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1st May 1946.

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

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Editor:
P. SRINIVASA RAO, G.M.V.C.
Veterinary Surgeon, Madras.
Office: 26, WALLAJAH ROAD, MOUNT ROAD, MADRAS (S. INI

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NOTICE

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PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION

EDITOR:

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

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1945-46

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THE

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Original Article

TWO SPECIES OF THE NEMATODE GENUS *SETARIA* VIBORG.

By

M. M. Sarwar,
Department of food, New Delhi.

(With 3 plates)

Since Boulenger redescribed *Setaria digitata* (v. Linstow 1906) in 1920, opinions questioning the validity of the species have been advanced by various workers and *S. digita* is now considered a synonym of *S. cervi* (Rud. 1819).

Schwartz (1926) after carefully examining a large number of specimens of *S. cervi* found variations in the peribuccal ring and the tail of the female which led him to doubt the possibility of separating *S. digitata* from it.

Thwaites (1927) accepts *S. digitata* as a distinct species and states that it is evidently closely allied to *S. cervi*. He differentiates the species as follows:—

Lateral lips crescentic; tail of female tipped by an irregular circle of spines.....*S. labiato papillosa.*

Lateral lips more triangular in outline; tail of female terminating in a smooth knob.....*S. digitata.*

Purvis (1931) working on Malayan material from the water-buffalo and ox concludes that *S. digitata* is a synonym of *S. cervi*. He finds that the points advanced by Boulenger (1920) for identification of the species *S. digitata* are inconstant. He does not find any triangularity of the lateral lips in *S. digitata* and considers the soundness of the point to be doubtful at the merit of Boulenger's own wordings, 'lip like projections... frequently almost triangular in shapes'. According to him the summits of

(Paper read at the 31st Session of the Indian Science Congress held in 1944)

lips vary from being convex to their being indented. Spines at the tail vary from those described by Boulenger to their being absent altogether and replaced in certain individuals by an irregular surface or terminal knob.

The writer after studying the material collected from buffaloes and cattle has come to the conclusion that *S. digitata* is a distinct species and not a synonym of *S. cervi* as suggested by authors referred to above. The material is fixed and preserved in cold and hot 70 per cent alcohol and cold and hot 5 per cent formalin. In the fifteen collections the author is satisfied that he has all the individuals representing the different points of variations pointed out by workers quoted above and hence believes that the material is sufficient for study. In the following pages the author has adhered to the terminology proposed by Boulenger with regards the following points of comparison :—

1. Shape and structure of the peribuccal ring and the lip like projections.
2. Shape of termination of tail.
3. Shape of appendages.

Purvis (1931) considers the shape of lateral lips as quite an insufficient character for differentiation of the species. The writer in his study of both the species has found the shape and structure of certain parts of peribuccal ring and chitinosus lip-like projections as reliable for identification. In the writer's material there are individuals of *S. digitata* having teeth with their summits convex as well as indented. Even in a single individual one tooth has a slight indentation at its summit while the other has a convex one. In individuals identified as *S. cervi* the summits have slight as well as marked identations. What is constant as regards teeth in both the species is their size and disposition. In *S. cervi* each tooth appears to consist of two divergent pieces arising from a single root and when viewed from the dorsal or ventral aspect covers both the chitinous projections and is at least always larger than one projection. In *S. digitata* each tooth gives the appearance of a whole piece inspite of identations and when viewed dorsally or ventrally is not sufficient to cover even one chitinous projection Teeth in *S. cervi* are double the size of those in *S. digitata* and can be best compared against the chitinous projections.

The height of the medial or notched borders of the projections is so nominal in *S. cervi* (Plate 1) that the teeth appear triangular (Plate I,c. dotted). The appearance is also shown by Boulenger (fig: I,c. 1920) and Thwaites (fig: 2, a...1927). In *S. digitata* the depth of the notch or the height of the medial border of the chitinous projectian is large enough to give each tooth a quadrangular appearance (Plate: 2, A. dotted). The

height of the notched medial border is constant even in most distorted individuals in both the species.

The shape of appendages has not been taken into consideration previously and the writer finds that individuals referred to as *S. cervi* possess conical appendages while those of *S. digitata* are oval in shape.

The shape of the termination of the tails has been questioned as a determinative factor. In plates I and II is shown the range of variations to which the shape of terminal parts is subject. In *S. cervi* the shapes of the termination vary from their being studded with spines to their being roughly rounded. In *S. digitata* they vary from the presence of a well defined knob to its presence as a vestige only.

There is no resemblance between the shapes of the tails in the two species. In *S. digitata* the knob is a separate organ and is preceded by a neck at its junction with the rest of the body, while in *S. cervi* the end of the body is modified in different ways.

In the collections there are 3 males belonging to the species *S. digitata* and 6 of *S. cervi*. The spicules in both the cases are constant in shapes. The spicule of *S. digitata* is smaller and has a head-like anterior end with a neck proceeding it (Plate III, A).

A single female specimen belonging to the species *S. cervi* was recovered from a sheep. This is the first record of the species occuring in this animal.

Host. *Ovis aries*
Habitat. Peritoneal Cavity
Locality. Izatnagar U. P.

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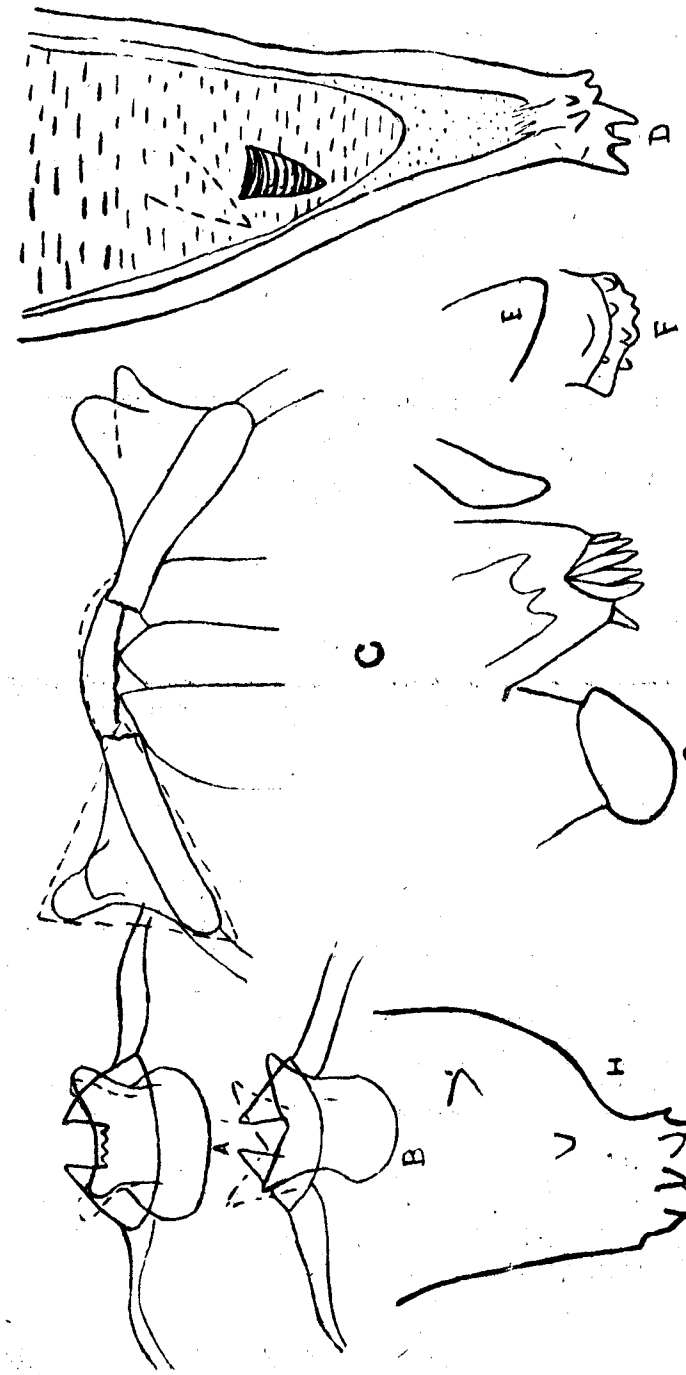
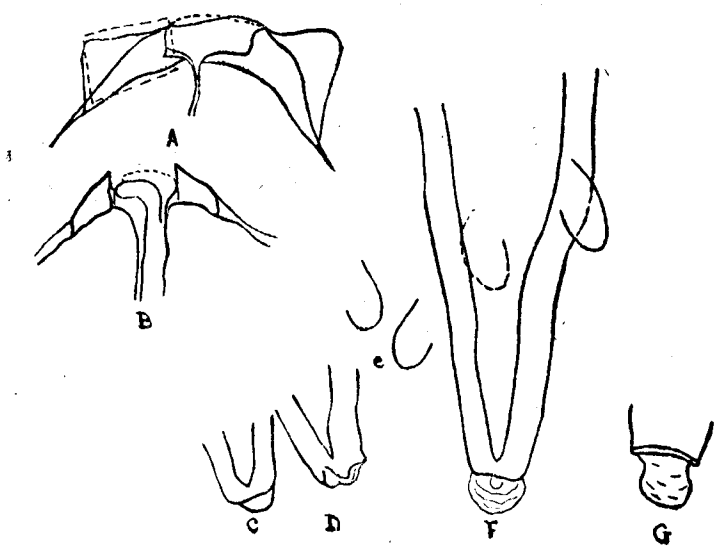
Plate I



SETARIA Cervi: A and B, Anterior view (dorso ventral). C, Anterior and (lateral view). D, F. & G. Posterior ends; E. Appendages; H. Posterior end of the female recovered from sheep.

(*Camera lucid drawings*).

Plate II



Setaria digitata: A. Anterior end, lateral view; B. Anterior end, dorso ventral view; C. D. F. & G. Posterior ends; E. Appendages.

(*Camera lucid drawings*)

Plate III

A & B, Spicule and anterior and (Setaria digitata); C. Spicule (Setaria cervi).

(*Camera lucid drawings*).

General Articles

AN EXAMINATION OF RECORDS OF CASES OF DISEASE, INCLUDING NEOPLASMATA, OF THE ALIMENTARY SYSTEM IN DOMESTICATED ANIMALS.

By

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

Department of Pathology, Bacteriology and Meat Inspection, Royal (Dick) Veterinary College, Edinburgh.

> Time and labour are required to convert the foot-path into a road; but the one may show the direction the other may take. D.C.M.

It is important to remember that all the animals now under consideration were affected with disease of some sort. As already pointed out in previous articles, the negative cases have been removed. Table I shows the number of diseases, the number of cases, and the total number of animals among which diseases of the alimentary system were found.

TABLE I.

ALIMENTARY SYSTEM.

Diseases.	*Cases.*	*Animals.*
48	527	3189
10	32	278 horses
19	54	1325 oxen
21	79	211 sheep
15	34	100 pigs
19	190	894 dogs
14	70	185 cats
4	6	20 goats
5	34	83 foxes
6	18	56 rabbits
2	9	37 other animals

TABLE II

ALIMENTARY SYSTEM.

DISEASES	Horse	Ox	Sheep	Pig	Dog	Cat	Goat	Fox	Rabbit	Other Animals	Total
Ring in tongue ...				1							1
Ulcer, tongue ...						1			1		2
Fistula, oesophagus ...	1	1									2
Impaction ,, ...			1		1						2
Stricture ,, ...	1										1
Congestion abomasum ...		3	1								4
Necrosis ,, ...		1	1								2
Abomasitis ...		6	2								8
Wool ball in abomasum ...			1								1
Gastritis ...	3			2	17	3			6		31
Dilatation stomach ...				1	3	2					6
Congestion ,, ...				1							1
Induration ,, ...		1									1
Ossification ,, ...				1							1
Ulceration ,, ...		2	1								3
Injury rumen ...							1				1
Gastro-enteritis ...		5	5	3	43	20		1			77
Pneumo-enteritis ...			1	4	4						9
Enteritis ...	8	10	25	9	39	26	2	22	4	7	152
Impaction alimentary ...		4	6	5	6	1	1	3	4		30
Congestion intestinal ...						1					1
Catarrh ,, ...		1									1
Intussusception ,, ...	1		1		2						4
Oedema ,, ...		1									1
Ulceration ,, ...	1	3			2						6
Congestion caecum ...			2								2
Colitis ...										2	2
"Gut-tie" ...				1							1
Volvulus intestinal ...					1						1
Prolapse rectum ...					1						1
Peritonitis ...	1		1	1	2	2	2				9
Amyloid liver ...	1										1
Cirrhosis ,, ...		3	6		4	1					14
Congestion ,, ...		1	1		2						4
Diseased ,, ...						1					1
Fatty ,, ...		2	11	1	4	5					23
Jaundice ...		1			2			7			10
Perihepatitis ...				1							1
Biliary calculus ...		1									1
Impaction, gall bladder ...									2		2
Coli-bacillosis ...		1									1
Milk sickness ...			4								4
Indigestion ...			1			2					3
Ossification peritoneal ...			1								1
"Bracken poisoning" ...											1
Ulceration, tonsil ...					1						1
Abscesses ...	5	2	3			1			1		12
Tumours ...	10	7	4	1	72	4		1			99
Totals ...	32	54	79	34	207	70	6	34	18	9	543

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

Table II may be briefly considered; in one case in the pig, an iron ring had been fastened through the entire substance of the tongue, in much the same fashion and probably for a related purpose, to the way in which a ring is sometimes passed through the snout of these animals; it was a source of considerable discomfort to the pig.

Among 48 diseases tabulated, 31 cases of gastritis—17 of which occurred in the dog—are recorded; and 77 cases of gastro-enteritis—43 in the dog and 20 in the cat. 152 cases of enteritis were distributed as follows—25 in the sheep, 39 in the dog, 26 in cats and 22 in foxes; these were all silver foxes and members of the Salmonella group were among the organisms responsible. 30 cases of impaction of some portion of the alimentary tract were met with and these, as the table shows, were fairly distributed among the animals under review. Alimentary impaction is an important source of disease in poultry and in certain wild birds kept in captivity, e.g. the rhea. (Matheson [1]) (Matheson & Wilson [2]).

14 cases of cirrhosis of the liver are recorded, 6 in sheep not associated with distomiasis and 4 in dogs; 28 cases of fatty liver were fouud, 11 of which were encountered in sheep, 10 cases of jaundice were met with of which 7 occurred in silver foxes but these were not cases of leptospiral jaundice; those cases have already been referred to. (Matheson [3]),

Of the 12 cases of abscess formation, 5 occurred in the horse and among the 99 cases of tumour formation, 72 occurred in dogs and 10 in the horse. In the case of stricture of the oesophagus mentioned in the table, the oesophagus showed a large dilatation partly filled with ingesta, immediately cranial to the stricture. Wool balls mixed with curdled milk are not uncommon in ailing lambs.

Dealing in the next place with neoplasmata of the alimentary system of the horse, the records include an adeno-carcinoma of the tongue, a polypus of the mouth, an epithelioma of the pharynx, a polymorphic sarcoma of the pharynx, an epithelioma of the oesophagus, an adeno-carcinoma of the liver with secondary growths in the lymyhatic glands, spleen and an ovary; a carcinoma widely distributed throughout the viscera in a mare, a lipoma of the mesentery and 2 fibro-lipomata of the mesentery.

With regard to tumours of the alimentary system of the ox; the records include multiple papillomata involving the tongue and oesophagus, a haemangioma of the liver, 2 adeno-carcinomata of the liver, a cylindrical epithelioma of the liver, multiple lympho-sarcomata of the mesentery, and a fibro-papilloma of the rectum.

As might be expected, neoplasmata in the sheep are relatively rare but the records include an adeno-carcinoma of the liver, 2 carcinomata of the liver, both accompanied by marked fatty infiltration of the organ; and a polypus of the reticulum. A case of multiple sarcomata in the liver of a pig was encountered.

The tumours met with in the dog include seven epitheliomata involving the mouth, gums, palate, pharynx, the latter in a Sealyham terrier, the tongue (2 cases, in one of which the growth showed secondary deposits in the lymphatic glands) and one affecting the right pharangeal tonsil. Two papillomata of the gums were encountered one of them in a seven weeks old puppy. A fibro-osteoma occured in the mouth of a spaniel; other tumours also found in the mouth included two osteomata, a hard fibroma, a spindle celled sarcoma, and a melanoma—the latter in a Pomeranian dog; a carcinoma of the pharynx in an Airedale, a carcinoma involving the right tonsil and an adeno-carcinoma of the palato-glossal fold in a spaniel conclude the series of tumours met with in these situations in the dog.

Dealing in the next place with tumours of the viscera of the dog, these include six sarcomata, viz. two involving the intestines, one of which showed secondary growths in the lungs; an osteosarcoma in a collie; two lymphosarcomata of the intestines, one of them in a six year old Scotch terrier; and a spindle celled sarcoma in a fox terrier.

The five cases of carcinoma include two involving the small intestines, one of them in a seven year old black and tan terrier; one involving the intestines, another the rectum, and the 5th the viscera of a Dalmatian dog. An epithelioma of the anus is also recorded and seventeen cases of adenoma involving the glands of the anal pouches; these included three cases in fox terriers; two in Irish terriers and one each in a spaniel, a Great Dane, a bull-dog, a West Highland Terrier, a Labrador retriever and a Scotch terrier; the breeds of the remaining dogs were not recorded.

Five cases of carcinoma of the liver are recorded, one of these in a two-year old Yorkshire terrier showed secondary deposits in the mesenteric glands. Six cases of adeno-carcinoma of the liver were met with, two in fox terriers and one in a Scotch terrier; in the other cases the breed of dog was not recorded; in two of these cases the spleen was implicated.

Six sarcomata were encountered in connection with the liver; one of these was of the spindle-celled sarcomata, affecting the liver and spleen, were met with, one of them in a cocker spaniel. Two other sarcomata were encountered, one of them in an airedale dog; secondary deposits of a mixed-cell sarcoma were met with in the liver.

Two growths, recorded as malignant, were encountered, one in the liver, spleen and heart of a collie dog, the other involving the liver and

spleen of an Irish terrier. One round-celled sarcoma was found affecting the stomach of a cat; one lymphosarcoma of the mesentery in the same animal, while generalised carcinoma was also encountered and one lymphocytoma affecting the viscera of the cat.

