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THE INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)

A Bi-Monthly Reforo of
Veterinary Scienc

(ESTD. 1924)

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THE INDIAN VETERINARY JOURNAL

[THE JOURNAL OF THE ALL-INDIA VETERINARY ASSOCIATION]

PUBLISHED ON ALTERNATE MONTHS

★

A Bi-Monthly Record of Veterinary Science
Devoted to the cause of the
Veterinary Profession

★

EDITOR

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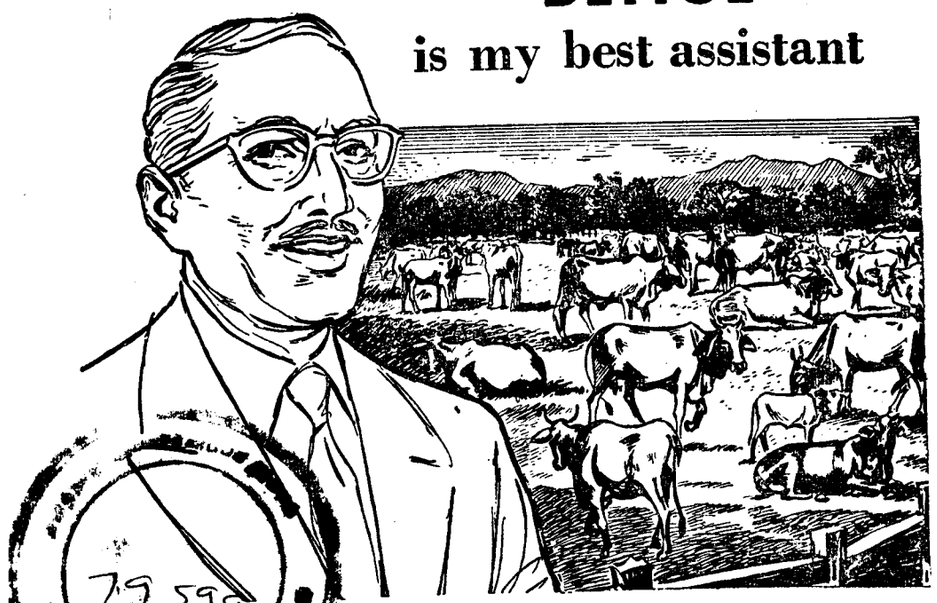

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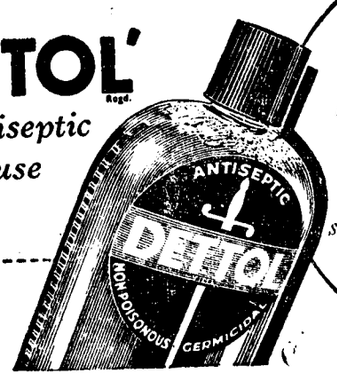

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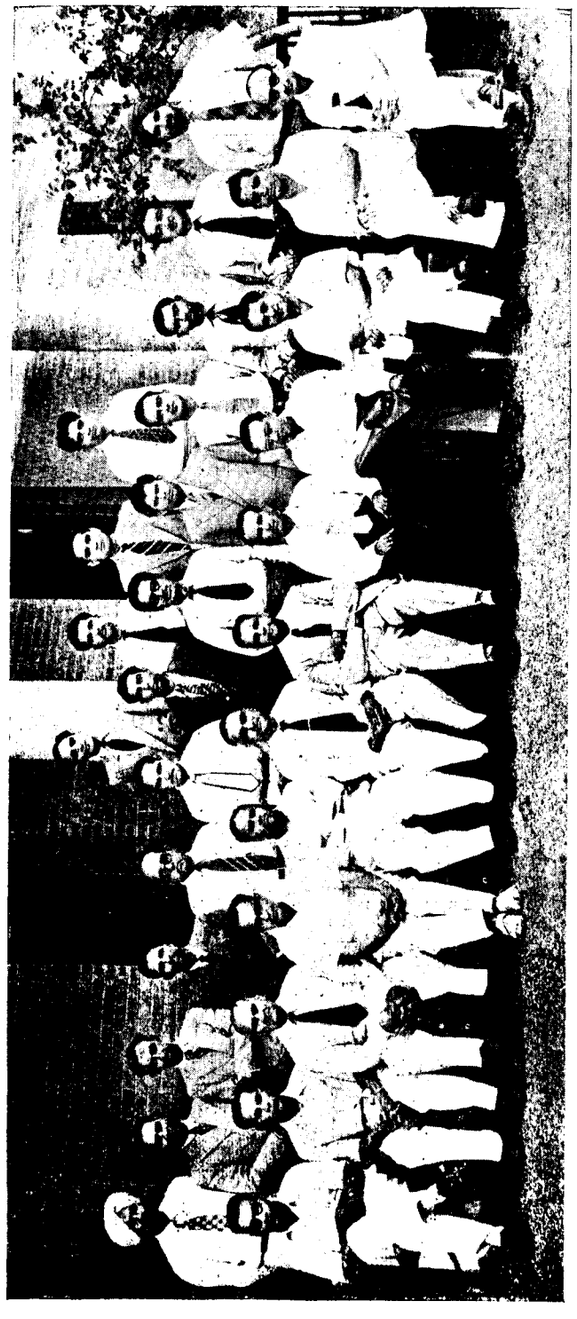

