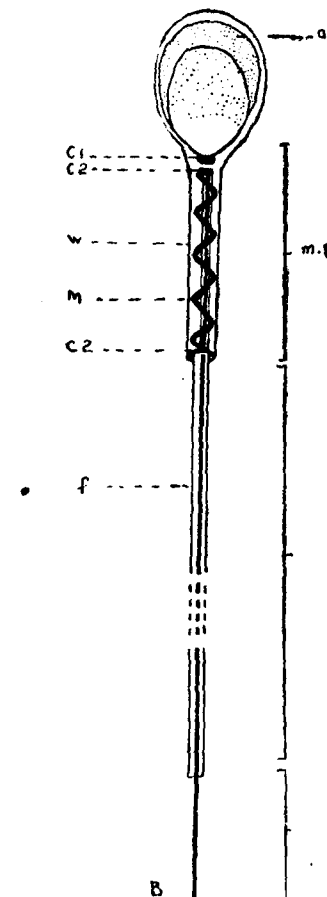


Fig. 3. Mammalian sperm

vary from a small granule to a large conical process, which in extreme cases is provided with a prominent barb like that of a fish hook. By a further development of this type, the acrosome may be drawn out into a long filiform process that almost simulates an anterior flagellum. By a different type of modification it spreads out to form a large, crescent shape body moulded upon the anterior part of the nucleus of which it was formerly supposed to be a part. In this case the extreme peripheral layer of the acrosome is called the "headcap" which often extends backwards over a considerable part of the nucleus. In such sperms the head is often flattened, the acrosome forming a thin knife-like edge, which has been supposed to facilitate the entrance of the sperm into the egg, but its function is still problematical. In some animals the acrosome lies more or less on the side of the nucleus, and is sometimes drawn out along almost the entire length of the nucleus. The definite acrosome seems always to be formed from or within a clear vacuole-like space that appears within that part of the acroblast that passes to the anterior nuclear pole. Within this space appears a small deeply staining spheroidal body which by some was mistaken for centriole; it

Comstock (1940) has devised a new simplified portable equipment for measuring respiration of sperm cells. It is indeed unique in the sense that it is very simple. The principle on which it works is the same as the Haldane gas analysis apparatus and the Barcroft apparatus modified according to Dixon (1934), namely, the direct measurement of volume change when pressure is constant. This is accomplished by means of a small flask (8—10 ml.) with a calibrated capillary side arm which is open at the distal end. Measurements are made in a constant temperature water bath. After temperature equilibrium is reached an amount of water equal in volume to the oxygen used is drawn into the side arm. Since the capillary is calibrated this volume can be read directly. A 0.2 ml. pipette serves admirably for the side arm since it furnishes a suitable calibrated volume of sufficient length to give the desired sensitivity. This connects to the flask through a ground glass stopcock, a short piece of glass tubing, and a ground glass joint. The glass tube between the stopcock and the joint is so bent that the side arm will point down at an angle of about 85 degrees to the perpendicular axis of the flask. The flask must contain a small (0.3—0.4 ml.) inset cup in which to place hydroxide for the absorption of carbon dioxide. The flasks are held in place under the water by a brass stand. This consists of a rectangular base with upright strips along one side fitted with clips to hold the flasks by their necks. It also has a cross bar at the proper height along the other side with notches for the side arms to fit into when the flasks are in place. This prevents turning and loosening of the ground glass joints when the stopcocks are turned.

The respiration of sperm is measured as follows. The bath is filled with clean water of the desired temperature. The unit for determining the blank reading is put in place and adjusted. The flasks with semen, suspension fluid, and hydroxide in place and side arms attached are put in the brass rack and, with stopcocks open, set on the bottom of the water bath. After ten minutes the stopcocks are closed, readings at the end of the water columns are taken, and the stopcocks reopened. The blank reading is taken at the same time. At the end of a specified period of time readings are again taken. Negative differences in blank readings are added to the difference between the initial and final readings of each unit; positive ones are subtracted.

The quality of spermatozoa may also be measured by a study of the sperm cytology. It would therefore be of interest to know the details of the sperm. Our knowledge of sperm dates back to 1677 when Leeuwenhock discovered that the sperm or fertilizing fluid contains innumerable minute bodies, endowed with the power of active movement, and therefore regarded as parasitic animalcules or infusoria—hence the term spermatozoa (sperm-animals), by which the sperms are still often called. As long ago as

1786, however, the experiments of Spallanzani proved that the fertilizing power must lie in the sperms, not in the liquid in which they swim, because the spermatid fluid loses its power when filtered. Spallanzani himself, it is true, did not thus interpret his results, but concluded, strangely enough, that the fertilizing effect was due to the seminal fluid in which the sperms swim. In 1824 the correct conclusion seems first to have been drawn by Prevost and Dumas, who in addition to repeating Spallanzani's experiments performed many others demonstrating that "The prolific principal residues in the spermatid animalcules" is the main agent. In 1841 Kollikar demonstrated that the sperms arise by the transformation of cells in the testis, obviously therefore, they are not parasites, but like the ovum, form a part of the parent organisms. In 1865, finally, the final proof was attained by Schweigger-Seidal and La Valette St. George that the sperm does not consist of a nucleus alone, as Kollikar believed, but contains also cytoplasm. It was thus shown to be, like the egg, a single cell, peculiarly modified in structure and of extreme minuteness, yet morphologically equivalent to other cells. The discovery of the sperm is often accredited to Ludwig Hamm, a pupil of Leeuwenhock.

The sperms arise by differentiation of cells known as spermatids, which have a well-developed cytoplasmic cell-body containing a nucleus, one or two centrioles, mitochondrial formations and Golgi bodies. The centrioles at first lie close together near the periphery of the cell, with one nearer the nucleus, the other nearer the periphery. All these structures take part in the formation of the sperm. The centrioles take an important part in the formation of the flagellum, the distal one playing the part of a blepharoplast from which the axial filament of the tail grows forth.

The sperm structures could be conventionally grouped into head, middle piece and tail. This is based entirely on superficial characters. Each of these parts typically consists of two parts. The head has the Acrosome and the nucleus, the middle-piece has the neck and the connecting piece and the tail has the pars principalis and the end piece.

The head considered as a whole, displays a great diversity of form in different species and groups. It is spheroidal in invertebrates like teleostes; conical in cyprina, lance-shaped in salamanders, rod-shaped in insects; spirally twisted in passerine birds; spoon-shaped in man, guinea-pigs, and many mammals; hood-shaped in opossum; and hook-shaped in mouse, rats etc. The diversity is so great that most species of animals might be identified from sperm alone.

The head is constituted by (1) the Nucleus, which occupies all but the anterior tip of the head. It often seems to consist of a solid and homogeneous mass of basichromatin that stains with great intensity in all nuclear

is clearly certain that the acrosome granule is formed by the fusion of the pro-acrosome granules already present within the spermatocyte-idiosome. These granules are set free in the cytosome when the idiosome breaks up, persist during the first division, reaggregate within the substance of the acroblast where they are surrounded by small vacuoles. A progressive process of fusion now sets in, the vacuoles running together until they produce the usual large clear vesicle, which the granules progressively fuse until they form a single much larger body. It is assumed that the Golgi-bodies are somewhat concerned in the formation of the acrosome. If that is a fact, it is incredible that so elaborate a process is necessary for the formation of a structure whose only function lies in the attachment of the sperm to and penetration into the egg. It is suggested that the Golgi-apparatus may be a centre for the formation of enzyme which may play a part in the activation of egg. Green and Comstock (1939) made an elaborate study on the limiting membrane of the ram's sperm in an attempt to find a morphological measure of the physiological condition of spermatozoa. Normally this membrane does not appear as sharply and distinctly as do the borders of some other cell types. However, by using aceto-carmin stain and darkfield illumination, the membrane about the head may be seen clearly. On most ram spermatozoa the membrane is structureless but on some cells a small hyaline vesicle may be observed on the anterior border. This structure is apparently a component of the membrane itself because the vesicle is completely outlined by the external limiting wall of the cell. The vesicle was not a constant feature of all the cells. The per cent of vesiculated cells in fresh sample varied from one to fifty per cent. Sperms from different rams were more or less consistent in the relative per cent of cells exhibiting this structure. Since there was a variation in this particular structure studies were carried out to find out whether there existed any physiological correlation or not. Samples of higher initial per cent of these structures tend to live longer and maintain a higher degree of motility over a given period of time. Conditions, such as ageing or frequent ejaculation, which tend to lower sperm quality are reflected in the smaller number of vesicles present. There is positive correlation between the glycolysis ability of the individual cells and the factor of density and a negative correlation between the number of vesiculated cells and abnormal heads.

Smith (1940) calculated for fresh bull semen the neutralization curves and buffer co-efficients. It was well buffered in the regions of pH 4.0 to 5.5 and 9.0 to 10.0 but poorly buffered to other degrees of acidity. The buffering action of aged semen was found to be reduced.

Munro (1938) made a study with mature young cockerels the length of sperm life in the vas deferens under conditions of vas isolation without castration and accompanied by castration were compared. The mature

sperms in the isolated ductus deferens retained the capacity for movement in physiological saline for an average from 26 to 28 days in each instance, thus indicating that the testis hormone is not directly concerned with the maintenance of sperm life in the ex-current reproductive duct of the fowl.

Davis (1940) collected samples of semen from 11 bulls of different breeds and stored them upto 99 hours at temperatures ranging from 35° to 50° F. and studied their comparative motility, pH concentration of sperm per cubic millimeter and viability in fertility experiments. The lower pH was associated with a higher progressive motility and higher concentration of sperm.

Gunn (1936) by raising the carbondioxide tension to that of tissue as distinct from pulmonary level and by lowering the temperature was able to bring about a condition analogous to that of the hibernating animal, and was able to retain the motility of the ram's sperm for 64 days.

Chang and Walton (1940) found that a temperature as low as 1°C. was not harmful to ram's spermatozoa provided the cooling was done gradually, sudden cooling being deleterious. They obtained optimum storage results by reducing 5° at intervals of 2 hours each. No temperature shock on warming slowly or rapidly. They were able to retain 74 per cent of the original activity for 6 days and in exceptional cases 87 and 82 per cent for 13 and 14 days.

Lardy et al (1940) obtained the following fluids either during life or immediately after slaughter, and their pH values determined by means of a glass electrode. The following are their results: Vaginal douche 6.0 to 6.7 pH, cervical fluid 7.6 to 8.9 pH, distilled water washing through uterus 6.6 to 7.2 pH, amniotic fluid from calf foetus 6.6 to 7.2 pH, and follicular fluid 7.5 to 7.7 pH. The average pH of the uterus was 6.8 pH, which is the optimum for the storage of semen.

In an extensive study carried on by the author, it was found that the semen varies very widely in all the properties studied. Semen from the same animal varies from season to season. Even in the same season, there is variation which is due to the number of services given before. There is also the effect of specific diet. Whenever the vitamin C content was high, there was a marked increase in the initial motility of the sperm. Greatest variation also occurred in the number and percentage of abnormal sperms. Bulls with very poor breeding records revealed more than 30% abnormal sperm. The frequent types of abnormalities of spermatozoa found were coiled tails, tailless, and pyriform. Defective tails were preponderant in all the poor breeders, also the pH was more than 7.0. Sperms with low motility survived only for a short time.

The practice in some parts of our country is to give raw eggs to the bull after service. This animal protein has a beneficial effect in increasing the motility of sperms.

Want of exercise, too high or too low vegetable protein diet, deficiency in one or other vitamins especially E, higher temperature and frequent services are the main causes for the low quality of sperms produced.

(The chemical composition, sperm staining technique etc. etc. will be dealt with in the next issue of this journal).

Literature Cited

1. Beschlebov, A. V. The Optimal Time for Inseminating Cows during estrus. Probl. Zivotn., No. 2, 73-88. 1938. (From Animal Breeding Abstracts 6: 291).
2. Brewster, J. E., Ralph May, and Cole, C. L. The time of ovulation and rate of spermatozoa travel in 'Cattle. 33rd Annual Proc. Am. Soc. An. Prod. 1940.
3. Chang, M. C. and Walton, A. The effects of Low Temperature and acclimatization on the Respiratory Activity and Survival of ram spermatozoa. Abst. Expt. Sta. Rec. 85 (1) pp. 57, 1940.
4. Comstock, R. E. A Study of the Mammalian Sperm Cell. A Thesis. 1938.
5. „ A Study of the Mammalian Sperm Cell. J. Expt. Zool., 81, pp. 147-164. 1939.
6. „ and Green, W. W. Methods of Semen Evaluation. Proc. Am. Soc. An. Prod. 32nd. pp. 213-216. 1939.
7. Comstock, R. E. New Portable Equipment for Measuring Respiration of Sperm Cells. Paper No. 1859. Scientific Journal Series of the Minnesota Agric. Expt. Station. 1940.
8. Davis, H. P. The Effect of Storage Temperature upon certain characteristics of Bovine Semen. J. Dairy Sci. 23 No. 11, pp. 1057-1068.
9. Dixon, M. Manometer Methods as applied to the Measurement of Cell Respiration and other processes. Cambridge. 1934.
10. Evans, E. J. Transport of Sperm in the Dog. Am. Jour. Physiol. 105, pp. 287, 1933.
11. Green and Comstock, R. E. Sperm cytology in Relation to Viability. Paper No. 1761, Scientific Journal Series of the Minnesota Agric. Expt. Station. 1939.
12. Green, W. W. and Winters, L. M. Studies on the Physiology of Reproduction in the Sheep. Aust. Rec., 61, No. 4, 1935.
13. Gunn, R. M. C. Artificial Production of Seminal Ejaculate and the Characters of Spermatozoa contained therein. Bull. Toun. Scil. Industr. Res. Aust. No. 94, 1936.
14. Harman, C. G. and Ball, J. On the Almost Instantaneous Transport of Spermatozoa through the Cervix and Uterus in the Rat. Proc. Soc. Expt. Biol. and Med. 28, pp. 312, 1930.