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VARIOUS FACTORS THAT AFFECT MILK COMPOSITION

By

L. A. P. BRITO-BABAPULLE, B.SC., M.R.C.V.S., D.T.V.M.
(*Honorary Veterinary Surgeon to the Ceylon Zoological Gardens*)

Cow's milk is not an uniform article of commerce. It varies in its composition from day to day, week to week, and *month* to month. Its composition varies with the environment, inheritance, and management in the proportion of 33%: 28%: 39%, and the factors that influence yield and quality will be dealt with *In seriatim* later. The mammary secretion of the cow, after the period of colostrum has passed, is termed Cow's Milk and it necessarily follows that it must have been hygienically produced and drawn from a perfectly healthy cow living under the most sanitary conditions. If any one of these conditions is not satisfied then the nomenclator would be wise to refrain from using the term "Cow's Milk", unless generically to typify origin.

The circumstances that affect yield and quality are :—

1. **Breed of Cow 1.**—Natural breeds of cattle not bred for production of milk only 1, usually give 600 to 700 bottles of milk per annual lactation period, *i.e.*, about 2 to 3 bottles per day, yet in the composition of their milk their percentage of solids are high when contrasted with the high-yielding strains. It does not always follow that a high-yielding animal should be always low in butter-fat content, but some breeds give a high yield with a low butter-fat content whilst other breeds yield only a small quantity but with quality relatively rich in fat. The Jersey (a low yielder) has 5·4% butter fat content whereas the British Friesian (a high yielder) has only 3·6% butter fat. The popular Ayrshires (Sires of many of the 'Cape Cows' of Colombo dairies) has a 4% fat in the cow's milk.

Average figures of many samples of milk of the following breeds of animals show the differences in constituents that exist in the various types :—

PERCENTAGES

Breed	Total Solids	Ash	Water	Fats	Carbo-hydrates	Protein
English Cows ...	13·0	0·75	87·0	3·8	4·7	3·5
Indian Cows ...	15·1	0·79	84·9	6·0	4·61	3·7
Singhala Cows ...	13·8	0·73	86·2	5·1	4·77	3·28
Local Buffaloes ...	17·7	0·75	82·3	7·5	4·8	4·1

The cultivated breeds as in the English breeds of cows, by a process of selection, weeding out of useless types, and grading up of selected animals, have been gradually raised to a standard where the average annual lactation yields in those animals approximate 6,500 bottles, and more at times, as a common feature. As Darlington points out in Discovery 1945 November, British breeds of livestock fail in different degrees to compete with native breeds in the tropics, due to inherent hereditary strength against endemic diseases. All breeds are fitted by heredity to their own country or even distinct and part of their fitness consists of resistance to disease. So the course of grading up must be selective.

The fact that cows of a particular breed give a low fat % content does not mean that their total yield of fat is low, since the yield of milk also varies with the breed. According to Tocher (Analyst 1925) working with English breeds, the Friesian cows give a larger amount of fat per milking than the Ayrshires and other breeds of cows although the average fat % of Friesian milk is 3·62, as against the Ayrshires 4·08, and our Singhalas 5·1.

2. **Individuality of Cow**—Suppose individual cows were kept under the same conditions of care, feeding to fill, and environment there will always be considerable variations in the composition of milk, some giving milk that persistently falls below presumptive standards. In the absence of pathological conditions such as diseased udders, ailments, or physiologically at the end of lactation etc., one is compelled to assume that production of such milk is characteristic of the individual cows in question. Experiments were done by Kellner on 18 Dutch cows kept under observation for 10 years the differences between the worst and best yielders, and yields, as a group, were noted as follows :—

Total milk yield	...	490·6 gls.	to	590·44 gls.	*i.e.*,	100:202
Total amount fat	...	16·37 lbs.	,,	32·84 lbs.	,,	100:201
Per cent of milk solids	...	10·56	,,	12·80	,,	100·102
Per cent of milk fat	...	2·63	,,	3·81	,,	100:145

Originally cows produced 100 to 200 gallons (1 gallon—6 bottles) per lactation average of 42 weeks, by selective breeding it has become common to have a 1,500 to 2,000 gallon animals in the temperate countries. The natural milk yield is 200 gallons per lactation but in the tropics this may be in fact very much less. Some of the cross-bred cows in Ceylon, the so-called Cape animals have had good yields of 22 to 26 bottles per day, the record being for an up-country cow that gave 33 bottles per day. In Scotland a cow called "Killoch Betsy", belonging to the Nether Craig cattle herd gave 114 pounds or 76 bottles as a record yield in 1 day of 24 hours. In a "Ceylon Daily News" of March 1941 mention was made of "Cherry" a non-pedigree Shorthorn owned by Messrs. Wort and Way of Red House Farm, Amesbury, Wiltshire, which in a lactation of 365 days gave 4164 gallons or 24984 bottles *i.e.*, about 67 bottles a day.

Besides individual variations there are observable variations in the *daily* yields of the same cow which may be as much as 4½ to 5 bottles, as well as differences in the fat percentage. The same cow may one day give milk with a 2·8% butter fat and the next day 3·9% without any radical explanation except that it is the peculiarity or individuality of the cow concerned.

The individual relations also show themselves in the alterations which a *change of food* makes in the quality and quantity of the milk. In a series of experiments with 4 identical cows where some of the carbohydrate portion of the ration was replaced by fat (actually Rye feeding meal, rich in fat, was used instead of Rice feeding meal, rich in starch) without any other changes being made in the food, it was found that :—

Cow	(*a*)	gave	3·7	pounds	more milk and		1 oz. more fat
,,	(*b*)	,,	5·2	,,	less	,,	2½ ozs. less fat
,,	(*c*)	,,	0·02	,,	more	,,	¾ ozs. more fat
,,	(*d*)	,,	1·4	,,	more	,,	¼ ozs. more fat

These observations can be made by anyone of you owners of dairies but *note* how extraordinarily changeable is the influence of individuality upon milk production. Emphasis is also laid on this salient observation of *the deceptive results of experiments carried out on a small number of animals and drawing conclusions therefrom.*

3. **Period of Lactation**—Normal cows should average a period of 48 weeks. It ranges from 39 to 45 weeks with a rest period prior to the next parturition. This period of rest averages 9 weeks. Many cows however go dry before the normal lactation period of 43 weeks, others, will milk on to the next parturition and are very difficult to dry off.

If conception does not occur a cow may go on milking for many years. In many a Wolfendhal dairy there are cows (unless Rinderpest has wiped them off) that have lactated for 1½ to 2 years or more without getting into calf.

The records in Great Britain make mention of "Old Jersey" a 20 year old cow which lactated for 15 years, giving 18 bottles of milk daily, without coming into calf. "Daphne" a 23 year old cow milked for 12 years after loslng her calf. The composition, of the milk from these animals, were normal or richer in ash content only, the rest of the constituents being the same, as average cow's milk.

With many cows the yield of milk increases for a few months after calving remaining for a considerable time at the highest yield and then falls either quickly or slowly, and remains for a period at that level. The peak or maximum is reached, on an average, in 6 to 8 weeks after calving, in good breeds of cows which are well managed and husbanded. In poor breeds and in the Ceylon scrub cattle the peak is reached in 4 weeks, and in some as early as 2 weeks after which there is a gradual decline and subsidence of lactation.

The maximum % of fat occurs 14 to 16 weeks in milk. The average after calving is about 3·97% and falls to 3·85% at about 17 weeks, after which there is an increase and at 38 weeks the average amount is about 4%. As a rule the butter fat content is unaffected in a lactation period but soon after calving the solids not fat (S.N.F.) are very high, generally due to high ash content, nnd from this high level it reaches the low level at the 20th week and then there is a tendency for a slight rise.

Sometimes when the cow is nearly dry the butter fat may be very high, but the chlorides are also very high and the lactose or milk-sugar, low with the result that the milk is salty to the taste. Mackintosh (Berkshire Farmer's Year Book 1933) found that a cow in good condition before calving with consistent good management and feeding of balanced rations will maintain a higher fat % than under conditions of careless management.

4. **Intervals of Milking**—When cows are milked twice daily at equal intervals there is little difference in the fat percentage, and milk yield, of the morning's and evening's milk, although the morning milk may be slightly greater and the percentage of fat therein slightly lower. When the night interval exceeds the day interval the fat percentage is lowered in the morning and increased in the afternoon milking.

Mackintosh (Berkshire Farmers' Year Book 1933) states that in the case of mixed milk from a herd, for each hour that the interval exceeds 12 hours, the fat is lowered 0.10 to 0.15%, and for each hour that the interval is under 12 hours the fat is raised 0.20 to 0.25%.

There can be no doubt that the passage of milk from the milk alveolii to the milk cistern, or reservoir, is easiest and most rapid when the udder is empty. When the udder is filled more or less, there is a damming in the small ducts leading from the alveolii and the pressure acting on the cells of the alveolii hinders the seperation of the milk.

Table showing variation in fat % due to uneven milking.
Percentages (Ceylon. C. Henry Botham, 1936).
All bulk samples.

Dairy Number ...	1	2	3	4	5	6
After 8 hour interval ...	6·0	4·5	6·0	5·1	4·6	5·1
After 16 ,, ...	3·6	3·5	3·2	3·1	3·6	3·4

The individuality of cows influences the results because some are affected much more, by the length of the interval than are others. It may be assumed that more frequent milkings should increase the yield but certain other factors have to be considered. Many circumstances point to the fact that the milk is formed in the alveolii under the stimulus of milking. By measurement of the cubic capacity of the ducts together with the whole udder cavities it has been computed that the average udder capacity of European breeds is about six pints, whereas at a milking twice that quantity is got. So a portion of the milk must be certainly leaving the cells of the alveolii during the process of milking. When milking is practised three times daily, at intervals of approximately eight hours, the yields of milk are in fairly close agreement with the average and with each other, but the percentages of fat are by no means uniform.

Effect of Interval between Milkings

Period of Experiment	Length of night interval	Fat %	Length of day interval	Fat %
Fourteen days ...	15 hours	2·87	9 hours	4·26
Twenty-eight ,, ...	12·5 ,,	3·18	11·5 ,,	3·8
Twenty-one ,, ...	15 ,,	2·94	9 ,,	4·4
Fourteen ,, ...	12 ,,	3·64	12 ,,	3·45
Fourteen ,, ...	16 ,,	2·33	18 ,,	4·47

With freely milking cows which give good yields and where milk can be sold to advantage it may be possible to milk four times a day with profit but in ordinary circumstances, twice at most three times is usually enough for all practical purposes. Milking twice daily increases the yield by about ten per cent. Against this increased yield there are :—(*a*) An accompanying increased labour. (*b*) Lack of rest to cows. (*c*) Extra food consumption. In a case of thrice milking the following results were obtained in a small herd under test :—

After an interval in the	Fat%	Yield in lbs.	Weight of fat per milking in pounds
Night of 12·5 hours	2·59	119·5	3·10
Morning of 5·5 hours	4·79	83·5	3·94
Afternoon of 5 hours	4·88	63·0	3·08

In the case of cows that are left unmilked, that is cows that are "overstocked" with the udder distended, part of the milk is reabsorbed. If the pressure overcomes the resistance of the teat sphincter the milk may leak through the teat. In the case of cows that are unmilked for longer periods than normal, fat may be considerably reduced thus :—

Experiment	Milked at intervals	Fat%	Difference
Cow (*a*) ...	12 hours	5·30	
	24 ,,	5·05	—0·25
Cow (*b*) ...	12 ,,	4·00	
	36 ,,	1·95	—2·05
Cow (*c*) ...	12 ,,	3·40	
	48 ,,	2·60	—0·80

5. **Efficiency of the Milker**—Milking whether done by hand or machine should be carried out gently, quickly and thoroughly as possible. It should be done rapidly as the erectile tissue of the udder gets tired (Hammond). It should be treated gently as there is a continuous action of the milk making cells of the udder and the resultant distension of the udder afford most cogent reasons why cows should always be treated gently and quietly and kept, as far as possible under peaceful and comfortable conditions. Quickness of milking saves time besides the increased output that it gives. This increase may be as much as 10% of the butter fat. Time required for milking a cow varies according to the yield and the case of milking. Cows giving a large yield may be milked at the rate of 3 to 4 pounds per minute but the average rate is 1 to 2 pounds per minute. The number of cows milked per hour should be from 7 to 9 auimals.

The composition of the milk drawn off at various times during a milking varies enormously. The fore milk, or first squirts are discarded because of the high bacterial content and poor fat. The mid and after milks contain a fair portion of the butter fat but it is the strippings, or last drawn portions that contain nearly 10% butter fat, and incomplete milking naturally loses this fat besides tending to dry off the cow.

6. **Bulking of Milk**—In any herd there are cows that usually give a high% butter fat and others with low%. So bulking the milk tends to even up to an average composition. Many Ceylon consumers like the milk of particular cows in a dairy because that milk is " richer ", and if such milk is bulked then these consumers are balked of the high fatted milk. To obtain this privilege good prices have been paid. In evening up a milk by bulking the composition of the final product varies with (*a*) Size of herd, (*b*) Thoroughness of mixing up the milk of the herd. Obviously the bulking of milk of as many cows as possible will lead to a composition being nearest the average. In a statistical analysis of prosecutions of the sale of milk, Bibbys found that 1/3 of the prosecutions were due to imperfect mixing or builking. This is often due to the simple fact that the heavist milkers in a herd are sometimes milked first and these as a rule have a low% butter fat, so that when churns or cans are filled with this milk they may be deficient in fat, as a consequence.

7. **The age of the cow**—The yield from individual cows gradually increases until about the 5th or 6th calf. In the tropics, with exceptions, at about the 3rd or 6th calf. Spier (as quoted by Crowther J. AGRIC. Sc. 1,1905) from his observations on 903 Ayrshires found the following :—

Age of cows in years	Number	Average yield in pounds	Average fat%
2	30	362	3.83
3	147	377	3·87
4	164	403	3·76
5	137	421	3·66
6	110	438	3·63
7	88	465	3·63
8	80	468	3·69
9	50	461	3·63
10	36	457	3·64
11	28	464	3·60
12	16	493	3·48
13	10	428	4·42

According the Tocher (Composition of milk H.M.S.O., 1925) the regression of the average fat% due to increasing age of cow is expressed as the equation :—

$$Fat = 3{\cdot}9842 - 0{\cdot}00312x - 0{\cdot}0094x^2$$

Where the class unit was one year and the algebraic symbol x = the age of the cow. Figures for the Singhala cow has not been worked satisfactorily.

Different breeds of cows continue to yield a good quantity of milk at various ages :—

Jerseys	...	7 years
Ayshires	...	10 ,,
Guernseys	...	9 ,,
Friesians	...	8 ,,
Singhalas	...	6 ,,
" Cape cows "	...	8 to 9 years.

Very commonly all heifers with their first calf give a high % of fat in their milk. As regards the other constituents, of milk there is a decrease in all constituents, as the age increases, except perhaps in the albumin nitrogen.

8. **Health of Cow**—Milk is usually altered in composition by digestive ailments and by diseases responsible for a fall in yield according to Bergema (Jahrb. Milchwirstschaft 1916, 30). Indisposition often causes a decrease in yield with an increase in fat %. Febrile conditions like F & M, Rinderpest, Piroplasmosis, Cowpox etc., the yield drops usually, although there may be exceptions. Tuberculin testing temporarily reduces yields. In udder diseases like Mastitis, tuberculosis etc., there is a reduction in the yield besides the pathological changes in the quality.

In drying off cows the composition of the milk varies as noted under section 3.

Exceptional conditions such as are likely to alarm or excite cows has the effect of lowering the fat content, such as when the animals are in showyards or exhibitions. In 1922, 109 cows entered for milking at the Royal Agricultural Society of England show, were disqualified for having a fat content below the standard 3%. In 1923, 92 were disqualified, in 1924, 83 and in 1925, 125.

9. **Hormones and Drugs on Lactation**—Nulliparous heifers by the subcutaneous injection of a drug called D.E.S., dipropionate can be made to come into normal milk. In a personal experiment on 4 cows treated for Rotentio Secundinarum with this drug, there was only a slight increase in milk output although the milligram dosage was 100 and 200 in several of these cases. Graham (Biochem. Journal 1934), found that secretion of the thyroir gland causes a marked increase in the production of milk fat. Folley (Procd Roy. Soc. 1936) obtained similar results by injection.

Some say that 1/1000 gramme of Iodine increases the yield of milk. There is a popular idea that in cold weather if one rugs an animal the butte fat is increased. Lead is supposed to increase the fat content probably due to an upset in the metabolism caused by the lead which is a poison. Recently experimentally thyroprotein visibly increased milk yield whereas thiouracil, the metabolic-rate, reducer, depreciated the yield.

10. **Climate & Weather**—The effects of climate and weather conditions on fat % falls under three headings :—

(*a*) Season of the year. Butter fat is lowest in the summer and highest in the winter in countries which have such seasonal weather variations. Under drought conditions the yield drops and the butter fat content is increased, the lowering of the milk composition being due to an insufficient water supply; irritation by insect pests that predominate, and the physiological action of secreting a lower calorific liquid to suit tbe naturally smaller needs of a potential suckling during the hot weather. In the Monsoonal rains when there is plenty of lush grass the cows give better yields (Fernando, C.V.A. Journal, 1944, p. 26) and are more fecund. The fat content is however lowered.

(*b*) Temperature. LLoyd (Colombo Municipal Milk Report 1939) has shown that a low fat content often follows a sudden fall or rise of temperature. Usually cold weather tends to increase and warm weather tends to decrease the fat % for every 10 degrees Fahrenheit fall in temperature.

(*c*) Sudden changes in weather. Should be taken to consideration in conjunction with the other conditions such as temperature, comfort, water and food supply, and excercise. From recent experiments it has been shown that badly ventilated byres tend to produce a butter fat lower than in byres kept cool and well ventilated. When air-conditioned stables were made in Colombo for the purpose of dry-sweating horses, a cow that was given the same diet, both in and out of this stable showed an appreciable increase in the yield, although the fat was not estimated. Unluckily faults in the air-conditioning apparatus obviated further work on this point.