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RAI BAHADUR P. N. NANDA, M.R.C.V.S.,
ANIMAL HUSBANDRY COMMISSIONER WITH THE GOVERNMENT OF INDIA,
Who Retired On 5 - 11 - 1956

THE
Indian Veterinary Journal
(The Journal of the All-India Veterinary Association)

Vol. XXXIV JANUARY, 1957 No. 1

We Wish Our Readers A Happy and Prosperous New Year !

Editorial

A SELF-DEFEATING POLICY

They say Governments like the weather can sometimes be highly erratic. We are led to believe in this enigmatic statement from what we have heard about certain proposed appointments in some of the States. We make no secret of the fact that it takes our breath away to learn that in these days of hurricanic development of Science, there are Governments who think that non-professional men could be the heads of professional Departments! We are not one of those who believe that like individuals, even Governments have their own axes to grind. We do believe that every State Government is eager to advance and benefit the country at large. But the methods they seem to be thinking of, are a little out-moded and belong to a forgotten age when men and materials were scarce. We have cried ourselves hoarse in these pages that only duly qualified Veterinarians should be posted as heads of Animal Husbandry Departments and to all other key positions in a State, such as Principals of Colleges, Livestock Development Officers and

Milk Commissioners. But we learn on reliable authority that proposals are under way in one or two States to have I.A.S., Officers as heads of Animal Husbandry Departments, Milk Commissioners etc. There cannot be a worse self-defeating policy than this one for any Government to adopt. It will have just the opposite effect of what the Government have in view - we concede - with the best of intentions.

Fancy the embarassment and inconvenience to a non-professional Director, watching and directing Research Schemes in Parasitology, Bacteriology, Physiology, Animal Nutrition, Genetics, etc., not to speak of the prevention and control of various bacterial and virus diseases. It is asking for the impossible. They cannot sufficiently enthuse themselves on matters, which are beyond their comprehension. They soon learn to adopt a policy of drift and the administration goes on. They know they are merely birds of passage in a professional Department and all their prospects lie in their main field of Administrative service. So we miss that dynamic drive and sustained good work which could only be expected of men who belong to the profession. Their lot is cast in the profession and they have so much to loose if they are indifferent in their work. It is an irony of fate that such a patent fact in life is conveniently forgotten by the Government and they do an act which no other private agency would think of ever doing *viz.* having non-technical men for highly specialised technical work.

Even the recent Government sponsored Indo-American Team has said in definite terms the evil effects of such a purposeless policy. We make no apology for quoting their remarks *in extenso.* "The direction or supervision of research or educational programmes in agriculture, *as in any other field*, must be entrusted to individuals who have *a full understanding of the problems, requirements and potentialities in these technical fields.* The head of the Research Instituition must be a stimulating, driving force capable of perceiving the nature of complex problems, determining the feasibility of the various research approaches and fully understand that research in many instances