15. Lardy Et. Al. Abst. Vety. Bull. 11. No. 8 pp. 563, 1940.
16. Lewis. Artificial Insemination. Oklahoma Agric. Expt. Sta. Bull. No. 93, 1911.
17. Long, J. A. and Evans, H. M. The Oestrus Cycle in the Rat and its Associated Phenomena. Memoirs of Univ. Calif., 6. 1922.
18. Munro, S. S. The effect of Testis Hormone on the Preservation of Sperm Life in the Vas Deferens of Fowl. J. Expt. Biol. 15, No. 2 pp. 186-196.
19. Parker, G. H. The Passage of the Spermatozoa and Ova through the Oviducts of the Rabbit. Proc. Soc. Expt. Biol. and Med. 27, pp. 826. 1930.
20. Phillips Ralph, W. and Andrews, F. N.. The speed of Travel of Ram Spermatozoa. Anat. Rec. 28, No. 1. 1937.
21. Smith, S. E. and Asdell, S. A. The Buffering capacity of the Bull Sperm. Cornell. Vet. 30. No. 4, pp. 499-506.
22. Walton, A. and Edwards, J. Criteria of Fertility in the Bull. Proc. Am. Soc. An. Pro. 31st, pp. 254-259.

THE EVIL EFFECTS OF HAND-FEEDING CATTLE WITH JONNA STRAW

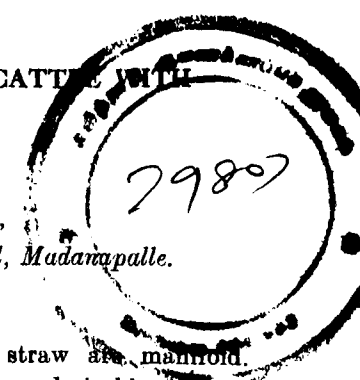
BY

M. RAMAKRISHNA PILLAI, G.M.V.C.,

Veterinary Assistant Surgeon, Veterinary Hospital, Madanapalle.

Introduction

The evil effects of hand-feeding cattle with jonna straw are manifold. The ryots in Anantapur and Chittoor Districts adopt this undesirable practice probably with a false notion that they can make their animals eat more than what they would do if left to themselves and also to avoid some wastage. Jonna straw as a rule should be chopped into bits of four to six inches and given to animals to be eaten of their own accord. By this method, there is apt to be a small percentage of wastage. All the tender parts are eaten, and the rough parts, especially those near the roots are liable to be discarded. The frugal ryots who do not wish that any portion of their fodder should be thus wasted adopt this harmful method of hand feeding. Generally the farm-worker who has less work during jonna season (October to January) just selects a suitable elevated seat, either a pial, a stone, or a tree over which he sits on a level with the animal's mouth and thrusts the jonna stalks in with his hands. He has always two animals at a time and feeds each animal with one hand. He commences his thrust with the bottom or the rough portion first and then ends it with the tender or the top portion—a special contrivance by which he makes the animal eat the unpalatable part first and the palatable part last—so as to avoid the slight wastage mentioned above. He goes on thrusting the jonna stalks in



52
107 48.115
NA3.49.6

until perhaps there is no space in the rumen to hold any more straw. It is during this process that complications occur.

In addition to general affections like Pharyngitis, Laryngitis, Overgrown molars, impaction and other digestive troubles, the following are the special complications,—which come under the scope of this paper—and they may be classified as primary and secondary.



Fig. I

Fig. II-A. Bullock case No. 3640, Typical case of parotid affection with the swelling of dewlap. Note the size of the parotid swelling applied with chalk paste and the swelling of the dewlap with the neck string on.

Fig. II-B. Bullock case No. 3699. A case of injured Pharynx in the initial stage. Dull appearance with drooping ears is characteristic.

Fig. I. A typical case of injured Pharynx. Note the profuse frothy salivation and the extended condition of the head and neck. Bullock case No. 3865.



Fig. II-A

Fig. II-B

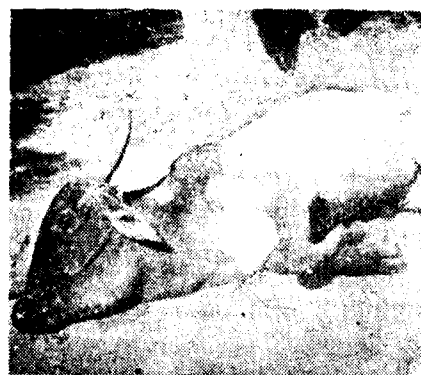


Fig. III

Fig. III. Bullock case No. 3640, same as fig. II-A. Sinking and comotose condition of the animal just on the 2nd day of admission.

PRIMARY

Lodgement of foreign bodies in or injury to—The tongue, buccal mucous membrane, pharynx, larynx, and oesophagus. The size of the foreign body varies in dimensions. Sometimes it may be small, at other times it may be big. There have been instances when a stalk of two to three feet long with its entire thickness was found folded in the pharynx. Cases of oesophageal obstruction have also been met with. Injuries of different dimensions have been seen. When the organ involved is the tongue, it is generally extensive. On one or two occasions, the tongue was found either deeply punctured up to two to three inches or cut half way across. Deep punctures were also noticed in the pharynx (Fig. No. I) causing the animal great discomfort during swallowing and breathing at the same time making the animal salivate profusely. During this time the animal holds the neck in a state of extension and totally refuses any food or drink. These affections get all right with necessary treatment within a short period.

SECONDARY

Under this head the affection may be subdivided into (1) Acute and (2) Sub-acute.

1. *Acute*. These comprise formation of painful swellings at the sub-maxillary, sub-lingual, parotid and sub-laryngeal regions. Occasionally they extend to the region of the dew-lap also. These swellings sometimes prove very serious depending upon the seat of occurrence. For instance, when they occur in the parotid region, the whole gland gets sloughed and it takes a fairly long time to heal. When it occurs in the region of the throat, it interferes with deglutition. When it occurs near the larynx, breathing becomes difficult and in one case (Case No. 3640) which had an extensive swelling of the throat and dew-lap in addition to the affection of parotid (Fig. No. II-A), the animal died of asphyxia. On post-mortem a piece of straw of about $\frac{1}{8}$ " breadth and 2" length was found deeply embedded under the pharyngeal muscles.

2. *Sub-Acute*. These comprise formation of abscesses which occur in the same regions as the above with more serious consequences.

ANIMALS AFFECTED

The animals affected are as a rule working bulls and bullocks:—occasionally milch cows, heifers and she-buffaloes and rarely calves. The affection may be said to be totally absent in other animals. This may be due to the undue attention paid by the ryots to their working animals. The following gives the number of animals affected under each class:—

Bulls and bullocks—122, Cows—32, Heifers—14, she buffaloes—8, Buff-calves—2.

SEASONAL INCIDENCE

The following three tables A, B and C give respectively the number of cases treated at the Veterinary Hospital, Madanapalle, during the various months for a period of two years from January 1939 to December 1941 for the different types of affections enumerated above.

TABLE A

Showing the Month-wise Number of Cases treated for Primary Affection due to Jonna Feeding in the Veterinary Hospital, Madanapalle, from January 1939 to December 1941 (3 Years)

Kind of affection	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Foreign body in the tongue ...										3		1
" " Buccal M. M. ...										4		
" " Pharynx ...	1											
Ulcer tongue ...											11	7
" Buccal M. M. ...										5	16	6
" Pharynx ...	4	1								2	13	10
Oesophageal obstruction ...										2		1
Total ...	5	1								16	40	25

TABLE B

Showing Number of Cases treated for Secondary Affections—Acute

Kind of affection	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Inflamed Sub-lingual ...	2	4	1							3		2
" Sub-maxillary ...	5	4	3									3
" Parotid ...		3								4	3	3
" Throat ...		1	1							1	1	
" Dew-lap ...		2										
Total ...	7	14	5							8	4	8

TABLE C

Showing No. of Cases treated for Secondary Affections—Sub-Acute

Kind of affection	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Abscess Sub-lingual ...					1	7	5	2				
" Sub-maxillary ...					1	7	4		1			
" Parotid ...					1	2	3	1	2			
" Throat ...					1							
" Dew-lap ...				1		6						
Total ...				1	4	22	12	3	3			

Grand Total 178.

TABLE A.—From Table A it is seen that the primary affections start during the month of October and end with the month of January and this period exactly coincides with the jonna season in these parts of Anantapur and Chittoor Districts. The total absence of these affections in other months and the close concurrence of occurrence of the same with jonna season go to prove beyond doubt that these ulcers in the various parts of the mouths are caused solely by hand-feeding with jonna straw.

TABLE B.—This gives the month of occurrence of inflammatory swellings in the various parts mentioned therein. These start almost simultaneously with primary affections, *i.e.*, during the month of October but extend upto March, *i.e.*, 2 months beyond the primary affection. The seat of occurrence also is just the same as that of the primary ones. The acute nature of the swelling, the concurrent commencement with and their close proximity to the seat of occurrence of the primary affections clearly indicate the close relationship that exists between the former and the latter. Hence it is seen, that the swellings are nothing but the extension of inflammation from the primary ulcers.

TABLE C.—It gives the formation of abscesses which begin in April and end in September. They are found to be totally absent during the period from the October to March.

It is very interesting to note, therefore, that while the first two groups of affections occur during the months of November to March—the third group occurs during the months of April to September—the logical conclusion being that while the primary ulcers and inflammatory swellings mentioned in Tables A and B respectively get healed up or subside with immediate treatment, small particles of straw and other debris containing aerial contamination get deeply embedded in the tissues and they give rise to the formation of abscesses mentioned in Table C at such a distant date as 3 or 4 months from the date of primary injury and infection. This intervening period of 3 to 4 months is probably the time taken for the development and maturity of the abscesses. Thus we see that the ulcers give rise to the formation of swellings, and the swellings in turn give rise to the formation of abscesses thereby showing a connecting link between the first and the second and the second and the third.

DIFFERENTIAL DIAGNOSIS

In the initial stages of injuries to the mouth, tongue and pharynx, from the extremely dull appearance of the animal and profuse salivation, the affection is liable to be mistaken for any one of the specific contagious diseases like Anthrax, Black quarter or Haemorrhagic septi-

caemia. But these can be eliminated easily by the absence of thermal reaction. In cases of throat swelling with stringy saliva the case presents an exact counterpart of symptoms of Haemorrhagic septicaemia. But here again, the absence of thermal reaction and the fairly chronic nature of the ailment are the guiding factors in the correct diagnosis of the condition. Post-mortem examination is another deciding factor. The swellings in these areas when incised reveal changes which are purely of an inflammatory character exhibiting distinct local centres wherefrom the inflammation has extended as against the uniform sero-gelatinous infiltration without any local centres of inflammation which are commonly met with in H.S.

Miscroscopical examination of smears especially those from the heart is a guide in the further confirmation of diagnosis; Bi-polar organisms being found in H. S. and no organisms being found in the other case.

FINDINGS

1. During the period of three years from January 1939 to December 1941, 178 cases were treated at this hospital for the various affections connected with jonna-feeding.

2. The animals affected were mostly working bulls and bullocks, cows, heifers and buffaloes occasionally, and calves rarely.

3. Hand feeding with jonna straw is very common in these two districts of Anantapur and Chittoor.

4. Cases of throat swelling are liable to be mistaken for H.S. but correct diagnosis can easily be arrived at by the absence of thermal reaction and other diagnostic features.

5. While primary affections get healed up at a comparatively quicker period, the secondary ones take a long time and at times end even fatally.

6. The three different affections have a distinct period of seasonal incidence, the first two closely coinciding with the jonna season.

7. The three affections have a connecting link with one another in their order of occurrence.

Conclusion

Owners in jonna growing areas should be told not to resort to hand feeding but to have the straw cut into pieces of 4" to 6" and fed to their animals.