11. **Work of Cows and Lactation**—Work of any kind means utilisation of energy. The infiuence of work done depends largely on the amount of food at the disposal of the cow. If the ration does not suffice for the full supply of the milk *as well as* for the work done, then in all circumstances the milk will suffer. In an experiment done on a cow made to turn a capstan for drawing up water, for 4 hours in the morning and again for the same period in the evening, the yield was lowered by 6½ bottles. But this same cow on the same ration as before but doing only light work for less than two hours a day, the yield was increased by three ounces from her normal average. Moderate excercise in the open with the avoidance of unfavourable influences is of considerable influence and benefit to the secretion of milk and therefore ought not to be neglected. Cows in India (*vide* Fernando, C. V. A. Journal 1944) have done well with moderate excercise as shown by the Hosur Livestock Research Station experiments. A moderate amount of work on a suitable diet therefore need not entail a loss or diminution of production. The quantity of milk may be reduced but the quality is better. When the work is fatiguing the milk is poorer in water, richer in dry matter, particularly fat. Hard work and a large milk yield cannot be combined, but the use of a cow for light work with a compensatory increase in ration, can be carried out with advantage.

12. **Kind and quality of Food**—In a herd that is properly fed both quantitatively and qualitatively, very little changes can be obtained by feeding,

in yield and quality. Provided the ration is balanced, kind and quality of the food has little or no effect on the butter fat content. But the question remains wheather underfeeding affects the composition of the milk. Workers at the Cornell University Experimental Farm, working with the butter fat and yield records of neighbouring undernourished herds, took over full control of such herds, for two years, fed liberally and well, and then returned them to the owners who ran it for the fourth year. The results showed that in the second and third years the yield increased 42% over those of the first and fourth years, but the differences in the fat % was only 6%.

Starvation conditions (Smith *et alia* J. Dairy Res. 1938) causes a rapid fall in the milk yield, accompanied by an increase in fat%, proteins and chlorides, and a decrease in the lactose, but the quality was affected only slightly.

The effects of changes of feeding is often overemphasised probably due to ignorance of the effects of associated factors and it is easy to attribute results to the feed. But it must not be overlooked that :—

(*a*) Continuous underfeeding produces less milk with a slightly less fat than cows would give under adequate feeding.

(*b*) Continuous overfeeding fmproves condition and maintains the yield but does not cause high fat percentages.

(*c*) Change to pastures, means an increase in digestible protein, exercise and a more laxative diet, with the result that an increase in yield is obtained but decrease in the butter fat due to probably: 1. That fresh foods affect more than artificial foods. 2. Increased intake of water in fresh luscious grass. 3. Increased intake of vitamins. 4. Increase in fresh air, sunlight and exercise. The drop in fat% is often used as an excuse in cases of adulteration.

(*d*) Feeding of oils and fats, such as Soya Bean, Linseed, Cocoanut, Cottonseed, Palm nut oil, sometimes causes temporary increases, but as a rule the addition of various kinds of oils to the diets of cows does not increase the butterfat %, although recent work (Nutrition Reviews 1944) by the Armican workers is not in agreement with this view. Some fast decrease the fat%. If Cod Liver Oil is fed in doses of 6 to 8 ounces daily, Golding (Proc. World Dairy Congress 1928) found that the fat % was depressed for as long as 6 weeks after the oil was stopped. Cod liver oil increases the vitamins A and D of the milk and should not be fed to Ceylon cows in quantities over 2 to 3 ounces daily.

(*e*) Certain foods are said to increase the yield such as rice conjee (made from country rice rich in Vitamin B), water pumpkin etc. In England, Wet Brewers Grains are as good as our local congee, probably due to an increased intake of water and the vitamin B complex of the wet grains. Gingelly cake is said to increase the yield due probably to the rich assimilable calcium ions present. Palm kernel, Cotton seed, Kapok seed cakes are claimed to increase the fat % but no absolute proofs are available.

13. **Water Supply**—If a herd of cows are being given insufficient water and then the deficiency is corrected, the milk yield invariably increases. See also drought conditions under section 10.

14. **Effects of Grooming**—Grooming increases the yield because the skin is kept cleaned and the metabolism is increased by the skin circulation of blood.

Flies and stinging insects, ticks, fleas and lice all tend to decrease the yield because of the irritation caused. Recent work of spraying cattle with D.D.T. (Vet. Mag. Dec. 1945) has resulted in increased yields and better skin health. To keep flies out of a byre, blue distempering of the walls and blue glass windows aid considerably.

15. **Handling of Animals**—Quiet handling of cows ensures good yield whereas rough handling causes a decrease in yield. The employment of inexpert milkers will cause a lowering of the fat content. There is also evidence that a change of expert milkers affects the composition. Some cows do not let down their milk to strangers. The Singhala Cow must have a calf to suckle prior to her letting down her little milk. Some owners change their milkers round for the cows to get used to as many people as possible. Some cows prefer girl milkers (C. V. A., Journal, 1943 p. 38) probably due to their scented fragrance, painted lips and scarletted nails. Decrease in yield has been noted when men milkers took over herds that had been milked by women.

In America Radio music has been used to increase milk. In Australia Mr. J. Shepherd in a New South Wales Farm installed a radio for his men to hear the test match broadcast results and found that his cows found the interval music soothing. Animals as a rule prefer soothing classics such as Waltzes to the tempestuous Jazz music and increases in yields are recorded. One wonders if the Jazz music affected the composition and even curdled the milk or churned it into butter.

16. **Effects of Spaying**—The operation of ovariectomy or Hysterectomy is not practised here nor in England, but in Australia and in America this is done to prolong the lactation period of old cows that will eventually be destroyed The lactation period is thereby prolonged, and the quality is up to standard.

17. **Effects of Abortion**—The quality of milk is up to the usual standards but the yield is not great, the lactation period soon falls off and the cows go dry. In the case of a cow with a contagious abortion that aborted at the 8th month the writer used a drug of recent origin by the mouth in doses of 30 mg. daily for fifty days and the cow was kept going in full milk up to the time of writing (6 months).

18. **Effects of Sexual Excitement**—During sexual excitement milk may show abnormal fluctations of quality and composition. The fat content is decidedly above average for 2 or 3 days immediately preceding the period of

active sexual excitement but the milk obtained in the first milking after the commencement of the awkward manifestations is generally very low in quantity and poor in fat, whilst at the next milking the quantity of milk and fat are very high usually.

Milk from a cow in oestrus causes diarrhoea in some children, so it is affirmed. But this is however definitely the case with foals and piglets. In the case of the foal when the mare comes on heat 7 to 10 days after foaling, it is customary to observe the foal with diarrhoea on those days. The same happens to piglets when the sow is in false heat, because the sow does not come into oestrus until after the piglets are weaned in 6 to 8 weeks.

19. **Effects of Milking Machines**—An efficient milking machine tends to increase rather than decrease the yeild of milk of an animal. The stripping must however be done by hand otherwise the milk will be of poor butter fat content due to absence of the high proportioned portion of milk (*See* also section 5).

20. **Abnormal Conditions**—Exceptional conditions, that is to say conditions, that vary very much from those to which a cow are accustomed as to alarm or excite them, may have a marked effect on the composition of milk in relation to fat (Bulletin 16, Ministry of Agriculture & Fisheries, London).

There is a wide scope for experimentation and the writer's experiments have been cursory and rather perfunctory within the limits of a private practitioner's purview. It is recommended that the Cattle Breeders' Association should try to awaken more enthusiasm for research work on these and other lines among our local animals where facts, figures and statistics of any sort are sadly lacking.

SWINE ERYSIPELAS

By

Capt. S. B. V. Rao,

E.V.O., Dev. Farms, H.Q., Southern Command.

Part II.

(Continued from Vol. XXII, No. 5, p. 341)

Pig Diseases.—An outbreak of swine erysipelas occurred at Deolali in October 1945, at the Army Development Farm, with a stock of 1815 pigs of all breeds, resulting in 279 deaths and 69 destructions of bad cases. This serious outbreak was brought about by bad hygienic conditions under which they were kept due to failure of water supply.

Symptoms.—Dullness, pyrexia, anorexia, and dyspnoea; cutaneous oedema made its appearance later in the form of plaques which became purple in colour and in some cases necrotic.

P. M. Lesions.—Lungs congested with pleuritic effusion ; Pericarditis with effusion; Lymph glands enlarged and congested; Necrosis of the skin particularly over the plaques.

Laboratory findings.—Local laboratory confirmed gram positive rods in-direct spleen smears submitted for examination as Erysipelothrix-rhusiopathiae suis.

Action taken—Infected buildings were evacuated and disinfected. In-contacts were placed in temporary kraals and serumised, and after 4 davs vaccinated against erysipelas. The whole herd was protected and the deaths declined to nil within the week following these measures.

Prophylaxis.—Breeding stock to be revaccinated every 9 months, and store pigs on reaching 3 months of age, in batches.

Points re Swine Erysipelas vaccine.

(1) Handle the vaccine with care as it is highly infectious to man.
(2) Use as expeditiously as possible and note the date of expiry.
(3) Store in a cool and dark place if all is not used immediately.
(4) After use sterilize the containers preferably by burning.
(5) The dose is 0·5 c.c given subcutaneously together with 5·0 c.c anti. serum. The serum and vaccine can either be mixed and given in one injection or injected separately, (for pigs under 50 lbs. in weight the dose should be reduced to 0·25 c.c)
(6) It is suggested that a few pigs are inoculated first to check the safety of the product, and then the remaining done.

The vaccine and serum were imported from U. S. A. and stored at Lahore Indian Military Veterinary Laboratory.

SWINE PARATYPHOID.

During April, 1945, 40 pigs of country, China, Malaya, and Middle white breeds died in the Army Development farm, South Deolali, in a stock of 806 pigs of all breeds. The mortality at first was among pregnant or recently farrowed sows. High mortality occurred subsequently among pigs 12–18 weeks old.

Symptoms.—An early rise of temperature to 107°F, dullness, anorexia, dyspnoea, the pig often breathing through the mouth, temperature became subnormal shortly before death which took place 48 hours after the onset.

Post-Mortem.—Circumscribed ulcerated areas about the size of a six pence were found over the wall of the pyloric portion of the stomach, while linear diphtheritic lesions running transversely round the lumen occurred scattered in the small intestines. (These lesions never resembled the raised button-like ulcers of swine fever). Lungs showed some consolidation and pneumonic areas. Spleen was normal. Mesentric lymph glands were haemorrhagic and enlarged.

Laboratory Tests.—The heart-blood rendered a gram negative, motile, non-lactose fermenting organism, which by sugar reaction was suspected to be member of the salmonella group. The organism was submitted to central laboratory for typing and was confirmed as S. *suipestifer.*

Control.—Defective management, poor hygiene, over-crowding, were considered primarily responsible for this outbreak, and special attention was paid to set them right, while following the usual routine measures for checking the spread.

An autogenous vaccine was prepared in the district laboratory at Bombay, containing 5 million organisms per c.c. Adults including sows in pigs received 1½ cc. of the vaccine without untoward sequalae. All in-contacts were dealt with first, and the rest of the herd subsequently. The disease abated with a loss of 27 weaners among the incontact.

Salmonellosis was also recorded in Military farms at Vakad, Marole, and Units at Poona. It may be concluded by observing that the disease is always associated with poor-management and defective sanitation.

(Udall in his book on Veterinary Medicine doubts the efficacy of vaccine to combat this disease).

FEEDING POULTRY

BY

CAPT. S. B. V. RAO,

E.V.O., Dev. Farms, H.Q., Southern Command.

The importance of feeding poultry on correct lines cannot be emphasised too strongly. The subject is briefly dealt with under the following headings. (a) Common feeding errors (b) The ideal to aim at (c) the routine of feeding from chick to laying bird and (d) the practical way of balanced feeding.

(*a*) Common feeding errors

(i) Lack of proper feeding routine, will tend to cause a falling off in egg production in the case of laying birds and retarded growth in young chicks, The birds should be fed in accordance with the prescribed feeding scales and the time table laid down.

(ii) Lack of adequate protein in the daily mash such as fish-meal or meat offals, without animal protein in some form egg yield will be seriously affected and development retarded. Hence the need to include animal is well as vegetable protein in the diet.

(lii) Absence of whole grains e.g. bajra and jawar will result in a badly balanced ration, and impaired digestive powers.

(iv) A deficiency of green food such as lucerne, lawn clippings etc will contribute to poor development and lowered resistance, to disease. Vitamins A & G so essential to health, growth and reproduction are found in these and other green foods.

(v) Lack of common salt will affect digestion and ultimately development. Salt is necessary as it supplies the mineral content required.

(vi) Absence of shell grit in the hoppers or boxes will tend to produce soft shelled eggs or cause a cessation of egg yield. Note: shell grit is not a substitute for stone grit which is also required by young chickens as well as adult birds as an aid to digestion.

(vii) Lack of an adequate supply of clean water interferes with digestion and egg laying. The water should always be kept in the shade.

(viii) Feeding outside the fowl house should not be encouraged on account of the risk of infection conveyed by crows and sparrows, contaminating the food. The precaution is not necessary, where runs are protected from these marauders.

(ix) Feeding birds by scattering the grain on the ground is the poorest way of feeding them, as they will tend to pick up infection from parasitic ova voided by carriers.

Properly constructed feeding troughs should be used, and kept scrupulously clean. The troughs should be made so that they can be easily cleaned, allow sufficient feeding space for each bird, and prevent the food from being scratched out.

Note:—It is important to remember that sunlight has a direct bearing on the assimilation of certain minerals like calcium and phosphorus, which are bone forming elements. It follows therefore that chicks from birth should, whenever possible, be exposed to morning and evening sunlight, in order to prevent stunted growth and other abnormalities.

(*b*) **The ideal to aim at** will be acheived very largely by avoiding the common feeding errors already mentioned. The most important points to remember are (i) Ensure that all the essential elements e.g. proteins, vitamins and minerals are included in the diet in the correct proportions. This will result in a properly balanced ration so essential for success. (ii) Practise a sound system of feeding from hatching to laying bird. (iii) Without efficient supervision, the desired results will not be obtained.

(*c*) Routine of Feeding from Chick to Laying Bird.

In order to get the best results, it is most important to adopt a proper routine of feeding.

(i) *Feeding of baby chicks and ducklings*:—

For the first 24 hours they should not be fed, but kept warm at 90 degrees F. and in darkness. During the next 12 hours water, milk or butter milk should be kept before them, besides clean sand or stone grit. From 36 hours to one week or even up to 14 days the chicks should be fed on a rich mash consisting of one boiled egg, one handful of wheat flour and one handful of bran, mixed together

thoroughly in suitable containers. This quantity will be sufficient for ten, week day old and for fifteen 2–5 days old chicks. Chickens should be fed several times a day say about every 4 hours, in small quantities. To harden the chick's digestive organs, small whole grains or crushed grains, which are white and attractive to them, such as millets should be given in addition to the mash twice daily.

White ants, butter milk, cholestrum and small fry fish are all good foods for promoting growth and should be freely used when obtainable.

(ii) Chickens from a fortnight old to 3 months when growth is rapid require twice as much grain per day. The quantity of mash consumed varies week by week. Actual requirements are shown in the diet sheets. (See under detail of Feeding).

(iii) Growing chickens from 3–6 months should be given twice as much grain as mash daily. The reason for this is that normal development can best be obtained by lowering the protein content of the food given at this stage of growth.

(iv) Laying birds: Feed the dry mash in preference to the wet mash Allow the mixture all the time every day during the year. The amount of grain to feed is governed by the amount of mash the hens eat, their physical condition, their production and the weather. The daily portion of grain varies from 10 to 15 lbs. per 100 hens, depending upon the above factors and the breed of chickens being fed.

The mixture or mash should contain all the essential elements correctly balanced.

Where suitable range is available poultry should be allowed to forage freely for their natural food. They should not however be permitted to scavenge on account of the risk of picking up infection by gaining access to drains and refuse heaps.

(*d*) Practical way of Balanced Feeding.

The main points to bear in mind when arranging a balanced diet is to ensure that it contains all the essential nutrients in the correct proportions.

The ingredients of the mixture should include protein both animal and vegetable. Examples of the former are meat offals and of the latter, groundnut cake etc.

Wheat or rice bran should also be utilized but these items should not form more than about 20 per cent of the mash, because they contain an excessive quantity of indigestible fibre. Two or more crushed grains e.g. Bajri or Jawar, which ever are the cheapest should always be included, because they are the energy producers. The dietary would not be complete however without the

addition of whole grains such as Bajri and Jawar, which are necessary to keep the digestive organs in efficient working order.

Mineral in the form of common salt in the proportion of $\frac{1}{2}$ to 1 per cent is a most necessary ingredient. An excessive quantity should not be given however.

Green food in the shape of lucerne, guinea grass etc is one of the chief source of vitamins A & G, so essential to a well balanced ration. The quantity of green food should be about 5 to 7 lbs for every 100 birds. It should be finely chopped and fed on top of the mash. Feed the dry mash to chickens in preference to the wet mash, as it is less likely to ferment and become sour and unpalatable. It should be noted that kitchen swill can also be fed to poultry up to 50 per cent of the standard mash. As the protein content in swill is very variable, it is essential to include meat offals or fish meal in the mixture. Only fresh swill should be fed and care should be taken to ensure that it is free from deleterious matter.

Note:—These instructions are in general equally applicable to the feeding of ducks, turkeys etc.

DETAIL OF FEEDING.

1. *Feeding of Baby Chicks and Ducklings from 1 to 3 weeks.*

The new hatched chicks are kept warm in darkness to rest them for the first 24 hours. During the next 12 hours milk or butter-milk and clean sand or stone grit should be placed before them in flat containers inside the brooder.

From 36 hours to a fortnight, they are fed on a "starting" mash consisting of one hard boiled hen's or duck's egg crumbled with a handful (2 ozs) of wheat flour and a handful (2 ozs) of wheat bran, mixed thoroughly and fed in suitable containers. 100 chicks will consume on an average when they are a week old 3 lbs. of the mash daily, and from 2-3 weeks 4 lbs. The mash should be fed in small quantities as much as they could eat up in twenty minutes, five or six times daily. In addition to this mash, feeding of small grains like millets and crushed larger grains like Jawar and Maize twice daily may be commenced after the chicks are a week old. Finely cut greens like lucerne or other green leafy vegetable must also form a part of the daily diet. Water should be kept in soil-proof containers all the time before them.

White ants, butter milk and cholestrum (or cow's first milk) and small fry fish chopped up, are all good feeds when available, for promoting growth of chicks.