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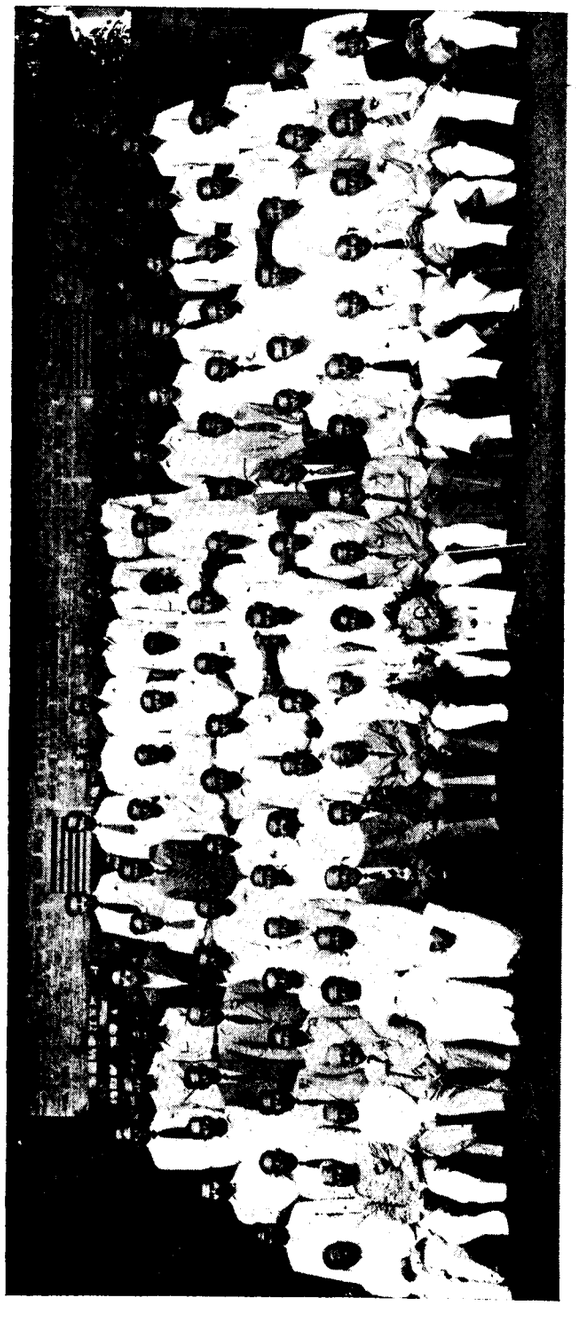

THE MADRAS VETERINARY ASSOCIATION

Farewell Party to Sri A. B. SHETTY on 26-10-56.

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THE MADRAS VETERINARY ASSOCIATION

PRESENTATION OF A SILVER BULL AS A MEMENTO TO
Sri A. B. SHETTY

MAHESHWAR PRASAD SINGH, G.B.V.C. (Pat.), M.S. (Minn.),
Animal Husbandry Dept., Bihar, who returned recently from U. S. A.

must be slow, laborious and, in numerous instances, unproductive. Such proper technical leadership will lend stability and provide for continuous progress in research. The same general qualities are required in the education and extension fields. *There is a tendency in some States or Institutions to place non-technical Administrative Officer in charge of Agricultural Research, Education and other technical services. This is a move toward mediocrity in technology.*" (Italics are ours). And yet they think of I. A. S. Officers as heads of professional Departments and for such highly specialised posts like Milk Commissioners, etc. A more retrograde step it is impossible to conceive. There are men within the Animal Husbandry Departments who are academically highly qualified and sufficiently experienced to hold the posts of Directors, Milk Commissioners, etc. If there are no suitable men within the profession for such posts, we submit there cannot be any outside the profession. It may be administrative convenience to run such a show but it cannot be scientific development. Science will soon come to a stasis if such an un-scientific attitude is assumed by our enlightened State Governments. We appeal to them not to pursue this policy of discouragement of professional men and thus bring about a scientific morass, now that India is on the threshold of a great era, with new and expanded States to plan and programme.

MADRAS BIDS FAREWELL TO A POPULAR MINISTER

Reorganisation of States brought in its trail very many sad partings. But nothing was sadder to Madras than the departure of Shri A. B. Shetty, a popular Minister. This was evident from the number of farewell parties he has had from all levels of Society and the sentiments given expression to at the various functions. The senior-most member of the Madras Cabinet, he was liked very much for his urbanity of manners and quick understanding of the many problems within his portfolio. His departure is a distinct loss to Madras at Cabinet level.