SHEEP HUSBANDRY IN INDIA

BY

R. L. KAURA, B.V.Sc., M.R.C.V.S.,
Deputy Director of Veterinary Services, Orissa.

(A lecture delivered at the Madras Veterinary College on 26-3-43, under the auspices of the All-India Veterinary Association, Madras Branch)

Mr. President and friends,

I consider it a great privilege that I have been invited to speak on the subject of "Sheep Husbandry in India", but I must admit that due to short notice and non-availability of enough literature on the subject to me at this place I may not be able to go into details and do full justice to this subject of great professional interest and economic importance to India. However, I shall try my best to place before you my feelings on the subject which are uppermost in my mind and for details I can suggest literature for reference to those who may be specially interested on the subject.

I would like to mention two important facts straightaway. Firstly, that our breeds of sheep in India have got great potentialities. Not only the Indian wool is the best carpet wool in the world but some of the breeds show distinct possibilities of developing the production of finer wools in this country, a very large quantity of which is, at present, imported for the manufacture of finer woollen goods and hosiery. By selecting breeding and proper feeding and management this production can be increased to such an extent as to do away with the necessity of importing finer wools. Even in evolving the world famous Australian Merino Indian sheep had been used in the foundation stock. Therefore, there seems to be every reason that we should try our best to develop our sheep so as to meet the needs of the country at least, both in regard to wool and mutton. On account of the sentimental objections to the use of beef and pork by different sections of our people mutton possesses a special position of great advantage in the food supply of this country.

Secondly, I would like to emphasize the necessity of extending our work widely to the villages and not limiting to the Government Farms alone if any appreciable improvement in wool of the country as a whole is to be effected. The farms can produce the required number of pedigreed rams for distribution, train people in sheep husbandry and try out things before introducing them into villages. But no amount of work on these farms alone is going to solve the problem. The extension work as carried out in South Africa by the Departmental Extension Officers working

for the improvement of village flocks should be taken up in this country to achieve the desired object.

Sheep are kept for wool, mutton, manure, milk and skin. Sheep breeding is a very profitable side industry to Agriculture on account of the ability of sheep to utilise for the production of wool and mutton such material as feed which would otherwise be wasted, richness of its manure and as weed-killer. Certain breeds like the Lohi give as much as 4 to 6 lb. of milk a day and the trade in karakul pelts is very remunerative. The yield of wool varies greatly in various parts of India, from 4-6 lb. in Northern India to a few ounces in Orissa per head per annum. Some of the shepherds in Orissa even do not know that sheep are maintained for wool production and they keep them mainly for mutton and manures. Some of them do not shear them at all, probably they do not think it worth the trouble, the quantity of wool being so meagre. The position in Madras is however somewhat better where the average yield of wool per head per annum is about 1½ lb., though the quality is far from satisfactory. Moreover the sheep in Orissa and South India unlike Northern India are mostly black or brown or of a mixed colour, the pure white being much less common. White wool can be coloured to any shade or colour and is therefore commercially more suitable as compared with coloured wools. Consequently there is a great scope for improving the yield and quality of wool in these parts.

For deciding upon the policy of breeding the country can be divided into two types of areas, viz. (1) where recognised breeds of sheep exist there the policy of breeding consists in the distribution of pedigreed rams of the indigenous breed suited to local climatic and other environmental conditions, for selective breeding accompanied by culling of undesirable stock and castration of scrub rams for mutton and (2) where sheep are of inferior non-descript type as in Orissa, there the indigenous stock should be graded up with pedigreed rams of a suitable breed possessing the desired characters both in regard to quality and quantity of wool and size for mutton accompanied by culling of undesirable stock, especially the males which should be disposed of for mutton after castration. In Orissa we have selected the Bikaneri which is a large-sized hardy breed of white sheep with a large yield of wool. Grading gives quicker and more satisfactory results. Upto the sixth generation only pure bred pedigreed rams should be used in grading. At this stage the indigenous blood is reduced to 1.5 per cent and the newly introduced blood reaches the level of 98.5 per cent and thereafter the male progeny if otherwise suitable may also be used for breeding purposes. For selecting a suitable breed for grading up indigenous stock one should know the various breeds existing in India and their characteristics. For this information my article entitled "Some Common Breeds of

Indian sheep" published in two parts in April 1941 and March 1942 issues of *Indian Farming* may be referred to. Probably the best way of effecting mass improvement of sheep is to create economic sheep breeding units in the villages under the supervision and guidance of Veterinary Assistant Surgeons and Stockmen and each with a minimum of 50 selected young local, preferably white ewes, of a uniform type as far as possible. The department should help the owners of these units in the selection of foundation stock, supply pedigreed rams from Government or other recognised farms free of cost, undertake the responsibility of control of contagious and parasitic diseases, advise and assist them in matters pertaining to housing, feeding, breeding, docking, marking, castration, washing, shearing, dipping and general management, and arrange with the help of the local Marketing Department to obtain a reasonable price for the wool produced and for the fat stock. In Orissa the Government have established a number of such units in every district and it is expected that if the department can assist the owners of these units in getting better returns from their sheep by adopting the modern practical scientific methods the number of such units will rapidly multiply.

For rapid improvement of wool it is essential that breeding stock should be carefully selected based on individual wool analysis as is being done in other wool producing countries. In India the late Mr. Bruen applied this on flocks at the Government Sheep Breeding Farms in the Province of Bombay with excellent results. Detailed analysis of wool should be carried out in the case of all rams selected for breeding. For this samples of wool have to be collected from neck, withers, shoulders, side, back britch and belly and should be sent to the Wool Analysis Laboratory in the Province or to the Technological Laboratory for Wool Research, University of Bombay. Such a detailed analysis of individual ewe under village conditions is neither practicable nor necessary. The most significant defect in Indian wools from commercial point of view is medullation. Unlike hair, true wool fibres have no medulla, and it is necessary that ewes with high percentage of medullated fibres should not be selected for breeding purposes. A fairly good idea can be obtained in regard to approximate percentage of medullation, after a little experience, by immersing a lock of wool to be examined along with a lock of known superior wool without medullation for comparison, in benzene in a petri-dish placed over a black surface, having a refractive index of 1.49 (true wool fibres have the same refractive index). In a large petri-dish a number of samples can be examined simultaneously. The fineness, crimp, irregularity of fibres and harsh or smooth handle of the wool can be roughly estimated by sight and touch after gaining some experience. Such a rough examination and benzene test should be enough for selecting suitable ewes for breeding in the sheep breeding units and culling of undesirable ones.

Under village conditions it is usual to run rams with ewes all the year round and for the ewes to lamb at odd times throughout the year. It is better to regulate the breeding so that lambing may take place under favourable climatic conditions and when plenty of grazing is available so that lambs have better chances for their growth and development with low mortality. The rams should therefore be allowed to run with ewes only during the fixed mating season and that too only at night. During the day while the ewes are out for grazing the ram should be kept separate so that they are not unnecessarily worried in the pasture. Moreover it is better that ewes should be bred from only once a year as one good lamb a year is better than two bad ones, and the system involves less strain on the ewes and allows them to grow better wool.

Housing need not be expensive. All that is necessary for a unit of 50 ewes is to have an enclosure measuring 50' x 60' with a thatched shed inside measuring 20' x 15' supported on brick pillars and wooden beams and open on all sides. Suitable feeding and watering troughs and a rock salt lick should be provided in each shed which should be kept clean and the manure etc. removed every morning after the sheep have gone out for grazing. Under mixed farming if the cultivator finds that a particular area of his farm under cultivation has not yielded a good crop, sheep may be penned there temporarily, without constructing any shed, to enrich the soil.

Sheep should be fed economically. When sufficient grazing is available no extra feeding is necessary. Stall feeding is required during the period of scarcity of grazing when three to four pounds of green fodder or silage per head may be given daily. Cheap locally available concentrates 4 to 6 ozs. per head per day may be fed with advantage for about a month during the mating season for flushing the ewes in order to increase the percentage of fertility, and for about a couple of months during the lambing season for producing strong healthy lambs. Rams should, however, be provided with 8 to 12 ozs. of concentrates per head per day throughout the year to maintain their health and efficient service. Young stock should be grazed separately from the adult stock as the latter may carry various kinds of parasites without showing any clinical symptoms and contaminate pastures with their ova and larvae which may produce serious results in the more susceptible young stock. At the pasture it is necessary to provide shady trees where sheep can rest during the hot part of the day and clean supply of water where they should be taken thrice a day during summer months and twice a day during winter months.

Washing, shearing and dipping of sheep are usually done in succession. Sheep are usually washed 3 or 4 days prior to shearing on a sunny day in order to clean the wool. But this process, however, reduces the gross weight of the wool obtained per head and the Indian market in general

does not offer a better price for the wool obtained from washed sheep. It is, therefore, obvious that the marketing side should be developed so as to get better price to the producer of wool from washed sheep, otherwise washing of sheep would be uneconomical to him. Shearing is an art and it should be done by trained shearers with suitable hand clippers or shearing machines. Under village conditions it is more convenient to use the former. Body wool which is superior should be kept separate from the belly, face and leg wool commonly known as skirtings. Coloured wool should not be mixed with white wool. Lamb wool fetches better price and should therefore be kept separate from that obtained from adults. The best seasons for shearing, which should be done twice a year, are March-April and September-October, the object being neither to shear them when it is too cold nor to allow the coat to remain on the body when it is too hot. Within a few days after shearing the sheep should be dipped in a suitable dip. McDougall's non-poisonous dip or Cooper's arsenical dip may be made use of, but in the absence of these patent dips lime and sulphur dip or arsenical dip can be locally prepared, which should however be tested under local condition on a few animals before putting it to a general use. Either circular 'pucca' dipping tank with a space in the centre for an attendant to stand for immersing the heads of sheep while they are swimming in the dip or a portable rectangular metal dipping vat in which only one sheep can be dipped at a time may be made use of. Dipping after shearing has the advantage that the external parasites are better exposed to the action of the dip and there is less wastage of the dipping solution.

As regards the diseases I do not wish to take much of your time on this subject though their control is of paramount importance for the success of sheep industry. I have submitted an article dealing with diseases and pests of sheep in India and their control to the Imperial Council of Agricultural Research for publication and I hope it will be in one of the issues of the Indian Journal of Veterinary Science and Animal Husbandry before long. The control of parasitic and contagious diseases of sheep requires our special attention and I would briefly touch upon the various conditions caused by parasites, bacteria, and virus. It may be stressed here that prevention is better than cure in dealing with these diseases. In the event of an outbreak of any contagious or parasitic disease it is advisable to change the pasture at once.

A. Parasitic Diseases

1. **External parasites**:—Such as mites, lice and ticks. Regular dipping in a suitable dipping solution twice a year after each shearing almost ensures freedom from them.

2. **Parasitic gastro-enteritis**:—Regular drenching with copper sulphate and Colman's mustard solution or copper sulphate and Kamala or

copper sulphate in tobacco infusion once a month during the rainy season and once in two months thereafter should keep the flock reasonably free from the round and tapeworms of the gastro-intestinal tract. Tapeworms of sheep are unarmed and therefore are easily expelled with the same mixture.

3. **Somatic tapeworms** :—These are the cystic stages of tapeworms of the dog, e.g., *Coenurus cerebralis* found in the brain and spinal cord of sheep causing 'Gid', *Cysticercus tenuicollis* found in the mesentery and peritoneum of sheep and *Echinococcus granulosus* found in the liver and lungs of sheep. They can be controlled by reducing the number of dogs on and about the sheep farm to the absolute minimum, preventing them from visiting slaughter houses and eating the meat or offal containing cysts and treating them for intestinal tapeworms two or three times a year when their faeces containing the expelled worms should be properly disposed of.

4. **Liver fluke** :—In areas where liver fluke infestation is common carbon-tetrachloride should be administered to sheep at 1 c.c. dose either in capsule or in 4 c.c. of liquid paraffin and the intermediate host (fresh water snails) should be destroyed either by manual collection if labour is cheaper or by the addition of copper sulphate in local ponds, ditches, etc. in the proportion of 1 lb. for every 200,000 gallons of water. The low lying wet pasture should be drained, infected pastures should be avoided and clean drinking water should be provided.

5. **Hoose or husk** :—The lung worms at certain stages in their life history pass through the gastro-intestinal tract of the host and regular drenching with parasitides have also a beneficial effect on the control of these parasites either by the direct action of the drug on them or by the ability of the host to resist them better when the parasites of the gastro-intestinal tract are controlled. Fumigation or intratracheal injections with vermicides are also made use for either killing and expelling these worms from their habitat. Iodine is said to have a specific action on these worms and its solution can be used in the form of intratracheal injections which should be carefully given.