Ducklings.—The method of feeding chickens is also applicable to Ducks in general. Feed crumbly *wet mash* five times a day after the ducklings are 36 hours old, in shallow dishes. At each feeding period, provide fresh drinking water, in fountains so arranged that the ducklings can submerge their bills in the water but cannot get into it to wet their bodies. This permits them to cleanse their nostrils by squirting water through them. Remove the feed after the ducklings have had their fill. Supply plenty of stone grit all the time.

2. *Feeding of Chickens 3 weeks to 3 months.* "*GROWING RATION*".

From 3 weeks to 3 months of age chickens are fed on general mash which is fed to layers along with the grains but the proportion of whole grains to mash is altered in order to increase the protein content of the total feed.

The general rule to follow is to feed twice as much mash as the grain ration daily. This could be easily calculated from the figures given below:—

100 chickens	3 to 4	weeks old consume	5	lbs. of feed.
,,	4 to 5	,,	6	,,
,,	5 to 6	,,	$7\frac{1}{2}$	,,
,,	6 to 7	,,	$10\frac{1}{2}$	,,
,,	9 to 12	,,	12 to 15	lbs.

For example 100 chickens 4 to 5 weeks old consume 6 lbs. feed, and hence must be fed 4 lbs. of mash and 2 lbs. of grains.

Green feed are fed at the rate of 1 to 2 lbs. per every 100 chickens finely minced in liberal quantities daily.

3. *Feeding from 3 months to 5 months of age.*

The grain ration is increased while the mash is decreased. The chicken are fed twice the quantity of grains as the mash calculated from the data below.

100 chickens 13 to 16 weeks of age consume 17 lbs.
,, 16 to 20 ,, 18 to 20 lbs.

For example 16 weeks old chickens get daily 12 lbs. of grains and 6 lbs. of mash.

4. *Feeding the layer: Laying ration.*

Animal protein is essential in any growing or laying mash. Therefore by-products of the Army slaughter houses, like meat offals and by-products of dairies, like butter-milk cholestrum, and skimmed milk are valuable sources particularly during war time as chicken feed.

Vegetable proteins could be obtained from cheap oil cakes also and brans.

Two alternative formulae are given below which work out to a satisfactory protein ration to be adopted as circumstances warrant.

MASH MIXTURE "A" OR "B".

"A".		"B" *Alternative mash.*	
Meat offals	40 parts	Fish meal or Dry fish powdered	15 parts
Ground-nut cake powdered	9 parts	Ground-nut cake powdered	14 ,,
Salt	1 part	Bajri (ground)	25 ,,
Jawari (ground)	20 parts	Jawri (ground)	25 ,,
Bajri (ground)	15 parts	Salt	1 ,,
Wheat bran	15 parts	Wheat bran	20 ,,
	100 parts or lbs.		100 ,,

Note:—When commencial fish meal is used, add only ½ lb of salt instead of 1 lb to 100 lbs of mash.

Meat-offals are cheap by-products of Army butcheries and contain about 13 to 14 per cent protein. Being watery the meat is not fit for human consumption but is a valuable source of protein for chickens if used in sufficient quantity. The offals are cooked with a little water for about 20 minutes and are then mixed chopped up with the rest of the standard mash in the proportion stated, in a crumbly manner and fed to the chickens.

In the alternative mash proposed, fish meal has been used as the source of animal protein, in case meat offals are not available.

Two ounces of the mash "A" or "B" is fed to each bird per day and in addition to this 2 *ozs of mixed whole grains* are fed per bird as per schedule given below. ½ *ounce of minced greens* per bird is also fed daily. Shell grit is made availabie to the laying birds only, in troughs in the pens to be picked up at will all the year round. *Stone grit* is supplied similarly where the yard is of clay-loam and the birds cannot easily pick up their grit requirements from the ground. Water is made available to them all the time in shady places and in covered containers.

SCHEDULE OF FEEDING

Hours 0700. Water troughs are cleaned and filled. One ounce of the whole grain mixture is fed as scratch grain where clean turf is available on wide ranges, otherwise the grains are best fed in clean troughs instead.

Hours 0900. 2 ounces of the mash per bird is fed in troughs to be kept before the chicken as dry mash till 1600 hours.

Hours 1600. Each bird gets ½ to 1 oz of greens like lucerne lettuce, cabbage etc. chopped up and fed in troughs on top of mash.

Hours 1800. 1 oz or 1¼ ozs of the grain mixture is fed in troughs, to White Leghorns or Rhode islands birds respectively.

The water fountains are filled at every feeding. The above totals up to 13 lbs of mash and 13 to 15 lbs of grains per 100 birds per day and 5 to 6 lbs of greens.

SWILL FEEDING

In the same way as by-products of butcheries are utilized as useful protein supplements to the chicken feed, the swill from the chicken houses is useful substitute for a part of the feed. The value of the swlll depends upon the amount of meat it contains. It has been found by examination of this kind cf feed that the amount of meat is small and is very variable in quantity owing to various factors, but the obvious value of the swill as an energy producing or fattening feed cannot be over estimated. Hence when swill containing non-meat ingredients are available in plenty, it could replace a major portion of the grain

ration as well as the mash, provided meat offals at the rate of at least 1 oz per bird is minced, boiled and added to the swill; while an ounce of whole mixed grain per bird may be fed to the birds daily in addition, in the morning before they get their swill.

Swill is best fed lightly mixed with wheat bran in a crumbly way. As a safe rule when birds are getting the swill in enough quantity an ounce of grain need only be fed, but the meat offals should not be reduced in the ration unless meat content of the swill is a regular feature, as there should be no great variation in feeding from day to day growing. The method of feeding of laying chickens is also applicable for ducks in general, but with the difference that the ducks are fed "wet mash", and swill is admirably adopted to fatten ducks and Turkeys for the table. If laying ducks become fat, they can be brought into laying condition by feeding them on the laying mash and coarse paddy in place of mixed grains and swill.

Ducks and Geese are good grass eaters and if this facility is not given them they suffer from digestive and nutritional ailments.

ADDENDUM

Adult ducks consume more feed than fowls. A dozen ducks of good size will require about 6 lbs. of feed daily. For economy therefore meat offals and food stuffs condemned for human consumption such as atta and biscuit should be fully exploited. A suggested econonical ration is 40% meat offals, 20 % biscuit meal, 15 % gram, and 25 % atta.

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Editorial

RECONSTRUCTION PLANS

NOW that the War has been ended and the fighting nations are returning to peace time activities, it is expected that the Post-war Plans formulated by the Bureaucracy when in power would take out practical shape now. We, therefore, desire to stress once again the need for a changed outlook in the policy of the Government with regard to Agriculture and Livestock. The famine that is threatening the country at the moment has been a great eye-opener to one and all alike and the past policy of the Government has come in for a good share of sharp legitimate criticism. The effects of the neglect of Agriculture and Livestock for the past some decades have come out very tragically in the starvation of the men and animals and in recurrent famines in the country. There is therefore a possibility that, in an anxiety to make up for the past, plans may be worked out with an eye only to the immediate present and without a correct appreciation of the coming future. Mechanisation of the land and production of artificial fertilisers are in the mouths of the administrators and officials and the way in which their advantages are being aired about as a sure panacea for all our past and present ills makes us wonder wheather they have learnt anything at all from the countries where such mechanised farming has been in practice for years past. It really looks as though they have been mesmerised by the apparent glamour of those countries.

The effects of the *rape of the soil* by wholesale mechanised farming, the disintegration of the intimate *man-animal-plant relationship* through the use of artificial measures and the consequent *ruin of the land*—all these are becoming more and more evident as years pass by. Criticisms, fortified by accurate scientific data, are mounting up against mechanised farming; while results are accumulating to demonstrate that nothing can supplant or excel the supremacy of the Farm yard manure as the Master Fertiliser of the soil. According to McCarrison, if the Vitamin B value of the cattle manure millet is taken as 1, that of chemical manure millet is approximately ·66 It has also been proved that the quality of the foodstuffs and fodder crops, especially in their vitamin content, is decidedly better when they are grown in lands enriched with Farm yard manure. This naturally brings us to the rationale of the worship of the cow in this land as the Mother of Prosperity. Mahatma Gandhi, the great economist that he is, is never tired of reminding us that the downfall of our couutry and ourselves started from the date we started neglecting the cow and that we can rise to prosperity only when we put back the cow in her proper place of ancient glory.

"It is a tragedy that the country which worships the cow pays scant attention to her and her progeny", says Mahatmaji. The cow is starved, the bullock is starved, the land is starved and, in the end, man also is starved. This chain of starvation should be ended by a bold Agricultural policy wherein the peasant should not feel his lands and livestock a burden to him. To quote from the Famine Commission Report (1945), "In India efficient cutivation depends largely on the capacity of the plough cattle, and cattle are also the source of Farm yard manure—the most important manure in the country. The value of cattle therefore in increasing the fertility of the soil and thereby the outturn of crops cannot be overestimated. Again, an increase in the consumption of milk is a most important means of improving the diet of the people and this depends upon the efficiency of the milch cattle. The prosperity of Indian agriculture is thus closely linked with the improvement of livestock". And, therefore, the Government must immediately settle down to some practical work in the development of Animal Husbandry. Rearing of

livestock on approved scientific lines must be taken up immediately. Adequate facilities must be provided for transport of cattle fodder from place to place and from surplus tracts. Grazing areas should be exploited and "silos" must be practically demonstrated in rural tracts. Demonstration plots and centres must stud the country-side where the ryots will have ocular proof of what practical Animal Husbandry and Mixed Farming connotes. Contagious diseases of a preventable nature must be a thing of the past and the ryot should be in a position to maintain his cattle and livestock healthy and well, free from the ravages of these epidemics. Paper propaganda and tall talking must cease—we have had enough of them. Difficulties should not get magnified—they are always there only to be tackled and overcome. Our problems must be solved in our own way and they should not be dependent upon the import of foreign experts. The latter are useful only up to a certain limit. Local talents must have opportunities to be drawn out. In these and similar ways, the Government must make amends, and that too rapidly, for the "criminal neglect" of the past and convert the seven lacs of deserted and ruined villages into centres of plenty and prosperity flowing with Milk and Honey.

PRICE OF CATTLE FODDER

We would once again stress the urgent need for Government to take immediate measures to control the price of essential items of Cattle Food such as Gingelly and Ground Nut Cake, Wheat Bran, Gram Husks and Paddy Straw. The prices of these articles today are scandalously high and unless the prices are controlled and brought down to a reasonable level, it is bound to have a disastrous repurcussion on the condition of Cattle in general and of milch cows and young stock in particular. No scheme of livestock improvement will be productive of any good in the future unless it is made possible for Livestock owners to feed the animals according to requirements for maintenance and production.

BOMBAY VETERINARY COLLEGE

Diamond Jubilee Celebrations.

We draw the attention of our readers to the proceedings of the Preliminary Meeting held for conducting the Diamond Jubilee Celebrations of the Bombay Veterinary College published in the last issue of this *journal*. We heartily endorse the appeal for funds and scientific papers to be read on the occasion and we are quite sure that the response to the appeal would be quite heartening. The Joint Secretary desires that every paper must be accompanied with an abstract and should reach him before the 15th October 1946 so as to facilitate the printing and circulation of the abstracts in advance. He also desires all the past Graduates of the Bombay Veterinary College to communicate their correct addresses and forward to him constructive suggestions for conducting the celebrations.

We understand that the occasion would be availed of for reviving activities of the All India Veterinary Association. That is very cheering news indeed and we are sure that the members of the profession in this country would rally to the call as of old and formulate plans and schemes for placing the profession on a firm and solid basis. National Governments are being formed in different Provinces after a long interval and it is up to us to strengthen their hands in the constructive programmes for the rejuvenation of the country.

Clinical Articles

A NOTE ON AN OUTBREAK OF BARU (Sorghum helipensis) POISONING.

By

H. K. Lall, B.Sc., M.R.C.V.S.

Government Cattle Farm, Hissar.

Introduction:—There is a common belief in the villages of the Punjab, specially in Hoshiarpur District, that *Baru* is harmful to animals when it is ripe and has brownish marks on its leaves. Venkatachalam (1943) gives the following description of *Baru*— "It is a tall perennial grass common all over India and is considered to be a good fodder grass. But it is held to have injurious effects if eaten too young or when the plants are stunted by drought. The poisonous character is said to be lost after it becomes mature and the spikes or flowers come out from the plants". He further states that deaths are due to hydrocyanic acid. Various species of Sorghum are known to contain hydrocyanic acid, specially in a wilted state. Sharma 1935 states that Sorghum vulgare poisoning is very common in India.

History:—Many deaths are suspected to *Baru* poisoning, but cases are seldom brought to hospitals because of the suddenness of the appearance of the symptoms resulting in death which renders it difficult to transport.

In the month of June, 1944, various animals were reported sick; six heifers suddenly died at the Thaska block of J. L. F. Hissar.— Plant poisoning was suspected and ruminal contents were sent to Chemical Examiner, but no report was received. There had been very little rain during the month of June. In July, however, all the outstations of the farm had showers of rain, but Kherwan had only a negligible amount. On 31-7-1944, information was received at 8 p.m. from Kherwan block that 10 animals had suddenly developed a serious illness and one cow had died.

Symptoms:—The symptoms started with staggering gait, convulsions with intervals, unconciousness, grinding of teeth, involuntary passing of urine and dung. These symptoms are exactly as described by Bagche and Ganguli 1936 in case of Hydrocyanic Acid poisoning. At 1 p.m. the animals recovered except one cow which was sitting. Its pulse was rapid and weak, and respiration was smooth but very slow. This surprisingly rapid recovery of other animals has been observed by Barcroft (1931) and Worden (1940) as quoted by Shearer & Seller (1944), who state that cyanide poisoning is due to interference with the oxidative enzymes of the tissues, in particular cytochrome and cyto-chrome oxidase, which owing to reversible inactivation of cyto-chrome oxidase, would account for rapid recovery.

Postmortem findings:—Cow No: 500-H-3-6 (tuberculin positive) Postmortem was performed the next day as the animal died late at night. There were subcutaneous haemorrhages, specially along the ventral side of the neck and in between the fore limbs; there was haemorrhagie fluid and froth in the mouth and trachea; larynx was discoloured; lungs were congested; haemorrhages in the pericardium and under the meningial covering and a clot in the frontal sinus were seen. *Baru* was found in the rumen. T.B. lesions were found in the mediastinal lymph glands.

II. Cow 42-H-1. 40 (pregnant eight months) had fallen ill on the night of the 31st, but did not die until the 6th. It had bright coloured blood all over the body. Haemorrhages were present under the skin (specially the anterior part of the body); blood was found clotted in the blood vessels of all sizes, even the capillaries, including the blood vessels of the foetus. The lungs were congested and there was some froth in the trachea. The colour of the blood was bright red as compared to the blood of another animal which had died about the same time. Papillae on the plica of the 3rd stomach were inflamed and it contained very dry mass of fodder which seemed to consist of *Baru* which can be easily recognised because of its rough texture. It seemed that the animal had not taken any water during the period of protracted illness. The blood vessels of the brain were congested and all the blood in them was clotted; haemorrhages were seen in the myocardium of the left ventricle.

Diagnosis.—It is not very common to come across such a protracted case of Hydrocyanic acid poisoning which it appears to be from the post-mortem lesions. The sodium picrate test was performed on the various grasses and Sokar jowar available in the area, where the animals were found grazing at the time of the illness. The ruminal contents were put to the same test and the soidum picrate paper turned brown thus showing the presence of hydrocyanic acid. According to Vander Walt (1944) this test is also positive in the cases of some other volatile snbstances as well.

The grasses tested were the following:—

1. Bur (*Andropogan lanniger*)
2. Palwa (*A. partusus*)
3. Panni (*A. muricatus*)
4. Sokar jowar (*A. Sorghum*)
5. Lamp (*Aristeda depressa*)
6. Bhurt (*Cenchrus.catharticus*)
7. Dub (*Cyondon dactylon*)
8. Motha (*Cyperus tria*)
9. Gathil (*Eleusine flagetllifera*)
10. Seon (*Elionurus hirsutus*)
11. Dab (*Eragrostis bifaria*)
12. Anjan (*Pennisetum cenchroides*)

13. Kuri (*Panicum helopes*)
14. Takria (,, *sanguinale*)
15. Ghamur (,, *antidotale*)
16. Chaprur (,, *petveric*)
17. Kheo (*Sporobolus orientalias*)
18. Samak (*Panicum colonum*)
19. Palinji (*Sporobolus pallidus*)
20. Baru (*Sorghum helipensis*)

The samples of *Baru* were taken from Kherwan, Sali and Thaska and all the three samples were positive to the above test. Wilted Baru was found with great difficulty at Sali and Thaska which had more rains than Kherwan. No hydrocyanic acid could be detected in samples of fresh *Baru.* Just about this time the rains came at Hissar and there was no possibility of getting any wilted grass.

It was the start of the grazing during the previous months, and it is therefore, natural that they must have consumed *Baru* which was abundant. As the soil has effect on the quantity of hydrocyanic acid present in the plant, it is possible that *Baru* in one 'block' might have contained more hydrocyanic acid than the *Baru* in others. Steyn (quoted by Vander Walt) could detect hydrocyanic acid in maize only when grown on red sandy soil and not when grown on black clay soil. Busso (*ibid*) states that heavy fertilizing with nitrates favour a high hydrocyanic acid content.

Hydrocyanic acid was also detected in sample of Dub grass (Cynodon dactylon) obtained from the field where the animals were grazing. Sodium picrate papers became brown (less than in case of *Baru*) after a short interval of setting up the test. Steyn (1934) has also found hydrocyanic acid in fresh specimens of various cynodon species. The Dub grass has never been heard of having any injurious effects on the animals in any stage of growth. On the other hand 'is one of the most satisfactory and highly nutritious fodder grasses'. (Lander 1937). Dub is very rich in calcium and it is possible that it may be responsible for changing the 'Ph' of the ruminal contents making it more alkaline and thus reducing the speed of absorption of Hydrocyanic acid. Not enough samples of this grass were examined for Hydrocyanic acid, so it cannot be said with surety whether there is enough Hydrocyanic acid in it to cause damage. A small quantity may be found in any plant, as it is presumed to be formed in protein synthesis of the plant. (Sample was sent to Imperial Veterinary Research Institute, Izatnagar, for confirmation, but the grass was received there in dry condition, so no further tests were carried out there).