To the Veterinary profession in particular he was a great patron; a true friend, philosopher and guide. His connection with our profession began long before he ever sat in his Ministerial gadi. His searching interpellations as an ordinary member of the old Legislative Council in the early twenties of the present century found in him a champion of our cause not by our choice but by his own inclination. So it was but fitting that the Madras Veterinary Association should have got up an excellent farewell party at 'Woodlands Hotel', Madras, on the 26th October 1956, where both officials and non-officials of our profession mustered strong to wish him good-bye. The Hon'ble Minister for Finance Shri C. Subramanyam presided. He said "Mr. Shetty has not been holding the portfolio of Animal Husbandry in recent years and there is no possibility of his ever doing so hereafter in Madras and yet the Veterinary profession has thought it fit to get up this function and bid him farewell. In that way this is a unique function and speaks highly of the members of the Veterinary profession in Madras." A small souvenir in the form of a silver bull suitably mounted on wood work was presented to Shri A. B. Shetty, which he said he was accepting as a memento of the good work that is being done by the Animal Husbandry Department in Madras.

Shri Shetty is now the Public Health Minister in the expanded State of Mysore. What is loss to Madras is a distinct gain to Mysore. We wish Shri Shetty a long spell of useful service in Mysore!

An account of the function by the Secretary of the Association appears under Association News elsewhere.

RAI BAHADUR P. N. NANDA RETIRES

We learn that the Animal Husbandry Commissioner with the Government of India, Rai Bahadur P. N. Nanda, M.R.C.V.S., has retired from service on 5th November 1956. Thus a great personality in the field of Veterinary Science in India has been necessitated to abandon 'active service' at the zenith of his ripe

experience on what is dubiously known in India as 'superannuation'. Out of sheer curiosity we looked into the dictionary to know the exact meaning of this terminology. It is a state of being "impaired or disqualified by living beyond the years of service or by old age". Are these disqualifying conditions brought about at the age of 55 in India? We leave the answer to those who could judge without favour or prejudice.

Mr. Nanda leaves behind a glorious record of service of nearly 30 years in various capacities. His work for the improvement of Dhani breed of cattle, improvement of sheep and camels in the Punjab are too well known to need repetition here. As Superintendent of the Government Cattle Farm at Hissar, he brought under control the heavy incidence of Tuberculosis and laid the foundation for development of Hariana breed of cattle and Hissardale breed of sheep with improved quality of wool. He held the post of the Director of the Animal Husbandry Department of two of the major States *viz.* the Punjab and Bombay and finally assumed charge of the high post of the Animal Husbandry Commissioner with the Government of India in December 1947. It was there his great qualities of head and heart were much in evidence. His genial temperament smoothened his way to success. His high personal qualities added charm to his commanding personality and brought him many friends wherever he went. He held the high office of the Animal Husbandry Commissioner in what may be termed as the transition period from the old bureaucratic days to the democratic days of the present day with all its attendant uncertainties and irregularities. He was the first Indian Animal Husbandry Commissioner in the post-independence days of this great country and as such had to face new and novel situations, which he did with calm demeanour and with great success.

He believed in quiet work and never sought the lime-light and was thus able to leave behind an enviable record of good work. To mention only a few, the total amount sanctioned by the I.C.A.R. for the several Research Schemes in Animal Husbandry rose from 12 lakhs to 31 lakhs of rupees during his

tenure of office. It was largely at his instance the various Research Schemes have been undertaken on a regional basis and the co-ordinated schemes on Cattle Sterility, Bovine Mastitis, Sheep and Wool Development, etc., received the necessary fillip. The Rinderpest Eradication plan is another land-mark that will be associated with his period of office. Four New Veterinary Colleges were opened and arrangements were made for more number of admissions in the existing Veterinary Colleges. We could not however see eye to eye with him with regard to the length of the 'emergency course' recently introduced *viz.* 2 years. We prefer the Madras scheme of one year. A two-year-course is too long a period for an emergency. It is neither the one nor the other.

We have had the pleasure of seeing him preside over several Conferences and meetings and we make bold to say he had very few equals in the superb way of conducting the proceedings. Tact, patience, clear exposition, brevity and firmness were all in evidence.

Writing in 1948, soon after his appointment as Animal Husbandry Commissioner, we said "By far the pressing need of the Veterinary Profession in India, is the formation of an Indian Veterinary Council and, as the head of the profession in this country, we expect Mr. Nanda to take early steps in the matter". That he did succeed in this matter is now a part of the history of our profession in India. But for his tactful handling of the problem, we could not have achieved this object so early and so easily. The profession has cause to remember him for this one act, if for nothing else. We wish this highly respected and loved member of our profession, a long and useful retired life!

Till the time of our writing, we are given to understand that his successor in office has not been selected and we have not the least doubt that the Government of India will make the right choice at a very early date.