6. **Oestrus ovis** :—Its prevention consists in keeping the nostrils of sheep clean by washing them daily once in the morning before sending them out to graze or by applying a fly repellent to the nostrils, during the fly season so that the sheep nostril fly does not deposit eggs on the nostrils. The latter can be done by the well-known method of applying tar to the holes specially made in a covered feeding trough through which each sheep must insert her mouth to get at the ration and thus get the outer surface smeared with tar. When the larvae have established themselves in the nasal cavities, etc., it may be difficult to dislodge them before they have

completed their resting period which last for about 8-10 months. Some however recommend the injection of an antiseptic fluid e.g. 1 oz. of 3 per cent solution of saponified cresol (lysol) into the nostrils of infected sheep which kills the larvae and causes local irritation resulting in sneezing and their expulsion.

7. **Maggots** :—During the fly season myiasis producing flies cause a great trouble if wounds are neglected. The wounds should therefore be properly dressed and kept covered especially during the fly season. If maggots are found infesting a wound turpentine and chloroform (1 to 4) may be used for killing them. They may then be removed by means of a pair of forceps and wound dressed. During rainy season special care should be taken to keep the hind quarters of sheep clean (crutching) otherwise flies will be attracted.

B. Contagious diseases

Anthrax, Haemorrhagic-septicaemia, Black-quarter, Rinderpest and Foot and Mouth disease also occur in sheep and their control does not differ from that in cattle. They may spread the disease to cattle and vice versa. For the first four we have sera for use in actual outbreaks and vaccines for active immunisation. Tuberculosis and Johne's disease have also been recorded in sheep in India but they have not been reported to cause any serious loss amongst them. There are however some contagious diseases which particularly affect sheep :

1. **Sheep-pox**. Sheep can be protected against this disease by any of the well-known methods, e.g. ovination, i.e. cutaneous inoculation of sheep with material obtained from the vesicular stage of a mild case of sheep-pox or by the inoculation of sensitized (serumised) virus which has to be prepared by a competent veterinary officer in the field. Both the methods have been tried by the field officers in certain provinces with satisfactory results. But it is much safer and convenient to use the glycerinated vaccine issued by the Imperial Veterinary Research Institute, Mukteswar, which should be applied on a scarified portion of the skin on the under surface of the ear.

2. **Contagious aphtha** :—This disease is very common on certain farms in India, is caused by a micrococcus and is characterised by the formation of vesicles leading to ulceration on the buccal mucous membrane and the lips of lambs which may transmit the infection to the udder of their dams. The lesions may extend from the mouth further down the gastro-intestinal tract or the respiratory tract with consequent symptoms. Excepting isolation of the affected animals, separation of ewes from the lambs, disinfection of the premises and utensils, etc., antiseptic treatment of the lesions and internal administration of febrifuges and tonics nothing else specific is known as yet to bring this infection under effective control.

3. **Foot-rot:**—It is of two kinds, viz., non-contagious, which is associated with wet and filthy premises and starts from the solar aspects of the foot and the contagious form which appears in the form of vesicles round the coronet and works downwards through the sensitive laminae. The control of the former consists in providing clean and dry quarters for sheep, trimming the out-growing hoof and passing them through antiseptic foot-baths after they have been driven through water to cleanse their feet. The control of the latter consists in segregation of the affected animals, disinfection of the premises and application of a mixture of one part of carbolic acid in 10 parts of glycerine or one part of iodine in 20 parts of vaseline to the lesions.

4. **Caseous lymphadenitis (pseudo-tuberculosis):**—It is a chronic infectious disease of the lymphatic system caused by a bacterium (*Corynebacterium pseudo-tuberculosis ovis*) runs a slow and insidious course and is fairly common in India. Most of the cases are usually detected on *post-mortem* examination. The affected animals show enlargement of the superficial lymphatic glands and those in the internal organs. These glands are inflamed and undergo necrosis. They are filled with homogenous yellow cheesy material. The lungs, liver, kidneys etc. may be studded with small pea-sized nodules and the liver and spleen may contain one or more nodules showing the same characteristic features as seen in the affected lymph glands. Along with pneumonia chronic pleurisy and lung adhesions are often present. No effective method of control, except perhaps some reduction in incidence with general sanitation, has so far been evolved. It needs further investigation.

5. **Encephalomyelitis:**—Symptoms resembling circling disease of sheep known to be caused by *Listerella* organism has been reported several times from South India but repeated attempts made at the Imperial Veterinary Research Institute have failed to show the *Listerella* organism from the material supplied. The histopathological examination has, however, revealed that lesions in the brain and spinal cord are similar to those found in encephalomyelitis of virus origin in other species of livestock. Unless the correct etiology is established effective methods of its control cannot be evolved.

6. **Contagious abortion:**—Every case of abortion on a farm should be suspected for contagious abortion and necessary precautionary measures taken accordingly, viz., isolation of the aborted animal, washing out her genital tract with an antiseptic solution and thorough disinfection of the premises. The aborted foetus, placenta and other infective material should be burnt. Biological control will depend upon the type of organism responsible for which the aid of a laboratory should be sought.

Mastitis, navel-ill and white scour also occur in sheep and should be dealt with as in other species of livestock.

Another important item in sheep husbandry is the defect of wool which one must know before he can proceed to eliminate them. The quality and quantity of wool produced may be adversely affected largely due to defective feeding, carelessness in breeding, bad management and parasitism. It is therefore necessary that due attention should be paid to keep off the defects caused by these four important factors.

(i) **Defects associated with defective feeding:**—One of the most serious defects in wool is medullation which makes the fibre hard and thick which sticks out when yarn is prepared and does not take the same colour as the normal wool fibre thereby giving a rough surface and uneven colouring to the finished product. It has been shown that medullated fibres are low in sulphur content. It is therefore possible that there is some direct correlation between these two. If there is a natural short supply of protein sulphur (cystine) in the blood-stream then it is likely that the large-sized and quicker-growing fibres will be the first to suffer from this deficiency and so produce medulla (hollow space). Low sulphur in pastures can be remedied by manuring the pastures with ammonium sulphate.

Variation in diameter of a wool fibre may be noticed in a partially medullated fibre. In other cases it may be due to a period of semi-starvation, e.g., non-availability of pastures when there is considerable thinning of the fibres near the base which causes a weak spot in the fibre. Irregularities in feeding may also affect the soft-handling of wool and cause dead-yolk stain. It is therefore desirable to even up the food supply of sheep throughout the year in order to get proper quality and quantity of wool.

(ii) **Defects associated with carelessness in breeding:**—The following defects are probably bound up with the question of genetics and a careful breeder should breed them out of his flock by selective breeding and culling:—

1. **Medullation:**—Besides defective nutrition, genetic factor or factors may also be responsible for it as a pre-disposing cause.

2. **Variation in the size and shape of fibres without medullation:**—It is one of the contributing factors in the production of harsh handling wool and on account of which it is not possible to produce an even flat-finishing yarn.

3. **Variation in fibre length:**—The problem of short and long fibre in the same staple is bound up to some extent with the defect of coarse and fine fibres occurring together, the coarse fibres being longer than the

fine ones. This results in the final yarn not being as level and as smooth. This type of fibre irregularity is due to indiscriminate cross-breeding.

4. **Coloured fibres** :—Coloured wool on face, legs etc., should be eliminated by selective breeding.

It is, therefore, stressed that both rams and ewes for the foundation stock should be selected on the basis of quality and quantity of wool produced. The type of sheep selected should be most suitable to the locality. Rams of one particular strain should only be used so as to produce throughout the flock an even class of wool as free as possible from defects. Animals possessing undesirable characters should be culled.

(iii) *Defects associated with bad management* :—A number of defects in wool are associated with bad management, carelessness in dipping and improper handling and preparation of wool for market.

1. **Extraneous and deleterious matters e.g. :—**

- (1) *Jute and hemp fibres* picked up from dirty shearing sheds and wool bales.
- (2) *Burrs etc. from pastures*—If present these should be picked out before shearing. Pastures should also be freed from burrs.
- (3) *Colour due to sheep branding fluids* e.g. tar, paint etc. which will not scour out. If such fluids are to be used they should be such as will wash out easily and should be obtained from a reliable source.
- (4) *Pieces of skin* left adhering to the wool due to carelessness in shearing.
- (5) *Pieces of hay straw etc.* picked up from dirty shearing sheds, badly constructed feed racks or by direct access to straw or hay stacks.

2. **Baling of wool when it is damp** :—Excessive moisture causes heat to be generated and when the temperature rises the wool may be slightly charred and show a brown colouration. Such wool does not scour clean bright white and trouble may also be caused by irregular dyeing of the damaged fibres. The heat generated also causes brittleness and harshness. Therefore wool should not be pressed too soon after shearing and where possible it should be left in the bins as open as is practicable to give it every opportunity to dry.

3. **Dip-stained wool** :—It has not only a bad appearance but in some cases scour a bad colour and in extreme cases the fibre may be damaged so that a bad spin results. Faulty dipping also causes soft wool to become harsh especially towards the tip. This is usually brought about by improper mixing of dips containing carbolic derivatives although arsenical dips may also cause the trouble. Use only reliable dips which will not affect wool but will be effective against *all* ecto-parasites so as to obviate the necessity of frequent dipping. Mix the dips precisely in accordance with the manufacturers' instructions.

4. **Discoloured slipe wool** :—Slipe wool is that which is removed from the skin of slaughtered animals. Usually lime process is made use of for this purpose. Such wools due to want of careful treatment show a tendency for a slight and sometimes a marked discolouration which may be accompanied by harsh-handle. This trouble probably can be traced to the lime process and the subsequent use of acid to neutralise the lime. The use of excess of either lime or acid is detrimental to the wool, especially when it is not completely washed out.

5. **Discolouration of wool due to bacterial action** :—Blue, red, green and yellow discolouration have been traced to this source. However, as the trouble is usually confined to small areas of the wool and to a very few sheep it is seldom of any great importance.

(iv) **Defects associated with parasitism** :—The effect of internal parasites and to a lesser extent external parasites on the general health of the sheep is one of the factors limiting the total production of wool especially by young sheep, and is a contributing cause of fibre irregularity. Ecto-parasites especially mange-mites also cause serious damage to wool especially through rubbing the affected parts against fence-posts, etc. Ticks and keds also stain the wool giving it an unattractive appearance as the wool usually but not always will scour quite clean. The control of both the internal and external parasites by regular drenching and dipping with suitable parasiticides is, therefore, essential.

Along with the improvement of wool it is necessary to develop the marketing facilities so that better wool finds a ready and steady market and the producer gets a better price for it. Similarly the producer should get a reasonable price for the fat stock which should be in relation to the rate at which mutton is sold. It is no use producing fine type of wool like the Hissar-dale unless the Marketing Department organises for its consumption by the woollen mills in the country at a reasonable price. Such wool will not find a market in villages as it cannot be made use of by the cottage industry on account of its finer quality and short staple which requires improved type of machinery for cording and spinning etc. If such a system

is not adopted the price obtained by the growers will seldom bear much relationship to the ultimate value of wool and this will have a discouraging effect on the sheep industry.

Dairy cattle and utility purpose fowls have shown the most marked improvement in actual production during recent years. If the wool production is going to keep pace with the times, some form of measuring quality and quantity of wool production of stud sheep will be a necessity. The maintenance of such records of each animal at each shearing will help in the selection of further breeding stock and culling of the undesirable ones with a view to make rapid progress in the improvement of wool. For such records and those pertaining to growth and pedigree the forms advocated by the Imperial Council of Agricultural Research and circulated to the provinces should be made use of.

Gentlemen, let me thank you before I take my seat for the interest you have kindly shown in the subject by your presence and the patient hearing you have given me. I am sure that the few practical suggestions I have made will find some application at your hands in the rural areas of your provinces for making sheep breeding a more remunerative side line industry to agriculture so as to increase the income of the poor cultivator.

The Indian Veterinary Journal

. A Rare Offer!

Only a limited number of copies of back volumes are available. Fail not to get them at half the usual rate, to complete your set. Postage extra.

Full set only half rate. Spare numbers one rupee each.

Apply at once to the Editor to avoid disappointment.

THE Indian Veterinary Journal

(The Journal of The All-India Veterinary Association)

Vol. XIX

MAY 1943

No. 6

Editorial

INDISCRIMINATE SLAUGHTER

With the mobilisation of the country's manpower on a fighting basis and with the sudden increase in the strength of the Indian army, the question of feeding over a million is becoming one of paramount importance. Mutton and beef contribute the two important articles of food for the forces and the demand for these two articles is steadily rising to a phenomenal degree owing to the expansion of the fighting units. In meeting this demand, there is a great possibility that slaughter of animals may go on at a very rapid rate indiscriminately and without any consideration for the future. One of the points to be borne in mind in passing animals for slaughter for human consumption is that of conservation of livestock. Animals which have potential values either as draught bullocks or milch cows, or again animals which have breeding values should not be allowed to reach the hands of the butcher. An agency is urgently necessary to ensure this safety factor and it is up to the Civil Veterinary Departments in the different Provinces to take up this matter immediately, because the future of the livestock is the special concern of this Department.