FEEDING EXPERIMENT

An effort was made made to get wilted *Baru* to feed the animals, but only a small quantity was available. One to two lbs. wilted *Baru* was fed

to a guinea-pig with no ill effects. Ripe and semi-ripe *Baru* was fed to 4 calves for a period of two months with similar results. Thus it seems to be an erroneous impression that the ripe *Baru* may cause death. It is only the wilted one which has injurious effects because of its Hydrocyanic content, varying of course with the type of soil and climate.

SUMMARY

1. An outbreak of *Baru* poisoning with full postmortem report is described.
2. There was rapid recovery in 9 animals which showed symptoms of Hydrocyanic acid poisoning.
3. Hydrocyanic acid was detected in all samples of wilted *Baru* and Dub grass by sodium picrate test.

ACKNOWLEDGMENT

The author wishes to thank Mr. D. Saran, L.V.P., Veterinary Assistant Surgeon for his technical assistance.

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SUCCESSFUL GASTROTOMY IN A BITCH

By

F. C. Bhuyan, G.B.V.C,

Veterinary Assistant Surgeon, Kampur, Assam.

Subject:—A "Labrador" bitch, age about 1½ years.

History and symptoms.—The animal was sent to this hospital through a servant at noon on the 15th October 1941, with the following symptoms.—Frothy ropy saliva from the mouth, breathing laboured, blood-shot eyes restlessness, inclination to bite objects, weakness of hind quarters—a real picture of Rabies. The temperature was 104°F. Further observation showed that the dog was straining at intervals and that it had no difficulty in taking in either liquids or solids. As the attendant was not able to give any history, nothing was done till the evening when the owner turned with a strange history. The dog was in the habit of bolting its feed. To prevent it, pieces of stones were used to be mixed with the food. On the 13th October 1941, the dog, however, swallowed one of these stones along with the food. A dose of castor oil was immediately given by the owner but it had no effect. Since then, the dog has been ill.

Emetics, enemas and liquid Paraffin in 2 oz doses were tried for three days but without any success. On the fourth day, the temperature rose up to 106°F. and all the symptoms including the staring became aggravated.

An X-ray examination was made on the 21st October 1941 and this showed the presence of the stone in the stomach. An operation was decided on and was carried out on the 1st November 1941.

Operation.—The dog was anaesthetised with A.C.E. Mixture. An incision was made, with aseptic precautions, in front of the umbilicus and was extended forward, carefully guided by the left fore finger, up to the sternum and the abdomen opened. The stomach with the foreign body was brought out after gentle manipulation and its sides were firmly packed with sterile towels. The foreign body was then removed by incising the stomach directly over the stone. The wound was cleaned with 1:1000 solution of Hg. cl_2 lotion the lips were inverted and closed with double lembert sutures. The organ was then carefully retained into the abdomen. The incision in the abdominal wall was closed in the usual way. The bitch was on the operation table for nearly two hours and regained consciousness about 45 minutes after the operation.

After-treatment.—Anti-tetanus serum (1500 American Units) was given immediately after the operation subcutaneously.

Soluseptasin (M & B) (5 c. c. of 10% solution) was injected daily.

The wound was dressed with Spirits Rectified every day.

The diet consisted of chicken soup and glucose D.

The dog was progressing satisfactorilly till the 7th November 1941, when, unfortunately, on seeing the owner for the first time since the operation, it jumped about and got itself excited. Next morning, i,e., the 8th November, all the stiches had given way and the intestines were found prolapsed and lying in the bandage much to my disappointment. The dog was put on the table at once, the parts cleaned and the bowels were returned into the abdomen. The stitches were put on again and the part well covered with bandages. Soluseptasin was continued till 23rd November. This time, the healing was uninterrupted and the case was discharged cured on the 26th November 1941.

I would be failing in my duty if I do not mention the name of my esteemed colleagues Mr. P. C. Dutta, V.A.S., Silchar and Maulvi D. F. Ahmed. S.V.A.S., Silchar, for their ungrudging services rendered in such an operation which I think is the first of its kind in Assam up to this time. I also offer my sincere gratitude to Mr. A. R. Chaudhury, Veterinary Inspector, for his valuable sound advice. I also tender my hearty thanks to the owner and Dr. S. C. Kundu, A.S., Silchar, who offered me all sorts of facility in undertaking the operation.

HERNIOTOMY IN A DOG

By

F. C. Bhuyan, G.B.V.C.,

Sty. Veterinary Assistant Surgeon, Silchar, Assam.

Subject.—"A Labrador" dog, 6 years old.

History.—The animal had a fall on a piece of wood a fortnight back and, as a result of it, developed a reduceable abdominal hernia. Pressure bandage for a fortnight failed to effect a cure and therefore with the permission of the owner, it was decided to operate.

Operation.—With the usual precautions and preliminary preparations, the animal was put on the table on the 14th October 1940 and anesthetised with A.C.E. mixture. It was then placed on its back and all the legs held apart and secured. An incision about 4" long was made along the length of the hernia. After the necessary dissection, the edges of the hernia were freshened by scarification. The peritoneum, the muscles and the skin were then separately sutured and the wound protected by a many tailed bandages round the abdomen.

The dog came round from the anæsthetia in abont 40 minutes.

After-treatment.—Tetanus Anti-toxin was given in the evening subcutaneously. Prontosil Album Tablet (7½ gr.) was prescribed orally till the 21st October. The diet was only of a liquid nature and it consisted of liver and chicken soup in small quantities often. The wound was dressed with Rectified Spirit.

Result.—The wound healed well and all the stitches except two were removed on the 21st October 1941. With simple treatment, the two other stitch wounds also healed and the dog was discharged cured on the 30th October 1940.

I am thankful to my colleague Mr. P. C. Dutta, Veterinary Assistant Surgeon, Silchar, who rendered all possible help to me during time of operation.

CAESAREAN SECTION IN A BITCH

By

F. C. Bhuyan, G.B.V.C.,

I/c Veterinary Hospital, Silchar, Assam.

Subject.—A "Labrador" bitch, 8 years of age.

History and symptoms.—Bitch used to give birth to 6 to 8 pups every year regularly without any trouble. She came to hospital on the 29th January 1940 with a temperature of 104° F. She was off-feed and had a slight foetid discharge from the vagina with occasional colicy pain. Examination revealed that she was due to whelp but no 'quickening' could be detected.

The vagina was douched out with warm Pot. Permanganate lotion, an enema was given, and a dose of Chloral hydras was prescribed. An intravenous injection of Iodine (1½ grs. of Iodine in 5 c.c of distilled water) was also given and the case was kept under observation.

On the 31st January 1940, the dog was listless and the vaginal discharge had increased. The temperature was 104° F and there was only an occasional straining. Vaginal examination showed the presence of a dead fœtus. With gentle, careful manipulation, it was removed. Further examination revealed the presence of another dead pup far inside and beyond the reach of the fingers. As the animal was getting exhausted, it was decided to do caesarean section and remove the pup. As the permission of the owner could be obtained only very late the operation was carried out on the 1st February 1940. In the meanwhile, a dose of Camphor Oil was given subcutaneously.

Operation.—After the usual preparations, the bitch was anaesthetised with A.C.E. mixture. It took nearly 45 minutes to get under. When once the anaesthetia was complete, the bitch was put on her back with all the limbs well secured wide apart. An incision was made along the linea alba from the umbilicus to near the pelvic brim—about 6" long. The gravid uterus was brought out of the abdomen and firmly secured on a clean sterile towel. The sides of the abdominal wound were firmly pressed against the uterus with sterile towels to prevent prolapse of the bowels and also to prevent the soiling of the abdomen by the uterine contents. Then the uterus was opened by a clean, bold incision and a decomposed, full grown, male fœtus was extracted with all its membranes. Uterine cavity was then irrigated with a 1-2000 $HgCl_2$ lotion and cleaned. The incision in the uterus was then closed with catgut sutures and the organ returned to the abdomen. The wound in the abdomen was then sutured in the usual way and the operation completed with a protective many tailed bandage round the abdomen. After the operation, a dose of Camphor in oil was given and the dog regained consciousness in about an hour.

After-Treatment.—A dose of Anti-tetanus (1500 international units) serum was given subcutaneously after the operation. Prontosil Album 7½ grs. tablet was prescribed daily from the 2nd to 6th February 1940. The wound was cleaned daily with Spts. Rectificatus. The diet was of course, liquid with Glucose D in it.

Post-operative temperature ranged from 103° F. in the morning to 105° F. in the evening. The patient's appetite remained good and the animal took the nourishment given easily. On the 6th February 1940 the temperature shot up to 106·4° F. and the pulse became weak and feeble. Two doses of Camphor in oil were given and also a dose of Rephrine (Bayer) every 2 hours subcutaneously. Suspecting trouble in the right horn of the uterus, which even at the time of caesarean section was of a black red colour, a second laparotomy was decided.

On the 7th February 1940, the dog was again anaesthetised with A. C. E. mixture and the abdomen opened at the seat of the first operation. As anticipated, the right horn was found gangrenous—decomposed and dark-liver coloured at its centre. With ligatures on either side, it was removed carefully and the abdominal wound closed in the usual way.

From the 8th to 24th February 1940, the wound was dressed with Hydrogen Peroxide and Eucalyptus dressing after a preliminary cleaning with Spts. Rectificatus. Prontosil tablets were continued up to 22nd February 1940.

Remarks:—It would have been better if the diseased right horn of the uterus had been removed in the first instance itself; but it was thought that nature would come to the rescue and save the part. It was however not to

be and, as the saying goes, all is well that ends well. The second operation proved successful.

Conclusion.—My thanks are due to the owner for giving every facility for the operation and to Mr. M. K. Das Purkyastha, Veterinary Assistant Surgeon, Silchar, for his kind help in conducting the operation and I am also grateful to our then Veterinary Inspector, Surma Valley circle, Mr. H. C. Sen, for his wise counsel in conducting the case.

PROTEIN THERAPY IN VETERINARY PRACTICE

BY

G. N. ROY CHAUDHURI,

Late Professor of Surgery, Bihar Veterinary College, Patna, Calcutta.

Many diseases which do not respond to the usual treatment by internal drugging and external medication, often show an immediate improvement when put under Protein Therapy.

In veterinary practice, the field for its use is extensive and the response in animal tissues is sometimes wonderful. The body resistance rises and, given in gradual doses, a cure is effected in most cases. Milk-protein mobilizes and increases the defensive forces of the body in acute infectious diseases, particularly in the early stages.

The protein therapy has been found very useful in canine practice in cases of eczema chronic ulcers, endometritis, salpingitis, distemper and keratitis. In cows, peurperal septicaemia following retention of placenta has also yielded successfully to this treatment.

"Siolan" and "Siolan cum Iodine" (Albert David) have been found very satisfactory, the latter in fever, endometritis, etc., because the additional iodine helps to bring about a speedy resolution of such conditions.

The following case reports appear to justify the claim that this therapy constitutes a distinct advance in modern veterinary treatment :—

CASE REPORTS

1. "Alsation" (black and tan), suffering from Anaemia. Temperature 105°F; blood and stool examination negative; previously Sulphadiazine had been given; 'Siolan' 2 c.c. was injected intramuscularly; temperature came down to normal on the second day. Liver extract injections to improve the anaemic condition soon effected a cure.

2. "Golden Cocker" with stomatitis and gastritis. General condition very low, vomiting food now and then. 'Siolan' 2 c.c. was injected every 4th day, three injections in all, together with vitamins A.B.C.D.G. (Esdavite Pearls, Sharp & Dohme). Dog made a wonderful recovery.

3. "Boxer Pup" suffering from Pyrexia of unknown cause. Injected 'Siolan' 1 c.c. and treated with alkali mixture. The second injection was increased to 1½ c.c.; the fever abated and the pup made an uneventful recovery.

4. "Pekingese" suffering from dry eczema with pruritis. Injected 'Siolan' 2 c.c.; after the same interval 5 c.c. The eczema dried up and the scratching ceased.

5. "Great Dane" with chronic moist eczema. 2 c.c. of Collosol Manganese (Albert David) was injected every fourth day and 'Sionamide' ointment (a combination of Sulphonamide and Vitamin A, Codliver oil) was applied on the affected parts. The dog was cured within three weeks.

6. "Great Dane dog".—Age 3 years, was suffering from Blepharitis, near eye. The whole orbit was involved, the skin round the eye was inflammed and due to constant rubbing, the parts were swollen and tender. For sometime, the dog was treated by external applications and ointments with no benefit. The dog was brought under my treatment in the month of January last. The following treatment was adopted.—

(i) Fomentation of the eye twice daily with warm water, containing 2% Sodi Bicarb.

(ii) After drying the eye, 1% sulphanilamide ointment over the affected area.

(iii) Siolan 2 c.c. intramuscularly in the gluteal; later on, the dose was gradually increased by 1 c.c. every fourth day. The dog made a complete recovery in a fortnight's time although it had been suffering for over 3 months from the complaint.

7. "Blue Roan Cocker". Age 5 years, suffering from Chronic dry eczema. Treatment adopted.—The hair was clipped, a warm water bath was given and the animal perfectly dried. An application containing Pulv. Sulphur Sublimate 1 dram; Oleum Picis–2 drams and Oleum Sinapis 8 ounces was applied on the body, once daily. The dog was given a bath every fourth day.

'Siolan was injected at 2 c.c. dose on the first day; 2½ c.c. on the fourth day; 3 c.c. on the 8th day and 3½ c.c. on the 12th day. The dog made a complete recovery.

M & B 693 IN THE TREATMENT OF HAEMORRHAGIC SEPTICAEMIA IN CATTLE.

By

R. L. Gulati, L.V.P.

Veterinary Assistant Surgeon, Amritsar, Punjab.

Haemorrhagic Septicaemia is an acute contagious disease with a very short duration of 12 to 48 hours. Mortality is almost cent per cent. Various methods of treatment have so far been tried but the results in all these cases have been far from satisfactory. The treatment suggested so far may be summed up as under:—

1. Intravenous injection of H. S. Serum and Lugol's Solution of Iodine.
2. Large doses of Camphor per mouth (Dr. Kerr)
3. Firing of the swellings at the region of the neck.
4. Tracheotomy along with either of the above treatments.

I have tried treatments Nos. 1, 2 and 4 in different cases but the results have not been satisfactory.

Taking a clue from the instructions enclosed with M & B 693 tablets that the tablets are useful in human plague (pasteurelosis) I tried these tablets in 5 cases of Haemorrhagic Septicaemia and it is a matter of great pleasure to find that all of them recovered. The blood of these cases was examined in the Laboratory and was positive for Haemorrhagic Septicaemia in three cases.

If the cases are just in the initial stage with high rise of temperature, extreme dullness, and running from the mouth and nostrils without much of respiratory distress, then 10 to 25 tablets of M & B 693 with an ounce of Soda Bicarb are given carefully in the form of a drench. These doses afe repeated after every three hours until the animal is cured.

Usually it is very uncommon to get a case in the early stages. Out of the five cases treated only one was in the initial stage and the rest were advanced cases with respiratory distress and protruded tongue. The procedure followed in these cases was to give the tablets intravenously. About 8 to 15 tablets (according to the size and age of the animal) are thoroughly powdered with half a drachm of Soda Bicarb. 100 to 150 c.c. of distilled water are added to the powder when the whole thing becomes a white solution as the tablets are not soluble in water. This is injected carefully into the jugular vein shaking the mixture every time because the powdered tablets tend to settle at the bottom. The injection of the solution is preceded and followed by normal salt solution as is usually done in all

intravenous injections in large animals. Great care should be taken that the animal does not struggle much when being secured for the injection as the slightest exertion will considerably augment the respiratory distress. It is always preferable to inject the animal in the standing position than to cast it down. If the condition of the animal improves after three hours and a drench can be safely given then a dose of about 12 to 25 tablets is given *per os* every three hours till the animal recovers. If the condition remains the same after the first injection another injection should be given with the same dose after three hours.

It may appear strange that a thick solution of the tablets was injected directly into the blood; but, as the first case of Haemorrhagic Septicaemia which was brought for treatment was an advanced case and as it was sure to die if no aid was given, the intravenous injection was tried as a matter of necessity. To my great relief, the case made a wonderful recovery. After that I have injected these tablets intravenously in all big animals without any untoward effects.

I hope this treatment will be given an extensive trial and the results communicated through this *journal*.

CHOKING IN A KID.

By

M. H. Rahman,

Veterinary Officer, Mymensingh, Bengal.

An young kid, about one-and-a half months old, was brought to the hospital on February 6, 1945 ***in extremis*** and it died within fifteen minutes after arrival. The history of the case was that since the previous day it was not suckling milk from its mother.

On post-mortem, a plum seed weighing 11½ grains was found firmly imbedded near the Pyloric end of the oesophagus and blocking its lumen. There were no other abnormality in the carcase and it is rather strange that such a small obstruction should have been the cause of the death of the kid.

Our Mail Bag

An Interesting Case of Post-mortem on a Giraffe.—By G. R. Viswanathan, G.M.V.C., P.G. (Edin. & Mukt.), Veterinary Investigation Officer, Madras. An interesting post-mortem was held at the Madras Zoo on a male Giraffe, aged about 4 months on 5-2-1925 at the request of D. A. Aitchison, M.R.C.V.S., the then Principal of the Madras Veterinary College.

The animal died the previous night and the history of the case was as follows:—The Giraffe was brought from Mysore and when changing train at Bangalore gave trouble, and in breaking out of his box fell in the closed truck. He was brought to the zoo in a recumbent position passed dung, but no urine and was eating even on 4-2-25.

The condition of the animal was good and there was no serious abnormalities on external examination, except swellings on the back and knee. On opening the carcase, practically all the abdominal organs were found normal. "The abdominal cavity contained about 4 gallons of slightly blood tinged and smelling urine". The pleural cavity contained 3 pints of straw coloured fluid while the pericardial sac had 2 ounces of similar fluid. The bladder was found ruptured near the pelvic brim and contained calcarious deposits. On microscopical examination, the liver was found cirrhotic, the kidneys showed intestinal nephritis and the spleen splenitis.

(Note.—Condensed from the detailed post-mortem report sent by the author, Ed. *I.V.J.*).

Mr. C. V. Narasimham, G.M.V.C., Veterinary Assistant Surgeon, Parvatipur, gives a resume of 16 cases of Chronic Bronchitis in cattle that were treated with intravenous injections of Calcium Gluconate. 20 to 30 c.c. of a 10% solution was given once in three days. The period of treatment varied from 6 to 14 days and in very advanced cases it was prolonged to one month. 15 cases got completely cured and one discontinued. The author concludes that this method of treatment with Calcii Gluconate is considerably cheap and efficacious and shortens the course of treatment.