A very regrettable feature in the meat production obtaining in this country is that there is not adequate supervision—leave alone veterinary inspection—over the slaughter of animals. Only in a very few places is there anything like a veterinary inspection of slaughter houses with the result that meat is produced

and marketed in highly objectionable surroundings and methods. The main reason for this is the fact that the majority of population are vegetarians or only occasional meat-eaters. But for the concentration of the Military Units in different parts of the country, the case is different now. Hundreds of animals are slaughtered every day in each centre to meet the needs of the forces. But we are not aware of any agency to look into these slaughters; and therefore we would urge on the authorities the imperative necessity of regulating the meat production on conservative lines.

The damages and evils of an indiscriminate slaughter are far greater in urban areas than in rural centres. The urban areas usually draw away the best milch animals from the rural parts to meet the demand for milk. These animals are kept and looked after only as long as they are profitable: the moment they become uneconomic either by diminished milk yield or total drying up, that very moment the Gowala disposes of the animal for whatever price he could get. At the present time when the price of meat is very high, the temptation for the Gowala to sell the dry or drying cow to the butcher is very great. The proposition is very attractive and remunerative. Sentiments play only a secondary part. As a result, many a good cow of a milking strain reach the slaughter house at the end of a lactating period. This has been happening even during peace time when prices were not very high. Now-a-days when prices are sky-rocketing, this practice is or has already reached a high level. And, therefore, it is high time that the salvaging of dry cows is pushed through and put into operation immediately. We understand that the Government of India have already accepted the proposal of the Central Food Advisory Council prohibiting "the slaughter of working bullocks in a good state of health below the age of ten years, cows in milk and pregnant cows". As such it should be easy enough for the Provincial Governments to organise the agency to enforce this order and thus protect the future livestock of the country. The matter is urgent, and we do hope that the question will not suffer by any delayed action on the part of the authorities concerned.



Clinical Cases

AN INTERESTING CASE OF RABIES IN A SHE BUFFALOE

BY

T. L. ANANTHARAMAN, G.M.V.C.,

Veterinary Assistant Surgeon, Coimbatore.

History: The animal, O. P. No. 1895, aged about six years, with a calf 2 months old was admitted into the hospital on the 16th of December 1942 with the history that she was not eating anything nor taking water and not allowing the calf to suck, often grunting and bellowing for a week.

Symptoms:—The animal was weak, run down in condition and appeared to be suffering from some pain as shown from the expression of her eyes and the frequent opening of the mouth. There was no secretion of milk in the udder and the animal resisted the approach of the calf and used to lie down. There was a rise of temperature 104°F. Blood smears examined showed no organisms.

Diagnosis:—A provisional diagnosis of Pyrexia of unknown origin was made and a symptomatic treatment given till the 21st when during that night, the animal died. Post-mortem showed only congestion of the different organs. The brain was sent to the Director, Pasteur Institute, Coonoor, and declared positive for rabies.

Remarks:—My idea of giving publicity to the case is for the following reasons:—

1. The diagnostic or rather the characteristic symptom of excessive salivation was not seen.
2. The animal never showed any aggressive violence or excitement except on the day of its death when it tried to attack another animal which approached it, and it is only this that induced me to send the brain for microscopical examination.

ECLAMPSIA IN A BITCH

BY

K. S. PRAKASA RAO, G.M.V.O.,
Veterinary Assistant Surgeon, Bezwada, Madras.

Subject :—Spaniel bitch, aged 2 years, in an advanced state of pregnancy.

History :—The animal was not taking food and remained inactive for the previous two days.

Symptoms :—The animal was prostrate—abdomen distended; udder well developed with only traces of colostrum—salivation—frothing at the mouth—inappetance—bowels costive—temperature 101°F.

Treatment :—Suspecting for worms, a dose of worm mixture with Sodi Sulphas exic z.1 was administered, on the first day, i.e., on 31-10-42. Next day she was brought to the hospital in the same condition but more prostrate. The bowels moved in the previous night but no worms were expelled. On the third day she was worse, with convulsions every hour—each attack lasting for about 5 minutes—grinding of teeth—foaming at the mouth and rolling of the eyes. The animal was quite conscious—the eye reflex being normal.

On the fourth day all hopes of reviving the dog to its normal health were given up. One cubic centimetre of a solution of Mag. Sulph (2 grs. in 1 ounce) was given intravenously. On the fifth day the animal was able to walk about and take milk of her own accord. On the 6th day she was discharged cured. Three days afterwards the animal gave birth to three full-grown pups. The animal is now in good health.

A CASE OF MILK FEVER IN A COW

BY

R. VEERAMONEY, G.M.V.O.,
Veterinary Assistant Surgeon, Veterinary College, Madras.

Subject :—A cross-bred cow, heavy milker, third calving.

History and symptoms :—It was reported that the cow calved on the 16th January 1943. On the 17th January about 10 lbs. of Colostrum was drawn from the udder. On the morning of 18th when the cow was moved out of the stall, she was listless, unsteady on her legs, got fits and fell down. She had refused food the previous night and also in the morning.

The cow was examined at 1 P.M. on the 18th, the third day after calving; she was found lying down with her head turned towards the flank, grinding her teeth and in a semi-comatose condition.

The temperature was 100.8°F., pulse 43, respiration 17. While being examined she got up and attempted to walk but fell down and resumed the characteristic milk fever attitude.

The history and the classical symptoms were enough to make a prompt diagnosis of milk fever.

Treatment :—A good bedding of straw was allowed and a straw pillow was kept under the brisket to afford comfort.

One dram of Calcium Gluconate in 40 c.c. of water was given intravenously. 20 c.c. of 1 in 1000 Acriflavin was injected into each teat under aseptic precautions. Air was pumped into the teats till all the quarters were fully inflated. The escape of air was prevented by tying each teat well with pieces of ordinary tape.

After 30 minutes the animal got up and took a bucket-full of gruel. The air in the udder was allowed to escape by removing the tapes.

Complete recovery in a short time after a single dose of Calcium Gluconate and inflation of udder is noteworthy. The cow is now giving its normal quantity of milk.

Conclusion :—Various treatments so far recorded in India go to show that such quick recovery has not been obtained as in the present case. Swift and energetic treatment is called for on all occasions and I would like my colleagues to record such observations.

BISMUTH SALICYLAS IN THE TREATMENT OF PAPILLOMA

BY

V. VENKATARAMAN, G.M.V.O.,
Veterinary Assistant Surgeon, Tallakulam, Madras.

Subject :—Dog, aged about 8 months, Rajapalayam breed.

Symptoms :—A crop of about fifty or more papillomatous growths was found in the mouth, inside the lips, cheeks and on the tongue and about a dozen outside the cheeks and lips. Previous attempts at removal surgically caused profuse bleeding with subsequent breaking out of fresh crops of warts.

I saw the animal on 15-10-1942 and having treated a few such cases successfully before, I got a box of six tubes of Bismuth Salicylas in Olive

Oil (2 grains in 1 c.c.—P.D. and Co.) and gave it intramuscularly one every three days. After 3 injections, the growths turned black, and showed signs of shrink. At the end of the sixth injection all of them showed remarkable shrinking. I stopped further treatment and told the owner that if after another two weeks, the growths did not disappear completely, another course would be necessary; but it was found not necessary, as all the growths disappeared by then.

As this condition is not uncommon in dogs, I request my colleagues to give a fair trial of the above treatment and record their experience.

RUPTURE OF ABOMASUM OR FOURTH STOMACH IN A COW

BY

A. H. KHAN, G.B.V.C., P.G. (Edin.)

Professor of Anatomy,

Bombay Veterinary College, Parel, Bombay.

A black and red aged Gir cow was admitted in the Bai Sakarbai Dinshaw Petit Hospital for Animals, Bombay, as an indoor patient on 29th September 1942 at about 7 p.m.

History of the case:—According to the history given by the owner, the cow bolted and jumped over an iron fencing of the neighbour's compound and was injured by the sharp pointed railing. The accident took place at about 4 p.m. The animal was brought to the hospital in the S.P.C.A. Ambulance.

Examination of the case:—On examining I found to my surprise that the fourth stomach (Abomasum) was protruding out on the right side and food-stuff was coming out from it. The protruding portion was about the size of a football. The size of the wound was about 7 to 9 inches. There were, besides the above mentioned wounds, two other incised wounds 3 to 4 inches long on the left side about 9 to 10th ribs ventrally.

From these wounds, there was profuse hæmorrhage and the animal was shivering. Pieces of ice were placed on the wounds to stop hæmorrhage and in the meanwhile, the necessary instruments and suturing materials, antiseptic lotions, cotton wool, bandages, etc., were got ready.

As there was no sufficient arrangement for powerful electric light in the cattle ward and the nearest dim light to the patient was about 20 ft. above an electric torch light was sent for and I started the operation under all the difficulties mentioned above.

A dose of chloral hydrate (1 oz. in treacle q.s.) was given.

After ten minutes the animal was gently cast on hay bed and secured in dorso-recumbent posture by tying two legs forward and hind legs backward.

With the usual precautions, the protruded portion was cleaned with Rectified Spirit and the ruptured portion of the fourth stomach—about 8 inches—was stitched with catgut. As it was found impossible to reduce the stomach due to congestion and oedema of the lips of the wound, the opening was enlarged by 4 inches and the organ reduced. Then the peritoneum and abdominal muscles were stitched with continuous suture with catgut. Lastly the skin was sutured with interrupted suture. Similarly the other two wounds on the left side were stitched. After cleaning the surrounding parts of the sutured wounds with Rectified Spirit, Tr. Iodine was painted on the wound. Lastly the wounds were bandaged with sterilized cotton wool, etc.

The after-treatment was carried out by Prof. K. B. Nair, Bovine Surgeon. I am also thankful to Prof. K. B. Nair for the care and treatment he did during the stay of the animal in the hospital. The animal was cured and discharged on 9th December 1942.

Conclusion:—I think if such cases are treated promptly and carefully, we will be able to save the life of many valuable animals.

I am very thankful to the students who helped me in carrying out this major operation so quite successful at night.

PROLAPSE OF BOWELS IN A BULLOCK

BY

V. G. KHARE, G.B.V.C.,

Veterinary Assistant Surgeon, Khambha, Baroda State.

Subject:—A Gir bullock about 7 years old.

History and Symptoms:—The animal had received a wound, on the right side of the abdomen near the flank, from a horn-thrust during a fight with another animal the previous evening.

It was brought to the dispensary walking the next morning from a village 8 miles away. A portion of the bowels was hanging with lies sitting on it. The prolapsed bowels were highly congested and soiled with dung and earth and blood oozing from it. The animal was naturally uneasy and had slight temperature.

Treatment:—Operation was undertaken immediately. The animal was secured while it was sitting on the ground. The prolapsed bowels were carefully cleansed with P.P. lotion.

A very thin paste of iodoform in liquid paraffin was applied over the injured bowels, the abdominal wound was enlarged to facilitate reduction and then the bowels were put in slowly and carefully. Then, the peritoneum and muscles were sutured with sterile catgut and the skin wound closed with interruptive sutures using silk ligature. Tr. Iodine was painted over the wound and with a dressing of dry powder, the part was bandaged.

The wound healed up without any untoward sequelae in 10 days and the case discharged cured. The owner has since reported that the animal is doing well.

A CASE OF DYSTOKIA DUE TO ASCITES OF THE FOETUS

BY

R. KUPPANNA IYENGAR, G.M.V.C.,
Veterinary Assistant Surgeon, Chittoor, Madras.

A local bred buffalo, case No. 2494, was admitted in this hospital for Dystokia on 26-10-1942. The animal was carted to this institution with the history that she could not calve and that she was in labour pains since the previous evening. The buffalo had walked about 7 miles but the remaining 3 miles she could not walk, and had to be transported in a double bullock cart. Quacks had badly handled the case. The vulva and vagina were swollen and inflamed with nail marks and much sand and mud were found within.

On examination, it was found to be a breech presentation with the hind legs of the foetus well within the vagina. Further exploration after cleaning the parts revealed high distension of the abdomen of the foetus with plenty of fluid. This distension was obviously the cause of dystokia. The foetus was fully developed but dead.

Treatment:—Having decided to tap the abdomen of the foetus, a long bovine trocar and cannula (fortunately the one in this hospital is very long and stout) was sterilised and pushed into the abdomen of the foetus and about 8 gallons of fluid were removed. The size of the abdomen having thus been reduced, it was an easy affair to extract the calf together with the placenta. The usual after-treatment to the mother was followed and she made a good recovery.

The abdomen of the calf was still large and contained about 4 gallons of fluid (vide photo below). The formation of the head, the limbs and tail were all normal. A post-mortem of the calf was conducted. The thoracic organs were all normal. An opening in the right half of the diaphragm



Photo of the foetus with ascetic fluid.

connected the thoracic and abdominal cavities, and therefore a good quantity of fluid was also present in the thoracic cavity. The abdominal organs were atrophied and were floating in the fluid. The transverse processes of the lumbar vertebrae were not fully developed, and they were all very short. The whole of the abdomen was a simple sac with fluid, the atrophied organs floating in it.

DEMODECTIC MANGE IN BOVINES

BY

R. KUPPANNA IYENGAR, G.M.V.C.,
Veterinary Assistant Surgeon, Chittoor, Madras.

This obstinate form of Mange (Demodectic Mange) among bovines is not uncommon and is seen frequently in bovines in this hospital. The affection is popularly known as "Noona Macha" and "Ennai Macha" in Telugu and Tamil parts respectively, probably because the patches present the appearance of the application of oil to the raw skin.

The history in all cases is almost the same. Round patches are reported to have been found causing no inconvenience to the animal, and no irritation or scratching is seen. The patches are reported to increase slowly in size. Affected animals are reported to mix freely with unaffected ones in the same herds for months and years, and yet, the animals are not reported to have contracted the infestation, even in a single instance.

Occurrence :—Bovines of all ages and sexes are affected. This infestation has not been observed in buffaloes.

Transmission :—“In the dog it appears to be only very slightly contagious. It is observed often in one or two among a litter of puppies although they have been in contact for a considerable time. In occasional instances, among other animals a number of animals have been discovered in a herd of cattle. Possibly there is some predisposition towards the disease required for its development”—G. H. Wooldridge's *Encyclopaedia*, pages 457 and 458. In the cattle also one has to agree with the above author, this affection being very slightly contagious. All the animals under reference belong to different owners, and in every instance, there was only one animal with this affection in a herd, and this affected animal has been in contact with the other animals, yet none of the rest got it. Particularly in a pair of animals, one was rubbing against and playing with the other for more than a year and yet its pair was free from this affection. This leads to the conclusion that some predisposing condition is required for its development.

“Infection is transmitted by direct contact or mechanical means. Artificial infection is rarely successful, probably because the condition of the host is a strong factor in determining the susceptibility”—H.O. Monnig-Veterinary Helminthology, page 384. In dogs, young age, short hairs, poor condition and debilitating diseases such as distemper are reported to be the predisposing causes. Among cattle, the predisposing factors have not been determined. Animals in poor condition though mixing freely with affected animals are found to be free from this infestation.

Symptoms :—Small round patches appear in various places or in one place, generally on the face, side of neck or ribs. Hairs are all intact, only they have become shorter in length, the skin below having lost its pigment, presenting the appearance of a part of the body over which some bland oil has been applied. Hence the name (Noona Macha)—Noona-oil and Matcha-patch. No pruritis is observed. Such patches enlarge very slowly and spread to various parts of the body and thereby become diffused with the other patches. After a long time, such union of patches involves a large portion of the skin sometimes involving the whole of one or both sides. Sometimes, the size of the patches remains constant without any further spread; probably the mites are in a state of high degree of resistance. The animals are otherwise in a perfect state of health. In cases where there is a tendency for the spread of the affection, the animal is also found to be going down in condition.

In one case, the scaly form of this affection was observed. Large portions of the body were involved, the skin was found to be wrinkled, devoid

of hair in many places and small abscesses were seen in many parts due to the invasion by staphylococci. The pustules, if squeezed out, cleared with Liq. Pot. Hydroxide and examined under the microscope were found to be rich in these mites. Sometimes, these nodules unite and form regular abscess. Such invasion by the staphylococci also leads on to further spread of the affection, and the animals soon lose condition and do not pick up in spite of rich food that may be given to them.

Diagnosis :—This is very easy in such cases. With a round patch of the description given above, one could straightaway come to a quick diagnosis as Demodectic Mange. Scrapings from such a patch always present the Demodectic species of mites. In other cases pus squeezed out of the abscess, cleared with Liq. Pot. Hydroxide and examined under the microscope is found to be rich in the mites. The mites of the bovines are observed to be much larger than those of the canines.

Treatment :—Treatment in these cases consisted of the following :—Take a stiff brush (one made of palmyrah leaf stalk will do) and rub with it a 40 per cent solution (aqueous) of Sod. Hypo Sulph. over the affected parts. Allow this to dry for about 15 minutes. Then with another similar brush rub a 5 per cent solution of Hydrochloric acid. Repeat the treatment every alternate day. Cases with a few patches become normal with 3 or 4 applications. Care should be taken to see that the solution is not contaminated with the other, as otherwise, the desired effect will not be achieved; for the sulphur in the Sodium Hyposulph will be precipitated by the acid in the other solution and penetration of sulphur into the skin will not be ensured. Even bad cases show marked improvement with half a dozen applications.

In one case, a bull, case No. 2830, only continuous rubbing of the ordinary Oleum Picis dressing was tried for many days on account of want of Sod. Hyposulph. Though this has alleviated the symptoms, the mites still persisted.

S. Jennings in *Veterinary Record* dated 15th August 1942, No. 33, Vol. 54, page 330, advocates application of a 1/20 of aqueous solution of a 25% emulsion of Tetrathelthiuram Monosulphide and claims success in Demodectic and other mites infestation. Unfortunately, this drug is not available for trial.

Conclusion :—1. No systemic disturbance is caused on account of these mites.

2. No inconvenience to the animal has been observed except in cases where invasion of staphylococci has caused pustules and abscesses and thickening of the skin with the result that there is pain and irritation.

3. Animals of all ages and sexes are affected.
4. Buffaloes have not been observed to be affected.
5. It does not easily yield to treatment with the ordinary sulphur preparations.
6. It is not very contagious.
7. The mites in bovines are much bigger than those of canines.

REFERENCES

1. Encyclopaedia of Veterinary Medicine and Surgery—Wooldridge.
2. Veterinary Helminthology and Entomology—H. O. Monnig.
3. Dr. F. Ware—Circular D. Dis. No. 1715/39 dated 10-3-39.
4. Dr. C. Gorovitz, Veterinary Record dated 2-9-39, Vol. 51, No. 35.
5. S. Jennings—Veterinary Record dated 15-8-42, Vol. 54, No. 33.

A CASE OF ACUTE CUTANEOUS GLANDERS IN MAN*

BY

G. PANJA, M.B. (CAL.), D. BACT. (LOND.)

Officiating Professor of Bacteriology and Pathology,

AND

B. C. CHATTERJEE, M.B., D.T.M., D.PH.,

Lecturer in Infectious Diseases, School of Tropical Medicine, Calcutta.

GLANDERS in man is rare in India. The Principal of the Bengal Veterinary College has reported that the disease is extremely rare here in man. Mr. Rajagopalan of the Imperial Veterinary Research Institute, Mukteswar, Kumaum, wrote to one (G. P.) of the authors of this note that he knew only of two cases of glanders in man in this country, both being Veterinarians—Professor Gaiger (1913, 1916) and Mr. Shilston. Up till now no acute cases of cutaneous glanders have been reported in India. It is partly for this reason and partly because of resemblance of this case to variola that we are making this report. In fact, the case would have been diagnosed as small-pox if a bacteriological investigation had not been made. Professor Gaiger suffered from chronic glanders of bones and joints with acute exacerbations. He suffered for 28 months, having undergone 45 operations. Mr. Shilston suffered from acute pulmonary glanders. Two cases in members of the staff of the Bengal Veterinary College are doubt-

* *The Indian Medical Gazette*, March, 1943.

ful, as no bacilli were isolated. Our case was thoroughly investigated by one of us (G. P.) from the bacteriological point of view. The report is as follows:—

Alauddin, a healthy Mohammedan male, aged about 30, was admitted as a case of smallpox to the Campbell Hospital, Calcutta. One of us (B.C.C.) doubted if it was a genuine case of smallpox and hence called the other of us (G.P.) to investigate. The patient had an eczematous lesion on the left palm, swollen and tender lymphatic in the forearm leading from the lesion, a big fluctuating abscess above the elbow, and flaccid, pustular lesion without umbilication on the arms, the face and the trunk. High temperature, coated tongue, reddish flush all over the body and marked prostration were present. No enlargement of glands was detected. The patient was semi-conscious and no history could be elicited. He died on the 3rd day after admission.

Cultures from blood, pustules and the abscess were taken during life. No post-mortem examination could be made. Smears of pus showed scanty, gram-negative rod-shaped organisms apparently capsulated. In the blood culture fluid, faint turbidity without any haemolysis was noticed in two days. The same organism was isolated from the blood, the abscess and the pustules. The characters of the organism are described below:—

Culture:—Gram negative, slender, rod-shaped, some in threads, non-sporing, non-motile (no motility seen in semi-solid agar deep at different temperatures). It forms a mucoid colony in 24 hours low convex, 1 to 2 mm. in diameter, glistening, with entire margin, easily emulsifiable; in broth, faint turbidity and no pellicle. Growth more mucoid and greyish yellow on glucose agar. Faint cafe-au-lait on potato in 24 hours. On glycerine agar—white, mucoid growth. Dorset's egg—scanty growth, confluent, showing faint magenta colour. Loeffler's serum—scanty growth. Gelatin 20 per cent.—no liquefaction. No haemolysis on blood agar. On Mac Conkey's agar after five days' cultivation, colourless colony, about 2 mm. in diameter, mucoid and of slight cafe-au-lait colour. No fermentation of sugars within 18 days. No change in litmus milk, slight alkalinity only after 18 days. Anaerobically—scanty growth. Glucose-agar shake culture—no growth seen except on the top. The organism is therefore aerobic and not micro-aerophilic. Growth slightly improved by CO₂, HS, not formed; methyl red reaction slightly positive; Voges—Proskauer reaction and Indole negative.

Control tests were at the same time put up with *Pf. mallei* and *Pf. whitmori*, and all the reactions tallied with those given by *Pf. mallei*.

Serological. A serum raised in rabbits against the organism agglutinated the organism and a laboratory culture of *Pf. mallei* to full titre (1/6400), but no agglutination was seen with *Pf. whitmori*. Similarly a serum raised against *Pf. mallei* agglutinated *Pf. mallei* and the organism

isolated to full titre (1/3200). Cross-absorption tests showed that both the organisms were serologically identical.

Complement-fixation tests with mallein and both the sera were equally positive, the one raised against the organism and the other against *Pf. mallei*.

Pathogenicity.—A male guinea-pig was injected intraperitoneally with 0.5 c.cm. of a one-day-old broth culture. It died in two days. P. M.—Congestion in lungs, slight sanious exudate in pleura peritoneum. Smears from exudate showed Gram-negative, capsulated bacilli. Cultures from peritoneum and heart's blood showed the same organism. A male guinea-pig injected with 0.1 c.cm. of the culture died in eight days with swollen testes (positive Straus reaction), nodules in the peritoneum, and positive blood culture. A dermal inoculation by sacrifice killed the animal in 21 days; there were inflamed vesicles at the site of inoculation; nodules in liver and spleen and blood culture positive. A guinea-pig fed orally with 1 c.cm. of the culture died in 10 days showing a positive Straus reaction. Rabbits injected subcutaneously and cutaneously showed ulceration at the sites of inoculation and died in 19 days. A monkey injected subcutaneously with 0.2 c.cm. of the culture died in 5 days showing ulceration at the site of inoculation, ulcers in eyes with purulent discharge, and marked emaciation; at post-mortem no naked eye changes were seen in internal organs but blood culture was positive. All these animal experiments were undertaken as soon as the organism was isolated and before it was duly identified, so that the organism might not lose its virulence in laboratory subcultures.

Our thanks are due to Dr. B. M. Paul and Dr. N. Dass for helping us in our animal serological experiments.

REFERENCES

- GAIGER, S. H. (1913). *J. Comp. Path. and Therap.* 26, 223.
Idem. (1916). *Ibid.* 29, 26.

A SHORT NOTE ON HAEMORRHAGIC SEPTICAEMIA (SUB-ACUTE FORM)

BY

P. V. DORAISWAMY, G.M.V.C.,

Touring Veterinary Assistant Surgeon, Tiruvadamardur, Madras.

Pasteurullosis among bovines is a common epidemic in Tanjore District. It appears more commonly during the cultivation season in the delta area, obviously the land becomes moist and swampy. Practically everywhere in the cultivated region, due to the low lying nature and the net work of irrigation, channels swell with water.

It may also perhaps be due to the periodical visitation of the disease in certain particular areas, that one comes across with an unusually sub-acute form of Haemorrhagic Septicaemia in bovines, as against the acute form elsewhere.

Out of the 20 outbreaks of this disease in Kumbakonam Taluk recorded during the year 1941-42, the mortality was more or less cent per cent in 18 of them; in only 2 outbreaks there were recoveries to the extent of 30 per cent. These were sub-acute or chronic form, not observed by me before or recorded in this division previously.

In these two outbreaks, the period of incubation ranged from 2 to 4 days and the duration of the disease was from 7 to 12 days. These outbreaks were confirmed microscopically. The disease subsided after Haemorrhagic Septicaemia vaccination. It belonged to the intestinal type of the disease.