Filaria Oculi in both the eyes of a cow.—By B. R. Phanse, G.B,V.C., Veterinary Surgeon, Dharampur State. The subject of this case was a cow which was admitted as an out-patient in the veterinary dispensary for treatment of a fly-blown wound at the base of the right ear. While cleaning the wound attention was directed to the wriggling of tiny thread like worms in the right eye underneath the membrana nicititans. After

completing the dressing of the wound in the ear, the eye was irrigated with Boric lotion, the eyelids kept apart with a retractor and five filarial worms were removed. On further examination, the left eye also was found affected with these extra ocular worms (Thelizia Rhodesia). These also were removed in subsequent days—in all 12 filaria from the right eye and 14 from the left eye.

The interesting feature in this case is that there was no complications in the eyes due to these worms and they were for practical purposes normal.

Opsodin in Canine Practice.—By K. S. Shetty, G.M.V.C., Narayanaguda, Hyderabad Dn. Opsodin, a natural lactalbumin free from bacterial toxins for the production of non-specific immunity, is prepared by Cipla Laboratories, Bombay. I have used this preparation extensively with very favourable results in the initial stages of Canine Distemper. I have also used this successfully in broncho and lobar pneumonia in conjunction with M & B. 693 or Cibazol tabloid.

Observations on Ocular Filariasis.—By R. N. Srivastava, Veterinary Assistant Surgeon, Hata, Gorakhpur Dt., U. P. Refering to the article on 'Ocular Filariasis' by Mr. K. Surya Rao, G.M.V.C., Veterinary Assistant Surgeon, Draksharam, Madras, published in the *Indian Veterinary Journal* Vol. XX, No. 2 of page 196, I am writing below a few lines of my experiences in this connection and would deem myself fortunate if the same is proved of any help to the profession.

During my stay of 2 years and 9 months in this district I have come across about 15 cases of Extra Ocular Filariasis in cattle. Out of these 13 were bullocks between the age of 7 to 13 years. One was a cow 5 years of age and the remaining one was a heifer about one and a half year of age. The parasite-Thelazia-rhodesii-was always found in clusters hidden behind the membrana nicititans. Sometimes these were found in one eye and sometimes in both the eyes.

I have noticed that a majority of these cases were debilitated and ill-nourished. One of my most interesting experiences in treating these cases was the finding of a sudden lameness in the fore-leg of the same side of the eye harbouring the filaria.

(The lameness is typical of temporary Radial paralysis caused by stretching of the leg in the act of securing the animal.

If the lameness and the finding of the ocular filariasis had any connection, then, the lameness would have been noticed even before the animal was cast and secured).

The Incidence, type and Bacteriology of Salmonella Infection in the Army in India.—By Major William Hayes, M.Sc. (Dub.) F.R.C.P.I., D.P.H., I.A.M.C., and Captain Joseph F. Freeman, D.T.M. (Cal.), I.A.M.C.

1. A survey of Salmonella types responsible for disease in the Army in India from 1941 to the beginning of 1945 has been made.

2. Attention has been drawn to the marked increase in the number of Bact. paratyphosum C and Bact. enteritidis infections reported in recent years.

3. By far the greater proportion of Bact. enteritidis strains have been isolated by blood culture or from anatomical sources which imply for the organism an evasive role in man.

4. Possible reasons for the apparent increase in Bact. paratyphosum C and Bact. enteritidis infection are discussed.

5. The clinical types of invasive Bact. enteritidis disease are described.

6. An account is given of interesting or instructive findings in connection with the bacteriology of the Salmonella group.

Ind. Jour. Med. Res. Vol. 33, No. 2, October, 1945.

Studies in Calcium and Phosphorus Metabolism. The Tonic Products of Calcium Phosphates in Experimentally Induced Vitamin D Deficiency.—By V. N. Patwardhan, R. G. Chitre and D. R. Sukhatankar.

Vitamin D deficiency has been induced in dogs on two types of diets, one a diet deficient only in respect of Vitamin D and the second a diet deficient not only in vitamin D but in which the phosphorus content was very low. The serum calcium, serum inorganic and acid-soluble phosphates, serum protein, and plasma pH (in the 3rd batch of experiments) were determined at fortnightly intervals throughout an experimental period lasting 16 to 31 weeks. The findings on these two diets are summarized separately.

1. *On diet No. 1.*—Serum diet decreased as Vitamin D deficiency increased; serum inorganic phosphorus as compared with the controls was only slightly reduced. On administration of vitamin D, the serum calcium rose earlier than the inorganic phosphorus. No significant change in the total acid-soluble phosphorus of the serum was observed. The protein content of serum slowly increased with the age in both the control and the rachitic groups; vitamin D administration had no influence on the total serum protein of the rachitic dogs. The value for pK s.p. for $CaHPO_4$ and $Ca_3(PO_4)_2$ increased as the deficiency of vitamin D progressed, and decreased after the administration of vitamin D.

2. *On low phosphorus diet.*—The young puppies used for this experiment showed a mild degree of rickets even at the beginning of the experiment. They were started on the same diet as in (1) but were later changed over to a low phosphorus diet. After this change hyper-calcaemia set in in both the control and the rachitic groups. It set in earlier, however, in the control dogs, declining somewhat later on. The serum inorganic phosphorus was lower in the rachitic group and rose slowly after administration of vitamin D. The concentration of serum protein was unaffected by (a) the change in diet, (b) the onset of severe rickets, or (c) the administration of vitamin D. The plasma pH in both groups also remained unchanged throughout the experiment. At the beginning of the experiment the values for pK s.p. $CaHPO_4$ indicated undersaturation in all the four dogs. In control dogs receiving 500 I.U. vitamin D per day per dog they approached the saturation point whereas those of rachitic dogs moved slowly towards saturation even after the administration of 4,000 I. U. vitamin D per day per dog.

The observations made in clinical rickets that the ionic products of calcium phosphates are influenced by state of vitamin D nutrition has been confirmed.

Ind. Jour. Med. Res. 33, 2, October, 1945.

Vitamin A Content of the Liver Oils of Common Fresh-Water Fishes of the Punjab.—By Bashir Ahmad, Ram Chand and Mansoor-Ul Hassan. The liver oils of some common species of fish found in the streams and rivers of the Punjab have been examined for their vitamin A content both by the colorimetric and spectrographic method of assay. They have been found to be rich sources of vitamin A. Values as high as 20,000 I. U. and 26,000 I. U. per g. have been recorded. The livers which are now allowed to go waste could yield appreciable quantities of medicinal fish liver oils.

Ind. Jour. Med. Res. 33, 2, October 1945.

Pharmacological Action of Alkaloids of R. Serpentina Benth. Neo-Ajmaline and Iso-Ajmaline.—By B. B. Bhatia, M.D., M.R.C.P., and R. D. Kapur, M.D. The pharmacological action of two new alkaloids of R. Serpentina (isolated from plants grown in the Dun valley, U.P.) provisionally named as 'neo-ajmaline and iso-ajmaline' has been reported in this paper.

1. Both the alkaloids are found to have a slight stimulant action on the nervous system, followed by well-marked depression.

2. Both the alkaloids are found to have a depressant action on plain muscles of the heart, blood vessels and intestines.

3. Both of them lower the blood pressure in the intact, spinal and decerebrate aaimals in normal condition and also after experimental hyper. tension.

4. Neo-ajmaline has a powerful stimulant action and iso-ajmaline has a mild depressant effect on the uterus of rabbit and guinea-pig.

5. The average toxic dose of neo-ajmaline in frogs is 0·1 mg./g. body. weight, and for guinea-pigs is 0.065 mg./g. body-weight. Iso-ajmaline is slightly more toxic. In every case death was due to respiratory failure.

Ind. Jour. Med. Res. 32, 2, October 1944.

Association News

THE PROCEEDINGS OF THE 11th ANNUAL GENERAL MEETING OF THE PUNJAB SUBORDINATE VETFRINARY SERVICE ASSOCIATION

HELD ON THE 26th DECEMBER, 1945

The 11th annual general meeting of the Punjab Subordinate Veterinary Service Association was held on the 26th December, 1945, at 10 A.M. in the highly decorated District Board Hall at Lyallpur. Dr. Ram Lal Ghulati was in the Chair.

The following programme was gone through in that meeting.—

1. Minutes of the last meeting were read by the Secretary which were approved by the house.

2. The annual report on the working of the association for the year 1945 was also read by the Secretary. He informed the house about the orders received from the authorities in reply to the resolution Nos. 2, 3, 4 and 8 of 1944 which has already been communicated to the members in the booklet on the activities of the association. The efforts by the President and the Secretary regarding the grant of B.V.Sc., Degree to the L.V.P's was also made known to the house. Then the result of the Scheme of the Divisional Secretaries was placed before the house. The highly commendable work of the Multan branch was very much appreciated by the house with cheers. The resolutions passed by the managing committee during the year together with their replies were also read, which have already been communicated to the members in the booklet mentioned above. The resolution No. 5 passed by the managing committee together with its reply which could not be included in that booklet is given below:—

"This meeting of the Executive Committee of the Punjab Subordinate Veterinary Services Association regret to point out to the Director, Veterinary Service, Punjab, Lahore, that sometimes circulars regarding training etc. are either not sent at all to the subordinate veterinary staff or reach them very late in one sub division, while in others the circulars reach in time. It is requested that in future all such like circulars be circulated to all the subordinate staff in all sub divisions in time please". The Director Veterinary Services very kindly forwarded a copy of the above resolution to all circle Superintendents, for information and guidance.

The Secretary then put before the house the strength of the association regarding its membership and finances. The total number of the members at the end of the year was 234 as against 132 at the end of the last year. The members were requested to please clear off their dues.

The statement of Income and Expenditure for the year 1945 which was read in the house is given below:—

Income	Amount			Expenditure	Amount		
	Rs.	A.	P.		Rs.	A.	P.
Balance from last year	175	7	1	Postage	50	0	6
Admission fee	114	0	0	Stationary and Printing	135	9	9
Annual subscriptions	344	0	0	T. A. and transit	49	14	6
Savings Bank interest	1	8	0	Kept by the President for postage	54	8	0
Refund by the Divisional Secretary Multan.	4	12	0	Deduction by the Divisional Secretaries.	20	1	0
Total	639	11	1	Total	310	1	9

Balance on 31-12-45:—Rs. 329-9-4.

3. *Professional Papers:—*

(i) "Use of Potassium Permanganate prophylactically in Ranikhet disease. "This article was received from Dr. Rajindar Singh, L.V.P. As the writer was not present in the meeting Dr. Raghu Nath Rai read this article which was based on the personal experience of the writer.

(ii) The article or "The Importance of veterinarian in India" by S. Kernail Singh, L.V.P. which was to be read by the Secretary at the writer's request, could not be read as the house was not in favour of its being read the second time, as it was already read by the writer himself in the 9th annual general meeting.

(iii) Then Dr. Ram Lal Ghulati in his extempore speech told the house about his experience regarding the use of M.B. 693 in the treatment of Metritis, Retention of Placenta, Rinderpest, and Haemorrhagic Septicaemia and claimed quite satisfactory results.

4. Then the following resolutions were unanimously passed in the meeting:—

Resolution No. 1.—In view of the fact that the Punjab Government has now taken up the most important and belated question of the revision of the grades of the Subordinate Services in the Province and that the proposals in connection with the revised scales of pay for the Subordinate Services are being sent to the Heads of the Departments for recommendations before they are placed before the Punjab cabinet for approval (vide A.P.I. news published in the Tribune dated 20-12-1945). This association request the Director Veterinary Services, Punjab, to kindly recommend the grade of 150-10-250-15-400 for the Veterinary Assistant Surgeons and the Veterinary Assistants.

In submitting this resolution the association further points out that the grades of Subordinate Services in other Departments e.g. Police, Reclamation, Medical and Others, have been, it is understood, considerably improved over the old grades existing before 1936 and the grades of the new Departments which have been recently created have also been fixed at very good starts. It is therefore requested that it is absolutely essential that the Subordinate Veterinary staff which is the essential working machinery of the Department entrusted with very responsibie and hazardeous duties, should get their due and just share. Under these circumstances the above mentioned grades are only the minimum and respectable grades which should be fixed for them. It is feared that if this opportunity when the Punjab Government is in a position to improve the grades, is not properly utilised, the Subordinate Veterinary staff will remain greatly handicapped in the coming years when all the other Departments will be much better off, socially and economically.

It is further requested that the pay of the staff may kindly be fixed according to the length of service.

This resolution to be pursued by a special sub committee consisting of the following members:—

1. Dr. Bishambar Dass Behall, L.V.P. (President).
2. Dr. Ikramullah Khan, L.M.P. (Secretary)
3. Dr. Abdul Hakim, L.V.P.
4. Dr. Ram Lal Ghulati, L.V.P.
5. Dr. Ghulam Qadir, G.P.V.C.

6. Dr. Ghulam Mohy-ud-Din Butt, G.P.V.C.
7. Dr. Ghulam Nabi, G.P.V.C.
8. Jowala Singh, G.P.V.C.

Resolution No. 2.—Resolved to request the authorities to send the members of the Subordinate Veterinary staff for special trainings at the Imperial Veterinary Research Institute or anywhere outside the Punjab at State expenses as it is always in the public interest. The official so deputed can however be asked to execute a bond for serving the Punjab Government for certain limit of period.

Resolution No. 3.—Resolved that this association re-affirm the resolutions No. 4, 5, 9 and 11 passed on 28-2-1943, resolutions No. 1, 2, 3, 5, 6 and 7 passed on 1-1-1944 and resolutions No. 1, 5, 6 and 7 passed on 26-12-1944 which are still under consideration and requests for fovourable decision.

Resolution No. 4.—In view of the fact that the Punjab Government have amended the T.A. rules and enhanced the rates, and the other Departments have either doubled the T.A. limits of their officials or have put them at very high level, where as the monthly T.A. limits have been considerably reduced for the Veterinary Assistants and Veterinary Assistant Surgeons, it is resolved to request the Director Veterinary Services, Punjab, to kindly take necessary steps to considerably enhance the monthly T.A. limits of the staff in view of the heavy touring expected from the staff.

Resolution No. 5.—Resolved to invite the kind attention of the Director Veterinary Services Punjab to para No. 7 of the Veterinary Circular No. 5 in which it is stated that the Director is authorised to elect members of the Subordinate staff to attend the post diploma course at the Punjab Veterinary College when necessary. His kind attention is further invited to the fact that the authorities of the Punjab Veterinary College have disqualified some candidates after they completed their full course at the college which is against the rule referred to above and against the practice at other institutes e.g. Imperial Veterinary Research Institute.

It is therefore resolved to request the Director, Veterinary Services, Punjab, to kindly interfere in the matter and stop the practice of disqualifying the selected members after attending the full course.

Resolution No. 6.—It is understood that the Punjab Government has decided to cause reversion of all the incumbents who had been promoted to P. V. S. Class II since September 1943, who were appointed by direct recruitment and to fill up all these posts by direct recruitment from the ex-military men and further that all the future promotions will be made on the basis of allotting 80% of such posts to ex-military men and 20% by promotions from the Subordinate staff.

The Punjab Subordinate Veterinary Service Association points out that such a step is highly detrimental to the best interests of the work and efficiency of the Department and will lead to tremendous amount of heart burning and discouragement to the members of the staff for the following reasons:—

(i) That the conditions that prevailed during this war were of such a nature that the members of the staff who remained working as civilians were also put to great hardships and inconveniences which were in no way less then those experienced under field conditions; constant vigilence for A.R.P. work, extra work due to lack of staff and increased duties, investment in war loans and exhorbitantly high cost of living were the works of great importance which have considerably contributed towards the success of the Allies.

(ii) That if the appointments are made as decided above it will bring in the Civil Veterinary Department a good number of in-experienced officers who will be quite ignorant of the prevailing conditions and the efficiency of the work will suffer to a great extent.

(iii) That this policy will deprive many of the intelligent and experienced hands from getting their well merited promotions even uptil their retirement and will thus cause a good deal of heart burning and discouragement amongst them.

(iv) That the academic qualifications of the persons who are contemplated to be appointed directly are in no way better than those of the persons who are already working in the Civil Veterinary Department and thus they have absolutely no professional superiority over the members of the Civil Department.

Under the above mentioned circumstances, it is unanimously resolved that the Punjab Government be requested to look into this grave injustice which will be done to the Civil Services and to modify its decision on the following lines:—

(i) All the present incumbents to the posts be confirmed in their posts according to individual merits and

(ii) All the future posts be filled on the basis of 50% by promotion from the Subordinate Veterinary staff and 50% by direct recruitment from the ex-military men.

Resolution No. 7.—It has been observed that in the Societies for the prevention of cruelty to Animals, all over the Province all the posts of Inspectors are given to persons with no recognised qualification with the

result that many a times even sound animals are sent to the Veterinary hospitals, causing a great deal of inconvenience to the public. Hence it is resolved that the Punjab Government may be requested to pass orders that all posts of Inspectors, in the S.P.C.A. are given to persons who are qualified Veterinarians.

Resolution Nc. 8.—Resolved that the designation of all the L.V.Ps who are appointed or may be appointed in future should be Veterinary Assistant Surgeon.

Presidential remarks:—The President then addressed the house and remarked that the association had definitely aroused a feeling of betterment and co-operation amongst its members. He stressed upon the members to continue their support to build it a pillar of strength from which abundance of inspiration and guidance can be derived. He referred to the hard times ahead and appealed to the members to gather round this common platform to get their all grievances redressed. Further he referred to the useful amendment to be made later on in the rules and regulations of the association in order to send the voice of the association to every nook and corner of the Province.

Finally he heartily thanked the reception Committee on behalf of all the members for their homely hospitality and grand arrangements made for the success of that session.

At the request of the house the meeting was adjourned for a short time. After about half an hour the members re-assembled with Dr. Ram Lal Ghulati in the chair, and the following office bearers were elected unanimously for the year 1946.

President. Dr. Bishambar Dass Bahl, Veterinary Assistant Surgeon, Gojra, Distt. Lyallpur.

General Secretary. Dr. Ikramulla Khan, Veterinary Assistant Surgeon, Narowal, Distt: Sialkot.

Joint Secretary. Syed Hamid Hussain, Veterinary Assistant Surgeon, Chak Jhumra, District Lyallpur.