Symptoms are as follows:—These animals had a slight rise of temperature 102°F. to 103.5°F. They were off feed with slight loose motions. There was no marked salivation, doughy swelling in the region of the dewlap was observed in almost all the cases. The swelling was not very hot, and on puncture with a hypodermic needle, serous fluid oozed out, which when examined microscopically was negative. There were no other marked acute symptoms. Diagnosis had to be arrived at after microscopical examination of the heart smears, which was positive for *Pasturilla Bovisepticus*.

Announcement

IMPERIAL DAIRY RESEARCH INSTITUTE

The Imperial Dairy Research Institute, Bangalore, has been authorised by the Government of India to entertain Honorary Research Workers, who are graduates of Indian and European Universities and who are desirous of carrying out research work at the Institute. Such candidates as are suitable and well qualified for dealing with a problem within the purview of the work and activities of the Institute will be selected. The number of workers to be admitted will be limited to two at present and their period of research work will not ordinarily exceed one year. The workers will be exempt from payment of any fees for the period of the research work; but they will have to make their own arrangements for board and lodging.

INDIAN ARMY VETERINARY CORPS

A further list of Veterinary Assistant Surgeons employed as V. C. Os. for duration of war and 12 months thereafter subject to the proviso that their services will be so long required.

Scale of pay Rs. 75-5-145 plus Rs. 125/- emergency allowance, if medical category 'A' or 'B' plus free rations, clothing, medical attendance, quarters, etc., etc.

Serial No.	Regtl. No.	Open Market Rank.	Name.
1.	V-297	Jemadar	K. C. Nayar
2.	V-298	"	Ajit Singh
3.	V-299	"	Har Kishan Hooda
4.	V-300	"	Karan Singh
5.	V-301	"	S. R. Lakshman
6.	V-302	"	Tej Singh
7.	V-303	"	V. G. Khare
8.	V-304	"	Saroj Kumar De
9.	V-305	"	S. K. Balkrishnan
10.	V-306	"	Balrama Bakshi

Civil Veterinary Assistant Surgeons

Serial No.	Regtl. No.	Rank	Name.
1.	V-683	Jemadar	M. S. Jayaraman
2.	V-684	"	M. A. Siddique
3.	V-685	"	Kartar Singh
4.	V-686	"	H. L. Roy
5.	V-687	"	P. Mathew Kuruvilla
6.	V-688	"	P. Satyendra Rao
7.	V-689	"	P. Sadasiva Bhat
8.	V-690	"	D. T. Parnaik
9.	V-691	"	M. Muthugopal
10.	V-692	"	Guru Datt
11.	V-693	"	Mohd. Yakub Khan
12.	V-694	"	Lekh Chand
13.	V-695	"	K. Bhattacharya
14.	V-696	"	Dharam Chand
15.	V-697	"	S. F. Deane
16.	V-698	"	Dalel Singh
17.	V-699	"	Abid Hussain Saddique

Ambala Cantonment, }
9-4-43

O.C., I.A.V.C. CENTRE,
(Record Office).



DISCOVERER OF M & B 693 MADE AN F.R.S.

The honour of the Fellowship of the Royal Society has just been conferred on Dr. Arthur James Ewins, Director of Research of the May and Baker Laboratories at Dagenham, England. This honour, which is the highest scientific distinction attainable in Great Britain, has been conferred on him in recognition of his outstanding achievements as leader of the May and Baker research team who were responsible for the discovery of M & B 693, which they followed up shortly afterwards with the very similar compound, Sulphathiazole. Since then a new remarkably interesting series of totally distinct compounds have been elaborated by Dr. Ewins and termed the 'Amidines' (in the same way that M & B 693, PROSEPTASINE, Sulphathiazole, Sulphanilamide, etc. are called "Sulphonamides"). With the introduction of the first member of this new series (which is already available commercially) M & B 744 or Stilbamidine "a very great advance has been caused in the treatment of kala-azar." (I.M.G. June 1942). Other members of this series (M & B 800 or Pentamidine, M & B 736 or Phenamidine, etc.) are at present undergoing extensive clinical trial with a view to making them available commercially in due course.

Association News

THE ALL-INDIA VETERINARY ASSOCIATION, MADRAS BRANCH

Since the beginning of the year 1943, the Executive Committee of the Association held two meetings and considered various methods of achieving the objects of the Association and also of increasing the interests of the members in the affairs of the Association.

In pursuance of those deliberations, there were three lectures under the auspices of the Association. The first of these was by Mr. F. Ware on the Role of Veterinarians, the second was by Mr. R. L. Kaura on Sheep Husbandry in India, and the third by Dr. P. M. N. Naidu on Leukemia in Fowls. All these lectures were held in the Madras Veterinary College and they were well attended by the members of the profession. The lectures were sent to the *Indian Veterinary Journal* for publication. It was also decided at one of the Executive Committee Meetings that there should be two kinds of members of the Association—one of ordinary membership paying subscription at Re. 1/- per annum and the other a life membership paying a lump sum of Rs. 10/-.

It is hoped that the life membership will appeal to a good number of members of the profession.

The collections for the Panikkar Memorial Fund organised by the Association were reviewed in those meetings, and although the response was considered satisfactory, it was hoped that the subscriptions would come in more generously so that the requisite amount of Rs. 1000/- may be collected soon.

Madras Veterinary College, }
30th April 1943. }

R. SWAMINATHAN,
Secretary.

College News

BOMBAY VETERINARY COLLEGE

Results of Third Professional (Diploma) Examination held in March-April 1943, in order of merit.

<i>Old Curriculum.</i>			
1.	Bhagwat, A. G.	13.	Thaker, J. G.
2.	Chavan, D. R.	14.	Mahantshetti, M. M.
3.	Magdum, B. N.	15.	Desai, N. N.
4.	Salvi, M. S.	16.	Vyas, K. M.
5.	More, S. V.	17.	Adkar, N. R.
6.	Mataney, C. F.	<i>New Curriculum.</i>	
7.	Patravali, P. P.	1.	Redkar, M. R.
8.	Deshpande, S. L.	2.	Bandi, G. A.
9.	Mirza, K. A.	3.	Murti, K. N.
10.	Phadke, S. P.	4.	Shrinivas, M. D.
11.	Savant, V. V.	5.	Iftikhar, Ahmed.
12.	Mansabdar, A. M.	6.	Mudholkar, D. R.

M. MOHEY DEEN, M.R.C.V.S., J.P.,
Principal,
Bombay Veterinary College.

BENGAL VETERINARY COLLEGE

Results of the Diploma Examination of the Bengal Veterinary College for the Session 1942-43 held in March 1943

<i>S. No.</i>	<i>Merit.</i>	<i>Name.</i>	<i>Place of origin.</i>
1.	1.	Janendra Malla Bujarbaruah	Assam
2.	2.	Lal Mani Dwivedi	United Provinces
3.	3.	Naresh Chandra Deb	Bengal
4.	4.	Sambhu Nath Chatterjee	Bengal
5.	5.	Jeet Narain Singh	United Provinces
6.	6.	Kapi Sharan Singh	Khairagarh State
7.	7.	Probodh Chandra Gangulee	Bengal
8.	8.	Ramgopal Mehrotra	United Provinces
9.	9.	Ram Lal	United Provinces
10.	10.	Md. Tofayel Hossain Sarkar	Cooch Behar (Bengal)
11.	11.	Nripendra Nath Mazumdar	Bengal

<i>S. No.</i>	<i>Merit.</i>	<i>Name.</i>	<i>Place of origin.</i>
12.	12.	Munzur Ahmed	Bengal
13.	13.	Md. Shafur Rahman	Bengal
14.	14.	Rabindra Nath Hazarika	Assam
15.	15.	Joseph Clement Thomas de Cruz	Bengal
16.	16.	Shambhu Dayal Singh	United Provinces
17.	17.	Mubarak Hussain	Bengal (Domiciled)
18. }	18.	Md. Abdul Momin	Bengal
19. }		Wajahat Ali Kidwai	United Provinces
20.	19.	Chitta Ranjan Biswas	Bengal
21.	20.	Muhammad Sultanul Islam Chowdhury	Bengal
22.	21.	Govinda Kishore Gupta	United Provinces
23.	22.	Mohammed Wazed Ali	Bengal
24.	23.	Chitta Ranjan Das	Bengal
25.	24.	Probhat Kusum Chatterji	Bengal
26.	25.	Abdur Rouf Meah Lasker	Assam
27.	26.	Md. Kalim Ud-Din Khan	Bengal
28.	27.	Ahmed Ullah	Bengal
29.	28.	Badior Rahman Chowdhury	Bengal

Belgachia, Calcutta, }
5th April 1943. }

A. D. MACGREGOR,
Principal, Bengal Veterinary College.

BIHAR VETERINARY COLLEGE, PATNA

Results of the Diploma Examination for the session 1942-43
held in March and April, 1943 :

1. S. S. Ahmad	15. M. R. Dauneraia
2. M. A. A. Khan	16. Maula Baksh
3. P. N. Duivedi	17. A. P. Pandey
4. S. L. Mukherji	18. R. L. Arora
5. M. R. Manroi	19. J. P. Sharma
6. R. C. Khera	20. V. N. Pargaonker
7. R. A. P. Singh	21. P. Ranga Reddy
8. K. S. Yadava	22. Nareshwar Rajpal
9. A. H. Khan	23. A. Rath
10. B. N. Prasad	24. S. R. K. Sahu
11. H. N. Roy	25. Harbans Singh
12. G. A. Laharwal	26. H. S. Jodha
13. M. A. Quasim	27. R. C. P. Yadava
14. Y. S. Rawat	28. K. C. Sinha

BIHAR VETERINARY COLLEGE, PATNA NOTICE OF ADMISSION

The next session of the Bihar Veterinary College will
commence from the 1st July, 1943.

1. Candidates desiring admission should submit their applications on the prescribed forms together with the following certificates, so as to reach the Principal on or before the 1st June, 1943. The Certificates will not be returned.

(a) Age and moral character certificate from the Headmaster of the School or Principal of the College which he last attended (true copy).

(b) University certificate or a certificate from the school or University authorities to show that he had passed the Matriculation Examination (true copy).

(c) Medical certificate of fitness from an Assistant Surgeon.

(d) Certificate from a gazetted officer to the effect that he is a Bihari or domiciled in Bihar (applies to candidates claiming Bihar domicile).

(e) Letter of identification from some well-known person stating that the candidate is known to him and the statements made in the application form are correct (in original).

(f) Letter from his guardian stating that all expenses incurred by his ward during the latter's period of study at the College will be paid (in original).

2. An applicant must be a Matriculate of a recognised University. Preference will be given to a candidate who has passed the I. A. or I. Sc. Examination. A good knowledge of English is essential. Height should not be under 5'-4'' and chest unexpanded, not less than 30 inches. A candidate must not be below 16 and over 25 years of age on the 1st July, 1943.

3. A non-stipendiary candidate will have to appear before the Governing Body of the College when called for interview.

4. Fees must be paid in advance according to the scale under rule 8 of the College rules, the initial payment due at the time of admission being Rs. 35/8 only.

5. A candidate on admission may be required to reside in the College Hostel.

6. Admission forms may be had free on application to the Principal. Prospectus will be supplied on receipt of As. 4 by money order, for each copy required. Stamps sent in lieu of money will not be accepted.

7. *For candidates from the Province of Bihar only.*—A candidate for a District Board stipend to assist him while under training at the College should apply in the first instance to the Chairman of his home district board, with necessary certificates as soon as possible so that when selected he may be interviewed and approved by the Director of Veterinary Services, Bihar, before he is recommended for admission. Such a candidate should in addition to the certificates required in para 1, produce at the time of admission a letter from the Director of Veterinary Services, Bihar, or the Chairman, District Board, concerned regarding his selection as a stipendiary.

8. *For candidates from Provinces other than Bihar and from Indian States.*—A candidate from other Provinces and Indian States should apply to the head of Veterinary Department of his province or state for reservation of a seat for him, on payment of an annual contribution by the Government of his province or state. Applications received direct from such candidates will not be considered.

9. The scale of pay of the Bihar Veterinary Service is as follows :

Provincial	...	...	Rs. 200-20/2-220-30/2-280-20/2-400/-
Subordinate (a) Veterinary Inspectors	1st Grade	Rs. 170/-	
	do	2nd Grade	Rs. 135/-
	do	3rd Grade	Rs. 100/-

(b) Veterinary Assistant Surgeons Rs. 50/- to 100/-.

(Fixed travelling allowance. Free house or house allowance if lieu thereof).

Note.—Revision of the above scale of pay is under the consideration of Government.

10. No post card will be attended to and a stamped addressed envelope must be enclosed for replies to queries etc.

PATNA,
27th April, 1943.

V. SRINIVASAN,
Officer-in-Charge,
Bihar Veterinary College.

MADRAS VETERINARY COLLEGE

Results of the Final Diploma Examination held at the Madras Veterinary College in March 1943, in order of merit

1. Brahmanandam, G.	11. Ranganathan, M.
2. Damodaran, S.	12. Ratnavelu, K.
3. Dandapani, M. N.	13. Rayappa Reddi, V.
4. Enankasekara Menon, K.	14. Srinivasamurti Rao, G.
5. Gajjan Singh	15. Srinivasan, G. S.
6. Krishna Rao, V. V.	16. Suryaprakasa Rao, A.
7. Krishnaswamy, S.	17. Vanchinathan, C.
8. Narayana Rao, K.	18. Venkataramanan, K.
9. Padmasundaram, K. R.	19. Venkatesan, C. S.
10. Prithivi Nath Bhan	20. Viswanathan, C. B.

MADRAS VETERINARY COLLEGE

PANIKKAR MEMORIAL FUND

List of Subscribers from 1-3-43 to 5-4-43

(Continued from page 274, March 1943 issue of I. V. J.)

	Rs.	A.	P.
Brought forward	624	2	0
153 Sri M. S. Ganapathi	2	0	0
154 „ Madhavan Nambiar	5	0	0
155 „ Ravi Varma Hegde	5	0	0
156 „ K. S. Ramaswami Aiyar	3	0	0
157 „ T. N. Prabhakaran	2	0	0
158 „ M. M. Chakko	2	0	0
159 „ A. Kelappan	2	0	0
160 „ B. Narasinga Rai	2	0	0
161 „ K. S. Bhuvarahachari	2	0	0
162 „ B. Venkatramanayya	2	0	0
163 „ P. Thygarajan	2	0	0
164 „ P. A. Vaidyanatha Aiyar	2	0	0
165 „ N. K. Viswanathan	1	0	0
166 „ K. Achanna Shetty (2nd payment)	1	0	0
167 „ P. V. Venkatachala Aiyar	1	0	0
168 „ J. Sitaraman	1	0	0
169 „ A. S. Mahadeva Aiyar	3	0	0
170 „ K. S. Nair	5	0	0
171 „ P. Arumugam	2	0	0
172 „ K. Kotaiya	2	0	0
173 „ M. Umapathi Rao	2	0	0
174 „ Abdul Karim Khan	2	0	0
175 „ Jagan Mohan Patnaik	2	0	0
176 „ G. Sitarama Murti	3	0	0
177 „ O. Hanumantha Rao	2	0	0
178 „ K. V. Satyanarayana	2	0	0
179 „ P. V. Govinda Rao (2nd payment)	2	0	0
180 „ Y. Ramanujam	2	0	0
181 „ A. Suryanarayana	2	0	0
	690	2	0

R. SWAMINATHAN,
Lecturer, Madras Veterinary College.

Extract

FIFTH MEETING OF THE ANIMAL HUSBANDRY WING OF THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH

Conference of Animal Husbandry Workers

CONFERENCE RESOLUTIONS

A suggestion to set up an "Animal Health Service" which should work in villages through local health committees and a warning as to the seriousness of a certain cattle disease which has become widespread in the valley of the Brahmaputra and is believed to originate in China were features of the fifth meeting of the Animal Husbandry Wing at its recent four-day session.

Veterinary Education

A sub-committee presided over by Dr. Minett considered the problem of the training of Animal Husbandry and Veterinary workers and recommended that, apart from the education of subsidiary personnel, there was a demand for two levels of veterinary education in India—firstly that required for Veterinary Assistant Surgeons and secondly that needed for more responsible posts. The committee felt that for the former a three-year course after Matriculation and for the latter either a five-year course after the I.Sc. (medical standard) would be adequate.

The committee recommended that in each province posts above certain grade should go to men with the higher degree and that in recruiting for the higher posts the degree course should be regarded, other things being equal, as equivalent to the M.R.C.V.S., while the Army Veterinary Department should be asked to consider men with the higher degree as suitable for the King's Commission.

These and certain other recommendations of the Committee were endorsed by the meeting subject to due emphasis being laid on securing uniformity or standards in examination.

On the subject of maintaining cattle in good health, the meeting recommended the drawing up of a schedule of instructions for each locality which should cover such matters as water supply protection against inclement weather, sanitation of sheds, immunisation of cattle against rinderpest and other diseases, segregation of sick animals, raising of ducks on village ponds as a measure against liverfluke, the disposal of carcasses and the removal of unproductive stock.

The Animal Husbandry Wing recommended the training of village men and women in first aid for animals and suggested that the staffs of Livestock Department should be regarded as part of an Animal Health Service to work in villages through local Health Committees.

To breed better livestock it was recommended that the aim be to grade up village herds by supplying bulls suited to the conditions of an area which were likely to produce offspring of better draught quality with as much milk as was feasible without impairing their draught quality. The Wing recommended the starting of farms to produce the types of bulls required for each locality and that private farms should be encouraged to do likewise.

Realising that this could not be done throughout the country at once, it was suggested that at first bulls should be distributed in areas selected for intensive work and that in such areas the best cows should be selected for breeding. Their offspring from the bulls should be bought at good prices at a certain age and subsidies for their maintenance should be given.

It was felt that livestock improvement was closely related to the disposal of scrub bulls, and the meeting recommended that these should be castrated in the selected areas or removed therefrom, if necessary, by legislation.

The role of *gowshalas* and pinjrapoles was considered and it was recommended that the Imperial Council of Agricultural Research should call a meeting of representatives of important *gowshalas* to consider how their institutions could be used as an asylum for dry cows on the one hand and as breeding places of good stock on the other.

Milk and Ghee

Sir Jogendra Singh in his address asked the Wing to formulate a short-term plan for increasing the milk and ghee supplies. The opinion was expressed that this could be done on the following lines:

- (1) The increased production of food and fodder crops.
- (2) A guarantee of a suitable price based on normal prices with an increase in proportion to the increase in the cost of maintaining cattle.
- (3) Arrangements to secure that the benefits of remunerative prices reach the primary producers.
- (4) Arrangements for the purchase of ghee from nomadic tribes.
- (5) Better methods of making ghee, for example, by the supply of separators, if feasible.
- (6) The provision of funds to help producers to buy cattle and concentrates.
- (7) Arrangements for supplying cattle from areas with a surplus to areas with a deficit.
- (8) The starting of depots for the supply of concentrates at controlled prices.

Considering the preparations and practicability of standard rations for cattle in various parts of India, the Wing recommended that standards should be prepared by experts on the basis of which tentative rations should be worked out for each area according to the foodstuffs available at different seasons and for different animals. It was suggested that before cultivators

CHLOROCAIN

Manufactured by:
WILLOWS, FRANCIS, BUTLER & THOMPSON, LTD.
LONDON, ENGLAND



Sole Agents for India:
SMITH STANISTREET & CO., LTD.,
18, Convent Road, Entally, CALCUTTA.

The Local Anaesthetic of the Century

The Madras Agricultural Journal

THE PREMIER MONTHLY AGRICULTURAL
JOURNAL IN INDIA

Published at the Agricultural College
and Research Institute, Coimbatore

Subscription Rs. 4/- per annum. Single Number As. 6.

Specimen copy Free on request

Apply to
THE MANAGER,
Madras Agricultural Journal,
Lawley Road, P.O., Coimbatore.

When writing to advertisers, please mention this Journal.

DIMOLINE

An antiseptic solution of Dimol
which sterilises wounds and
immediately stops bleeding.

THIS POWERFUL GERMICIDE prepared
and standardized to an exceptionally high
bactericidal efficiency, with its special
properties of safety and convenience,
(being free from causticity, and harmful
chemicals or drugs) may be applied pure
or in any concentration to the most
delicate flesh or skin.

The solution applied as directed to a wound
will immediately stop bleeding, without
the usual smarting associated with many
antiseptic lotions of a spirituous nature,
such as Iodine, Friars Balsam etc. The flesh
and skin are not cauterised or burned by
the application, but a healthy healing is
rapidly promoted.

DIRECTIONS FOR USE

BLEEDING WOUNDS. Apply solution freely on
cotton wool, dress with lint and bandage.

FOR WASHING WOUNDS, CUTS, ABRASIONS ETC.
Dilute with four times its volume of water, use freely.

ANTISEPTIC LOTION. For general use two table-
spoonsful to a quart of water will give a lotion with
five times the germicidal properties of carbolic lotion.

Should be kept in every dispensary

Bottles of 1 oz. As. 8, 4 oz. Rs. 1-4 & 16 oz. Rs. 4/-.

The Anglo-French Drug Co. (Estn) Ltd.,
P. O. Box 460 BOMBAY.

When writing to advertisers, please mention this Journal.

were advised to adopt these rations they should be tested on a large scale under departmental supervision.

Rinderpest and Anthrax

The recent progress achieved in the control of rinderpest, anthrax and Ranikhet disease in domestic animals and poultry and the present position regarding the diagnosis and control of sheep-pox and goat-pox were reviewed. Though the incidence of tuberculosis among bovines is believed to be on the increase, the disease has not yet assumed the same dimensions as in certain foreign countries and certain suggestions were made for its control and study.

The contagious bovine pleuro-pneumonia which has become widespread in the valley of Brahmaputra in Assam is believed to originate in China. The Wing was of the opinion that the spread of the disease to other parts of the country was a potential menace, the removal of which was a matter of vital concern not only to the Government of Assam but also to the Central Government.

"Indian Information", January 1, 1943.

Review

The Physiology of Domestic Animals—By *H. H. Dukes, D.V.M., M.S., Professor of Physiology, New York State Veterinary College, Cornstock Publishing Company, Ithaca, N. Y., 1942. Cloth, 721 pages, Illustrated. Price \$6.00.*

This well-known book has reached its Fifth Edition within a decade and this fact itself shows the popularity of the author. The present edition is a great improvement on the previous edition, and it is gratifying to note that the author has included the physiology of the fowl in this edition. This should prove very useful in these days when 'poultry' is booming large in Animal Husbandry work.

Another interesting feature of this edition is the section on Endocrines and Reproduction and Vitamins. These subjects have been dealt with very clearly.

The graphs and photos are very instructive and we have great pleasure in recommending this book to the Veterinary students and also to the Veterinary practitioners to enable them to keep in touch with the latest views on the subject of the Physiology and Domestic Animals.

The publishers deserve congratulations for having done their part of the work so well.

ERRATA

In page 228, *I. V. J.* issue No. 5, under *Hymenolepis apcaris* (fig. 5) in the explanations, for Rostellum please read vaginal Canal; for ovary read vitelline gland; for uterus read ovary.

THE JOURNAL OF THE ROYAL ARMY VETERINARY CORPS

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

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

Serving other ranks, R.V.A.C., Annual subscription 7s. 6d.

Single copy 2s. each

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

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

All communications and enquiries should be addressed to :

THE EDITOR,

The Journal of the Royal Army Veterinary Corps,
ROYAL ARMY VETERINARY SCHOOL,
Thornhill, ALDERSHOT.

THE JOURNAL OF THE SOUTH AFRICAN VETERINARY MEDICAL ASSOCIATION

— PUBLISHED QUARTERLY —

This Journal is owned and published by the South African Veterinary Association of which it is the official organ.

It is devoted to matters of Veterinary interest, generally and usually contains Original Articles by Research Workers at the Onderstepoort Veterinary Research Institute as well as by Field Veterinarians and Private Practitioners. Authoritative Reviews on important subjects appear from time to time, and there are sections for Clinical Notes and Abstracts of Selected Current Veterinary Literature.

Subscription : 10/6 (South African) Post Free

All correspondence should be addressed to :

The Managing Editor,

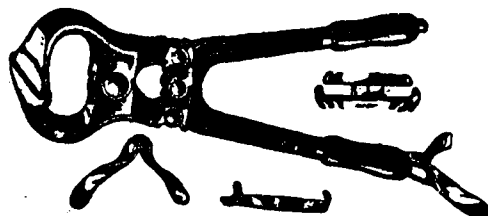
Journal for the S. A. V. M. A.,
ONDERSTEPPOORT, Pretoria, South Africa.

When writing to advertisers, please mention this Journal.

BURDIZZO

With Patent Cord-stop at Jaws

Beware of Imitations — Do not be misled by spurious m



Dr. Burdizzo's Bloodless Castrator for the Castration of Bulls — Horses — Sheep — Pigs — Dogs etc., is the only original Castrator guaranteed to be of perfect manufacture, built up to a standard not known to price.

The Burdizzo Hand Book of Bloodless Castrator should be in the possession of every Veterinary Surgeon. It is a mine of valuable information and shows the remarkable advantage possessed by the Burdizzo Method of Castration.

Illustrated Booklet free on request from

Dr. Pangal's Veterinary Institute

Representatives & Distributors

26, Wallajah Road, Mount Road P.O.,

Madras, S. India.

Printed at the Central Art Press, 14, Singanna Naick Street, G. T. Madras & Published by
Dr. P. SRINIVASA RAO, G.M.V.C., Editor, *The Indian Veterinary Journal*, Madras.