Auditors. 1. Dr. Hari Mohan Bhatia, Veterinary Assistant Surgeon, Office, of the Deputy Superintendent, C.V.D. Lahore.

2. Dr. S. D. Sharma, R.V.A.S., Amritsar.

Members of the Managing Committee.

1. Dr. Ram Lal Ghulati, Veterinary Assistant Surgeon, Amritsar. (Lahore Division).
2. Dr. Mahesh Chander, Veterinary Assistant Surgeon, Pundri, District Karnal,(Ambala Division).

3. Dr. Mohd Yusaf, Veterinary Assistant Chak No. 36-S. B., Sargodha. (Rawalpindi Division).
4. Raghu Nath Rai, Veterinary Assistant Surgeon, Nawanshahar, District Jullunder, (Jullunder Division).
5. Jawahar Singh, Veterinary Assistant Surgeon, Khurrianwala, Lyallpur (Multan Division).

The next item on the agenda was to consider and approve the amendments in the existing rules proposed by S. Gurbaksh Singh of the Government Cattle Farm, Hissar and Multan Divisional branch of the association in the light of the recommendations of the managing Committee.

IKRAMULLAH KHAN,
Honorary General Secretary,
Punjab Subordinate Veterinary Service Association,
C/o the Veterinary Hospital, Norwal, District. Sialkot.

College News

BOMBAY VETERINARY COLLEGE

Diamond Jubilee Celebrations

A CALL FROM THE ALMA MATER

To All Graduates of the Bombay Veterinary College, Parel.

Dear Sir,

In continuation of the notifications published in the last March issue of this *Journal* regarding the Diamond Jubilee of the Bombay Veterinary College, we have to state the following for the information of all.

1. The Diamond Jubilee will be held for 4 days during X'mas. The sessions of the All-India Veterinary Medical Association and of the Bombay Veterinary Medical Association will be held during this period. The Hon. Sjt. B. G. Kher, Prime Minister, Government of Bombay is being approached to inaugurate the Jubilee Celebrations. Dr. Gharewal, M.R.C.V.S., I.V.S., Livestock Adviser to the Government of India, Delhi, is likely to occupy the Chair while professional papers are being read. Please give us the pleasure of your company by making it a point to attend the functions. Reception Committee will attend to your needs and comforts here without any fees. The Director of Veterinary Services,

Bombay Province is being requested to allow leave to such men who want to visit Jubilee functions. Municipal authorities and heads of Veterinary Departments of Native States are also being approached to grant leave to Veterinary Officers serving under them.

An Exhibition is being arranged on a large scale which will be very instructive, and worth visiting.

3. The success of the Diamond Jubilee is dependent upon the quality, quantity of professional papers which will be read and discussed during the Jubilee Session. Please note that we rely upon you for at least one paper. The paper should be sent typewritten, if possible, on one side of the paper before the 16th September this year. It should be accompanied with a short abstract which will be, if possible, published and distributed in advance to help discussion.

4. The Bombay Veterinary Graduates whose addresses are known have been supplied with the publications made so far in respect of the Diamond Jubilee. Those who have not received them are requested to communicate their address so as to make arrangements to send those publications to them. The Hon. Secretaries will deem it a great favour to receive communications from you regarding the action taken on item Nos. 1 and 3. Veterinary Graduates who express their desire to attend Diamond Jubilee Celebrations Committee meetings will be given due notice of such meetings.

Bombay Veterinary College,
Parel, Bombay.
26th April '46.

Yours truly.
R. N. NAIK,
Honorary Secretary.

MADRAS VETERINARY COLLEGE.

The following candidates have passed the Final diploma examination of the Madras Veterinary College held in March 1946.

1. Rama Rao P.
2. Balaprakasam R. A.
3. Vasudeva Tilak C. T.
4. Karumbiah P. P.
5. Srinivasan T. R'
   Mal Reddi K.
6. Chidambaram P. R.
7. Thrivikrama Rao K.
8. Rangamannar R.
9. Srinivasan R.
10. Natarajan S. G.
    Subramanian T.
    Madhusudana Rao N.
11. Somasundara Rao G.
12. Venkatachalam G.
13. Venkataraman R.
14. Ganapathiraman S.
15. Narasimhachari K. V.
16. Sitaraman R.
17. Saligram Mota

Madras,
30-4-1946

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

BOMBAY VETERINARY COLLEGE

List of successful candidates at the Diploma Examination of the Bombay Veterinary College 1946.

1. M. V. Moulvi
2. R. T. Desai
3. S. H. Chawla
4. S. R. Kulkarni
5. V. D. Jatkar
6. K. S. Parwani
7. A. P. Asopa
8. N. V. Bhatwat
9. B. T. Chandiramani
10. A. C. Malkani

Parel, Bombay.
9th April 1946.

S. R. CHADHA, B.SC., M.R.C.V.S.
Principal.

BENGAL VETERINARY COLLEGE

List in order of merit, of the students who have passed the Diploma Examination of the Bengal Veterinary College on the 31st March 1946.

	Names.	*Place of Origin.*	*Obtained distinction in*
1.	A. A. Quraishy	Sitamo State (C.I.)	1. Operative Surgery 2. Animal Husbandry (Part III) Dairy Science
2.	M. A. Howlader	Bengal	Animal Husbandry (Part III) Dairy Science
3.	Rafiullah Khan	Rampur State	Do.
4.	A. U. Ahmed	Assam (Govt).	
5.	Sanaullah Shah	I.V.R.I. Mukteswar-	
6.	I. F. Bari	Bengal	
7.	A. L. Sen Gupta	Bengal	
8.	Md. A. Faiz	Bengal	
9.	R. N. Som	Bengal	
10.	L. S. Dabi	Jodhpur State	
11.	A. A. Khan Suri	U. P. (Govt).	
12.	Abu Md. A. Rashid	Bengal	
13.	A.C. Ghosal	Bengal	
14.	J. N. Chakravarty	Bengal	

Belgachia, Calcutta.
17-4-1946.

J. M. LAHIRI,
Principal.

BIHAR VETERINARY COLLEGE

List of successful final year students with their position.

Sl No.	Name.	Position.	Sl No.	Name.	Position.
1.	J. L. Chaturvedi	1st.	20.	Sharafuddin Ahmad	18th
2.	B. Sahoo	2nd.	21.	O. P. Gupta	19th
3.	J. Singh	3rd.	22.	Y. Singh	20th
4.	K. M. Das	4th.	23.	B. Mahanty	21st
5.	R. N. Kunwar	5th.	24.	R. R. Siyal	22nd
6.	K. S. K. Bist	6th.	25.	Samuel Surin	
7.	S. B. Saxena		26.	Md. Abbas	23rd
8.	Hareshwari Prasad	7th.	27.	Mahabir Sahai	
9.	A. A. Khan	8th.	28.	M. G. Kale	24th
10.	Gyan Chandra	9th.	29.	R. S. Raghubansi	25th
11.	A. Zafar	10th.	30.	Narbadeshwar Pd	
12.	S. Huda	11th.	31.	Md. Azar	
13.	S. B. Mund	12th.	32.	N. A. Khan	26th
14.	M. S. Duivedi	13th.	33.	H. M. Kanjoo	27th
15.	S. N. Singh	14th.	34.	Raghubar Singh	28th
16.	P. R. Singh	15th.	35.	Nageshwar Prasad	29th
17.	B. P. Singh	16th.	36.	R. C. Patnaik	30th
18.	Ramswaroop Sinha		37.	G. H. Sumra	31st
19.	Ekramul Haque.	17th.	38.	N. S. Sinha	32nd

Patna.
20-4-1946.

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

BIHAR VETERINARY COLLEGE, PATNA.

NOTICE.

The next session of the Bihar Veterinary College will commence from the 1st July 1946.

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, 1946. 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 has 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 persons 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 1st July, 1946.

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 *-/4/- by money order*, for each copy order. 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 F, 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. Application received direct from such candidates will not be considered.

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

Provincial ... ... Rs. 200-20/2-220-30/2-280-20/2-400.

Subordinate. (a) Veterinary Inspectors. Ist 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 in lieu thereof).

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

10. Stamped & addressed envelopes must be enclosed for replies to queries etc.

PATNA,
16th April, 1946.

P. G. MALKANI,
Principal, Bihar Veterinary College.

Extracts

ARTIFICIAL INSEMINATION INCREASES FERTILITY*

BY

FRED SHELTON

(*Reprinted from Turkey World*)

Four years of practising artificial insemination on turkeys have enabled the author to assemble much information on this subject and develop a practical method of putting insemination to practice on a commercial scale. A simple detailed description of how to artificially collect semen and breed turkeys is included in this article. The method of stimulation and insemination used is basically the technique developed by W. H. Burrows, and J. P. Quinn. This was described in Turkey World for December 1942, and in the book, "Turkey Management" by Marsden and Martin.

Artificial insemination may be defined as a process of artificial breeding in which semen is artificially collected from toms and injected into the oviduct of hens with a syringe.

Artificial insemination has the following advantages over natural matings,: 1. By mixing semen from several toms, one can eliminate infertility of eggs which is due to sterile toms; 2. Egg infertility due to faulty mating mechanics is eliminated; 3. It may be used as a supplement to natural matings to correct a slump in fertility late in the season; 4. It can be used to eliminate infertility due to bad weather; 5. Artificial breeding eliminates infertility due to interference of other toms during mating; 6. It enables the extension of a valuable tom's service over a larger number of hens than is possible naturally; 7. It can be of great value to a pedigree breeder who keeps his hens in individual cages; 8. It is also a very important tool to the laboratory technician in his study of breeding problems.

A true breeder realizes that he cannot develop large, blocky birds that are so out of proportion that they cannot reproduce themselves. Such birds would become entirely dependent upon artificial means of reproduction. Therefore, plenty of attention should be given to body type, legs and body carriage as well as a broad breast.

Equipment needed

A small glass funnel is used to collect the semen. The funnel is fitted with a rubber stopper to make it easier to hold. Paraffin is used to plug the funnel's stem and coat the inside surface to prevent the semen from sticking to the glass. An insulin or a tuberculin syringe of 1 c.c. capacity may be used without the needle, (1 cubic centimeter is about the volume of 20 drops of water). The insulin syringe is preferable because the graduations are farther apart.

* The Indian Poultry Gazette Vol. XXIX, No. 1.

Storage vials should be selected which are no deeper than the length of the syringe. They should be made of hard glass because soft glass seems to have the effect of shortening the life of the sperm.

A thermos bottle may be filled with warm water, 106°F., and used to hold the semen storage vials at body temperature. A hole can be bored through the thermos bottle cork to hold the semen storage vial. The bottom of the vial stands in warm water while the semen is being collected or while the semen doses are administered to the hens.

Catching equipment is essential if many birds are to be handled. This is a labour saving device commonly found in turkey farms which usually consists of an enclosed ramp leading up to a catching box which is about waist high. This enables you to catch the birds quietly, and quickly present it to the operator for collection or insemination. Handled in this manner, they do not become as frightened or tense as birds which are caught on the ground.

Steps in collecting semen

Catch the tom quickly and quietly, without frightening him. Instruct your assistant to hold the bird on the table. The bird's breast rests on the table while the assistant holds the lower end of each thigh. It is very important for the assistant to hold the thighs loosely so that the tom will relax.

1. Grasp funnel in the right hand by circling the stem above the rubber stopper with your index finger.

2. With the palm of your left hand apply enough pressure to firmly push the meaty tail up and over the back of the bird and at the same time holding the thumb and index finger posed one on each side of the vent.

3. While holding the funnel in the right hand, the thumb and the last three fingers are used to massage the soft part of the abdomen, and giving special emphasis on the fast massaging strokes along the pubic bones in a motion towards the vent. (The pubic bones are two long bones which run parallel to each other while their prominent ends are found directly below the vent). Steps two and three must be done at the same time in order to stimulate the copulatory organ to protrude from the vent. The copulatory organ consists of two prominent folds of tissue which arise from the lower wall just inside the vent. The organ will protrude only for an instant, after which it will withdraw. Continued stimulation will make the organ protrude again and again.

4. As soon as the copulatory organ protrudes, the index finger and thumb of the left hand must reach deeply into the skin on each side of the lower part of the vent. Then slowly milk a single stroke outward towards the protrusion. Throughout this entire operation you must maintain the pressure of the palm of your hand on the tail.

5. As the semen pours down the groove of the copulatory, stop the massage action of the right hand just long enough to steady the funnel and catch the semen.

Repeat these steps over and over again until you have milked the tom dry. When you have succeeded in getting the bird to protrude the organ you have accompalished the hardest part of the operation because the milking procedure, step 4, is simple.

Do not become discouraged, because it will take a little time for you to concentrate on doing four operations at once.

Some beginners are able to get good collections from their first attempts if they have gentle birds and are fortunate enough to get an easy bird to work with.

Do not work longer than a couple of minutes with one bird. After you have the steps in mind, move through them rapidly before the bird has a chance to "tighten up".

Do not expect to get a large amount of semen from one tom. Good toms will average 0·4 c.c. (four-tenths of a cubic centimeter) which is the volume equal to eight drops of water.

Do not let the chalky white urates which are commonly found in droppings confuse you. Semen is light cream coloured. It is easy for the beginner to get urates, dropping and feather scales in the funnel. Dodge them and keep the funnel clean for the semen. Contaminations of this kind dilute and shorten the life of the semen.

After collecting all the semen you can get from one tom, draw the semen into your syringe, because if the semen is left in the funnel the next tom might contaminate it with droppings. Furthermore, the semen is highly subject to evaporation, and for this reason should not be left in an open funnel. The natural dilutant that the sperm swim in evaporate rapidly when exposed to the air. After you collect enough semen to fill the syringe, empty it into a storage vial and cork the vial.

Steps in inseminating hens

The hardest part of this operation is to force the hen to turn her vent inside out to present the oviduct. Inseminate only the hens which are in egg production.

1. The assistant holds the hen by placing her neck between his legs, grasping the meaty tail with the right hand and pushing on the soft part of the abdomen. The hen's feet dangle out to one side because the hen is held in almost horizontal position in order to present the tail and abdomen to the opposing pressure of the hands. The hen's shoulders are against the assistant's left leg and her breast is against his right leg which helps oppose part of the pressure of the opposing hands. Do not be afraid of putting on plenty of pressure. The faster you can catch the hen, get her in position and apply the pressure, the easier she will respond. The longer the operator takes the more pressure he will have to use to make the hen present her oviduct.

2. The operator fills the syringe with semen without the needle and places the syringe up the oviduct as far as it will go easily. The oviduct is on the left side of the intestine.

3. The assistant releases the pressure on the tail and abdomen and the oviduct will slip back inside the vent and at the same time the operator allows the syringe to follow the oviduct back up to its original position. The syringe should be 2 or 3 inches up inside the bird before the plunger of the syringe is pressed for the desired dosage.

When the vent is turned inside out, two openings appear. The one on the left side is the oviduct entrance. It is pink in colour, as contrasted to the entrance of the intestine on the right which is red in colour. Also, the intestine is obviously marked by the excretion of droppings when the pressure is applied.

Learning how to artificially breed

After making a thorough study of this article, assemble the correct equipment. Select some sexually mature toms which are not running with the hens. Collections of semen will be smaller than normal, if the toms are not getting at least 13 hours of day light or day light plus electric light to make 13 hours of total light each day. At first, you can practise the art of stimulating the toms without holding the funnel. After you "get the feel of it" and find the right place to massage and apply pressure, then practise holding the funnel in position to catch the product of your stimulation.

If at first you do not succeed, do not become discouraged. Try and try again. If you do not get any semen after working 2 or 3 minutes, try another tom. Practise patiently for several days on the same toms. After they have been handled many times by the beginner, he should get results; and continued practice will give better results. As you gradually develop your technique and as the birds become used to your handling, you should make good collections from practically all the toms. Hens give some operators the most trouble. Use plenty of pressure and the hens will protrude their oviducts. One should not attempt to inseminate hens which are not in egg production. In fact, it is very difficult for an experienced operator to inseminate a hen which is not in production. A hen in egg production will have a large, moist, pliable vent which will open up easily and present the oviduct when pressure is applied in the right place. A hen which is not in egg production will have a tight, small, dry vent. A hen which never has laid an egg will have a membrane over the entrance to the oviduct. If you have no turkey hens in production yet, practise on some chicken hens, which are laying. Chickens are somewhat easier to learn on than hens.

If you cannot get results and know some one who can artificially inseminate turkeys, you should watch their practice and you can probably find what you are doing wrong.

How much semen should be used?

After collecting the semen from several toms, it should be mixed thoroughly before it is ready to use. A wire guide is fitted to the syringe so that the syringe plunger can only be pulled out as far as the required dosage. This guide allows the syringe to be filled rapidly with one dose. The graduations cannot be seen when the syringe is inserted into the oviduct.

The most practical dosage is 0·05 c.c. This means that 1 c.c. of semen would be divided among 20 hens. This dosage should be repeated every 10 days.

Some semen collections are watery, while others are thick. This means that the number of sperm cells in a given volume of semen varies greatly. When a practical method of sperm count can be worked out for field use, we may use safely less dosage per hen.

Semen dilutants and storage

Some scientific investigation has been conducted on the study of poultry semen dilutants. Thus far, no dilutant has been reported for turkeys, which will give as good results as will undiluted semen.

Best results have been observed when speed was excercised in getting the semen to the hens. We try to get a collection of semen into a group of hens before it is an hour old.

The time of day for inseminating hens has been proved to be important. Best fertility has been obtained when insemination is practised in the afternoon, because the peak of the day's lay is past. Therefore, try to do your insemination when there is no hard shell egg present in the oviduct.

Artificial insemination is a very profitable operation when one figures the increased number of poults which can be obtained out of every 1,000 eggs set. As long as we get 85 to 90 per cent fertility naturally, there is no need for artificial insemination. But anytime during the season that fertility drops below 80 per cent, it is profitable to breed the hens artificially because insemination done properly, can increase fertility in approximately 90 per cent.

SOME CLINICAL SIGNS OF BRAIN LESIONS*

Discussion by the Central Veterinary Society.*

***Mr. T. L. Wright*:**—The following cases have been observed during the past 25 years and although they mainly concern the horse, they will undoubtedly also be of interest to the small animal practitioner and the pathologist.

Case No. 1.—A chestnut gelding, purchased when six years of age, apparently sound and a good worker. At seven years of age it started kicking and became increasingly resentful of being harnessed to the vehicle in which it worked. In the course of a few months it became such a dangerous and protracted undertaking to get it "put-to" that it was left harnessed to the vehicle and fed from a nosebag at mid-day, while the other horses of the stud were stabled and fed It continued to work normally, but observation disclosed that it exhibited peculiar behaviour in the stall, standing for long periods with its head under the manger, or pressed against the wall. Destruction was advised, for reasons of safety, but there was some delay because the animal belonged to a Corporation which had to wait for a meeting of the Highways Committe. Instructions were given that the horse should meantime be put in a loose-box and not worked. After about a fortnight it suddenly became very violent and charged madly round the box. It was destroyed in emergency, without damaging the brain. The latter was removed and a psammoma about the size of a small domestic hen's egg was found to be present.

Case No. 2.—A bay gelding, harness horse ,aged about twelve years. This animal suddenly changed from a normal temperament and showed symptoms of ill-temper, kicking and biting—followed by a progressive incoordination of movement, and peculiar behaviour in the stable, similar to case No. 1.

"Veterinary Record" Vol. 58, No. 11.

It was destroyed, without damaging the brain, and again a psammoma was found.

Case No. 3.—A chestnut polo pony, five years of age, imported from Australia in the early part of the year. In the latter part of April it suddenly exhibited epilept form convulsions and amaurosis, maintained a temperature of 105°F. for three days, lay on the ground and was unable to rise. Experience gained from cases 1 and 2 led to the hasty diagnosis of "probable psammoma". The mare was destroyed without damaging the brain. Examination did not disclose psammoma or any other adventitious growth. The brain was sent to the late Sir John M'Fadyean, who reported that it was a case of acute encephalitis, from which the animal could not have recovered.

In the light of reports from the U.S.A. in recent years, on equine contagious encephalo-myelitis, and my own observations of that disease in Argentina in 1941, I often wonder if this may have been the cause of encephalitis in this imported Argentine mare.

Having mentioned this disease, I should like to remark at this point, that, although I saw a widespread outbreak of it among horses, I have not seen a mule affected by it, and none of the people with whom I was in contact in South America had seen it in these animals, although it was believed mules there were liable to it. At a time when this disease was very prevalent among the local horses, we had under our care nearly 2,000 mules, and inspected many others. A few of them showed decidedly suspicious signs of contagious encephalities, but when in a strange country it is generally advisable to be guided, to some extent, by local knowledge, and I was assured by laymen of considerable experience that these mules were suffering from the effects of eating a poisonous fungus, and that they would recover if put on to a different pasture. This procedure proved effective in all but one case, which was still showing considerable inco-ordination of movement when I left the country, and I do not know the result. We had to consider the advisability of protective inoculation but in view of the observations which I have just mentioned and because the available vaccine was all urgently wanted for horses, labour was scarce and expense had to be given some consideration, it was decided to take no action. Wheather this was altogether wise I am not prepared to state, but subsequent results were certainly uneventful.

Case No. 4.—A bay gelding carriage horse, aged about 12 years. One morning the coachman thought the horse was dull and listless and attempted to give it a drench. When its head was raised it staggered and pressed against the wall with convulsive movements, described by the coachman as a "fit". I saw the horse about half an hour later. It was dull, disinclined to move without strong urging, and affected with maurosis. There was cataract in each eye, but not enough to cause complete blindness. Enquiry showed that for several months this horse had been in the habit of walking in a circle in its loose box at night, twisting the straw bedding into a cone in the middle of the box by morning. It was destroyed without damaging the brain, which was found to contain a psammoma in each lateral ventricle. Each completely filled a ventricle. They were sent to the Royal Veterinary College Museum.

Case No. 5.—A Cleveland Bay harness gelding, 15 years of age. An urgent call was received to what was described as "a horse with colic and peculiar behaviour and sweating profusely."

Enquiry showed that it had eaten the evening feed normally and at 7 p.m. appeared to be normal. At 7-45 p.m. it was seen to be standing with the muzzle resting on the bottom of the manger, with the near elbow dropped, and it was sweating profusely all over. When I arrived it was standing with a fixed expression of the eyes with the off elbow dropped, suggesting radial paralysis. It was standing away from the manger, in the middle of the box; it was sweating, and the pupils were dilated with complete amaurosis. On being handled, although spoken to, there was sudden tension of the muscles of the back and loins and flexors of the neck; the hind legs were spasmodically thrust forward close to the heels of the fore limbs and the animal nearly fell. The whole movement was similar to that of a horse with tetanus, when suddenly touched. It may have been deaf, but unfortunately no test of hearing was applied. Enquiries revealed that it had stood in a stall for years, but in recent months had become spiteful and inclined to kick at anybody passing, and was not "doing" well. Put in a quiet loose-box, it had become more placid and improved in condition.

Three weeks before my visit it had fallen, without apparent reason, on a good level road while at excercise in harness; it lay still for a few minutes, then rose and went on apparently normally, but is reported to have had a temperature of 101°F. to 102°F. for a week. It was not seen by me at that time and was put back to regular excercise or light work. Warning was given that a brain tumour was suspected and that it was probable that the horse would have to be destroyed, but further close observation would be necessary.

During the next hour the condition of the animal became worse; it fell and was unable to rise, muscular spasms became weaker, coma followed, and about two and a half hours after the onset of acute symptoms, the horse was destroyed by means of a humane killer. This damaged the brain to some extent, though not greatly, and about the size of a dried haricot bean, attached by a long slender pedicle to the floor of a ventricle. The brain was taken to Dr. Tom Hare, who very kindly undertook to carry out a pathological investigation. He found two other small tumours and reported that each of the three was a psammoma.

Case No. 6.—"Ear Fistula".—A six year old polo pony mare, purchased in Ireland a few months before I was consulted about her, was said to have become irritable in temperament after arrival here, and was not schooling well. My attention was directed to a small sinus at the base of the near ear, which was alleged to be the result of an injury sustained in transit. Exuding from it was an evil smelling, slimy liquid. It was obviously a dangerous eyst, or socalled "ear fistula". The mare was cast and chloroformed on two occasions with an interval of 14 days. On the first occasion an object resembling a equine cheek tooth in a state of caries was removed, followed by a larger irregular mass which had the appearance of three malformed cheek teeth fused together. The removal of the latter required considerable force.

On the second occasion, a large, fairly smooth mass was removed, which slightly resembled a cheek tooth in structure. Removal of these masses left a large cavity, which eventually completely healed. In the course of three months the mare acquired an equable disposition and became a first-class polo pony.

Case No. 7.—Fractured Skull.—A chestnut polo pony gelding, nine years of age, received a severe blow on the head while at full gallop. It fell instantly

and lay on its side. Although unconcious, its legs continued to move with a galloping action for several minutes and it bled copiously from the nostrils. On examination it was found that both cranial bones were fractured, the right side being markedly depressed. While still unconscious, the patient was partly dragged and partly lifted into a motor horse-box and taken to a stable about a mile away, by which time it was on its feet, with a very unsteady gait. If left untied in a loose box, it walked incessantly in a circle. Secured to the manger on a short rack chain, it remained still and made no effort to break loose. It was kept tied up in a quiet box, fed on bran mashes, steamed hay and green food, and given pot. iodide in drinking water night and morning. No attempt was made to elevate the depressed fracture. That was deferred as a probable requirement, but early signs of steady improvement made it unnecessary. Inhalations of tinct. benzoin co., in steam were given three times daily. The pony recovered. The following season it was played regularly and sold at auction for a fair price.

Case No. 8.—I can make only brief comment on this. In the early days of the recent war, a polo pony being broken to harness, attached to a heavy log, reared and fell backwards and struck its occiput on the log, sustaining concussion of the brain. The pony became very violent, with convulsive movements, and could not be restrained in the stable. The animal was destroyed but no post-mortem examination was made.

DOGS:—

By the courtesy of the Imperial Chemical Industries, Ltd., Mr. Ogilive exhibited to the recent Annual General Meeting of the Society of Veterinary Practitioners, an early Russian film showing cerebrectomy on the dog, and its results. I found it of particular interest, and regard it as a great stimulus to the much needed investigation of morbid conditions of the brain of small animals.

In general practice we often see cases in which a dog, or sometimes a cat, walks in a small circle, or with the head turned to one side or semi-rotated on the long axis of the neck. We presume that this is due to cerebral pressure, and many of such cases yield to treatment.

Amaurosis associated with distemper may arise from affection of the central nervous system, and in my experience many cases recover if treatment be adopted in time—before degeneration of the optic nerve occurs.

I have never seen a tumour of the brain of a dog confirmed on *post-mortem* examination.

In conclusion, I would stress that important signs of cerebral disturbance in the horse, though not specific, are:—

1. Newly acquired irritability of temperament—kicking, laying back the ears and shaking the head.

2. Suddenly falling, without such apparent cause as stumbling or slipping.

3. *Amaurosis.*—In this connection, the four cases described, in which brain tumours were found *post mortem*, were all in harness horses habitually working in blinkers. The suspect in which no tumour was found was a polo

pony, and had never worn blinkers. In the old days of carriage horses there were apparently many cases of so-called "megrims", "blind staggers" and "stomach staggers". It is more than likely that some of these conditions were due to tumour-like formation in the brain. Is it probable that the wearing of blinkers, restricting the amount of stimulus from light and limiting the range of vision, may play some part in encouraging the deposit of cholesterin crystals within the ventricles of the brain and in the optic chiasma?

Dr. J. McCunn:—I have listened with pleasure to Mr. Wright's remarks on cerebral troubles in the horse—and would thank him on behalf of the older hands who became veterinary surgeons primarily because of the horse.

I can claim to have an experience which is almost as long as Mr. Wright's and, like him, I have seen a fair number of these cases. It is not a difficult matter to come to the conclusion that an animal has brain trouble. It is an entirely different thing, in such an animal as the horse, to diagnose either the seat or the nature of the lesion. Generally speaking, they may be classified into two groups; those which are characterised by excitement or irritability and those which are characterised by simple change in conduct, dullness, stupidity and alteration in gait. The former type are usually associated with meningeal troubles and the latter with the deeper structure.

I have seen these brain troubles change in type. When I first came to London the principal one was a condition called "megrims" with an occasional "psammoma". When one found a tumour in the ventricle it put a satisfactory end to a case but as I have known of psammomas being found in horses dead from other causes, and also in those which had been in apparent health before being killed, I have had some doubt as to the correctness of some previous diagnosis.

The megrims now seem to be a thing of the past and psammomas are less frequently encountered. In their place there is one trouble which has caused me considerable concern, namely, "head shaking". The affected horses developed this when warmed up. I have encountered it in draught and riding horses. Such animals usually bore to one side of the road and in many instances they are unsafe to use on the streets. They perform as if they have a persistent fly in their ear. In some cases if the ears are thoroughly cleaned the symptoms will abate, and in others a felt pad under the poll-strap seems to help. In three cases good results followed a course of iodide of mercury and arsenic. It would be interesting to know the nature of origin of this condition. In my experience the consideration is often serious enough to render the animal useless for work.

Another modern condition is one which I associate with calcium deficiency, I have no biochemical proof that this is so but the adminisiration of calcium, preferably intravenously, in the first instance seems to control the symptoms. Affected horses appear more nervous than usual, they have locomotor trouble, especially with the extensor muscles. They stumble easily, especially when going down hill, and they appear to have slight visual defects. They eat quite well, are normal in their natural functions and have no elevation of temperature, but the pulse may be accelerated. There is one reflex action on which I greatly rely in such cases and that is the orbital one. If one taps an animal over the zygomatic region the reaction is usually a blink of the eye. In the case to which I allude this blink is followed immediately by a series of small blinks or tremors. This is a reflex which is almost pathognomonic. Incidentally,

a similar reaction will usually be experienced in a cow suffering from milk-fever, even in the early stages of the disease, and also in the dog. In the dog there is a definite condition which yields to calcium and I have seen many cases, but as was the case in the horse I have no biochemical data to support my supposition that it is a calcium deficiency. I hope to make further investigation into the matter in the near future.

In my opinion "shivering" is a condition which should be classed amongst the deficiency diseases. It has long been known by certain horse dealers that rest, good food and cod liver oil will settle many shiverers. It is a well-known fact that *vice versa*, anything which interferes with adequate nutrition or any febrie upset such as strangles or stable fever in young horses will lead to an accentuation of the symptoms. Likewise, a long train Journey has the same effect. I cannot support those who believe that the bony deposits in the lumbar region have any marked influence or effect on this condition, for most town horses which reach any reasonable age show these and still show no evidence of "shivering". In conclusion I would ask the meeting whether in their opinion animals suffer from headache. If they do, and I can see no reason why they should not, how does one diagnose such a condition.

GRNERAL DISCUSSION

There was considerable discussion on the subject,

Mr. S. F. J. Hodgman spoke of a polo pony he owned in India which developed brain symptoms with excitement. He asked for details of the method of destruction used by Mr. Wright in which care was taken to avoid damaging the brain.

Mr. W. A. Pool, referred to the equine encephalomyelitis that had caused serious losses in the United States and Canada, in South America, Russia, India and elsewhere, and to the types of virus that were responsible. He also spoke of the infection in human beings with the virus of equine encephalomyelitis and its isolation from wild birde in certain aflected areas.

Dr. T. Hare, explained that he had not yet completed his examination of the material from the case referred to by Mr. Wright.

Dr. J. T. Edwards referred to encephalomyelitis in horses in India and the work done there by Shirlaw which indicated that "kumri" is a sequel to this infection.

THE REPLY

Mr. T. L. Wright said that he felt gratified by the discussion which his comments had aroused and the hoped that the younger members of the profession would thereby be stimulated to increased interest in the brain of the small animals.

Dr. Edwards had mentioned instances of army horses in India affected with paraplegia. He (Mr. Wright) had seen a few similar cases it army horses In Mesopotamia in 1917, and the condition was then spoken of as contagious spinal meningitis. He agreed with Dr. Edwards that there is great need of the further study of the neurology of the domesticated animals.

Dr. Rare's report on the pathology of Case No. 5 would be awaited as a very valuable contributlon to this discussion. His remarks on arteriosclerosis and consequent changes in the meninges were of interest. The suggestion that coccidiosis may be associated with hysteria in the dog recalled to his mind a case in which a young dog which had repeated attacks of hysteria and "fits" not attributable to distemper had been reared on premises where an older dog died suddedly, apparently from coccidiosis.

Mr. Pool's reference to encephalo-myelitis reminded him that while he was in Argentina he understood that this disease in the horse was notifiable primarily on account of its communicability to human beings.

With regard to Professor McCunn's statement that there were many instances of psammomata having been found in the brain of horses which had shown no clinical disturbance, it must be borne in mind that clinical signs of disturbance would depend on pressure, and he would ask Professor McCunn the following question—which he did not expect him to be able to answer—*viz. Re* those psammomata which had been found *post-mortem* in horses which had shown no clinical signs, if the horses had been able to live a little longer, could it be said that those tumours would not eventually have caused some pressure disturbance with resultant clinical signs?

A few "head-shakers" had been observed, but there had been no opportunity to follow one to its end; they were generally sold. He agreed that there was no way of diagnosing headache with accuracy in an animal, but assumed it did occur in such conditions as nephirits, etc.

Mr. Hodgman had asked about the method of destroying a horse without damaging the brain. The earlier cases mentioned were done by a knacker who was expert at inserting a knife in the occipitoatlantoid joint but, unfortunately, he was not available for case No. 5.

SUPPURATION OF THE ANAL POUCHES.*

By

WILLIAM J. LENTZ,

University of Pennsylvania.

In the dog the anal pouches or sacs, one on each side, are comparable to those found in the shunk. Morphologically they might be regarded as diverticuli of the anus with which they communicate by a circular orifice on either side of its margin. They are lined by a modified skin (a continuation of that lining the anus) containing coiled glands which secrete a fetid, grayish or brownish oily substance This ejected through the small openings facilitates the passage of the feces, which in the healthy dog are firm, containing very little moisture and if bones are a part of the diet so hard as to be almost powdery. The dog by nature is a constipated animal and the soft stooling so frequently noted in the dog of today pre-disposes to suppuration of the anal pouches, in that it fails to stimulate secretion and expulsion of a lubricant so essential to the passage of a natural or firm, dried out stool. The pouches become patulous, infection enters, suppuration occurs and they eventually become distended with a viscous, more or less purulent matter, frequently

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resulting in a chronic discharge, which is particularly objectionable in house kept dogs. The animal may succeed through its own efforts in bringing about expulsion when the sacs are distended. Sometimes the suppurative inflammation and subsequent distention may be so great that the discharge may break through the skin immediately outside of the anus (usually preceded by an angry, red or purplish swelling) and cause a fistula. The fistulous tract may often heal spontaneously, but will recur later, however.

Infection of the pouches is made manifest by a pruritus ani, by the animal's frequently licking or biting at the anus or dragging (rough-locking) it along the floor. Defecation may be suppressed because of pain and may result in coprostasis. It is only natural to assume that just as with a focal infection anywhere in the body suppuration of the anal pouches may play an important part in other disorders.

Treatment.

With the index finger and ball of the thumb alongside the anus, first locate the distended pouch, compress it and thus evacuate the contents. Next, with the animal in a standing or ventral position, dilate the anus with a rectal speculum, the two blades of which should be placed in a dorsal and ventral direction. The excretory orifices of the two sacs are thus readily exposed to view laterally, immediately within the lumen of the anus. Next, insert into the small excretory orifice a 16 gauge milk teat cannula, (either straight or curved) with a syringe adaptor or one may use a large gauge hypodermic needle, the point of which has been filed blunt. The contents of a hypodermic glass syringe, containing approximately ½ dram of Squibb & Sons Novoxil 5% ointment (which has been melted by holding it under a hot water tap) is injected into the orifices until the pouches are distended. The ointment should remain in the pouches for four to five days, then expressed. It is sometimes necessary to repeat the treatment. When the suppurative inflammation has broken through the skin resulting in a fistulous-like opening we simply resort to the simple expedient of inserting a groove director into the fistulous tract and with a scalpel enlarge the opening. Now with the index finger in the rectum so as to avoid injury, curette the wall of the sac, mop up the blood with dry cotton, then swab the cavity with pure phenol (do not limit its action by alcohol). The after treatment is the same as with an abscess in other parts of the body.

The simple procedures as here outlined have for so many years given us such consistently excellent results that it seems to us to practically obviate the neccessity of restoring to the radical operation of extirpation.

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