Original Articles

'KEMITHAL' SODIUM AS A GENERAL ANAESTHETIC FOR CATS

By

Jose B. Aranez, D.V.M., M.S.,

and

Jose V. Tacal, Jr., D.V.M.,

Quezon City, Philippines.

A satisfactory anaesthesia is one of the requisites in order to attain proficiency in surgery. Its importance in veterinary surgery has long been recognized. During surgical operations, an anaesthetic does not only relieve pain and enable the patient to be properly controlled and relaxed but it also increases the technical efficiency of the surgeon. However, the pitfalls in the use of general anaesthetics can be avoided by the wise selection of those anaesthetics which will give the best results with the least apprehension of danger to his patients.

One of the most recent general anaesthetics for small animals is 'Kemithal' Sodium. Its availability locally has alleviated, to a certain extent, the shortage of satisfactory general anaesthetics for small animals which has been a constant problem among veterinary practitioners in the Philippines.

Jones[1] citing Carrington and Raventos, reported that the duration of action of thialbarbitone sodium (Kemithal) is "between the short-acting and the ultra-short-acting barbiturates." The same author also reported that Parry in 1950, found out that a 10 per cent solution of 'Kemithal' Sodium, when injected intravenously in doses ranging from 30 to 45 milligrams per pound body weight, could produce general anaesthesia lasting for about 15 minutes in dogs and cats.

Edds and Trace[2] reported prompt anaesthesia in five minutes lasting for an average of 50 minutes when 5 cats were given 'Kemithal' intrapleurally from 40 to 50 milligrams per pound body weight. The same workers cited the report of Harrow on the use of this drug for

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Dr. Aranez is an Instructor in the Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of the Philippines, Quezon City and is foreign corresponding Secretary for the A.V.M.A. in the Philippines. Dr. Tacal is a recent graduate from the same College.

This work was conducted in the Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of the Philippines, from April 9 to October 24, 1955.

'Kemithal' Sodium, a product of the Imperial Chemical Industries, Ltd., Manchester, England, was supplied through the courtesy of Messrs. Wise & Co., Inc., Manila, Philippines.

dogs and cats with doses from 20 to 45 milligrams per pound body weight, anaesthesia lasting from 10 to 180 minutes and the work of Barnes who used doses from 30 to 40 milligrams per pound body weight given intrapleurally with an average duration of anaesthesia from 120 to 180 minutes in cats.

In the Philippines, Aranez and Forteza[3] observed an average duration of surgical anaesthesia from 19 to 116 minutes with therapeutic doses from 20 to 40 milligrams per pound body weight of this drug on 38 native dogs.

Materials and Methods

A total of thirty-seven native cats of both sexes (17 males, 18 females and 2 castrates) varying from 3·3 lbs. to 9·46 lbs. in weight, and from nine to thirty-six months in age, were used in this experiment. Two or three cats were used at a time. They were kept in a cage measuring 2′ x 2′ x 5½′ with three equally divided compartments. The cats were fed once daily for five days or a week before the experiments. Fresh and clean drinking water was accessible to them all the time. Faecal and other examinations were made of each cat to determine their suitability for the experiments. Cats heavily infested with parasites and those suffering from other ailments were discarded.

The general anaesthetic used was 'Kemithal' Sodium, the sodium salt of 5-$\triangle^{2:3}$-cyclohexenyl-5-allyl thiobarbituric acid, a new non-volatile, short-acting intravenous barbiturate manufactured by the Imperial Chemical Industries, Ltd., Manchester, England. It is in powder form, possessing hygroscopic properties and readily soluble in water. It has a pH of about 10·6 when in 10 per cent aqueous solution. This solution has been found stable for a week when kept at ordinary refrigerator temperatures. The drug is available in one-gram, two-gram, and five-gram ampoules. In this work, the one-gram ampoules were used.

Two days before the actual experiment, the body temperature, pulse and respiratory rates were taken every day. To simulate the actual surgical conditions, the experimental cats used were fasted 16 to 24 hours before the anaesthetic was injected. Five minutes before the injection, the temperature, pulse and respiratory rates were again taken. Each cat was then weighed for the computation of the doses.

Prior to injection, each cat was restrained by placing it on its side on the operating table with the aid of a helper. The site of injection selected was the femoral vein on the medial side of either the left or the right thigh. This site was shaved and then disinfected with 70 per cent ethyl alcohol.

To test the therapeutic doses, fifteen cats were used. The minimum therapeutic dose chosen in this study was 20 mg. per pound body weight, as it was found out in a preliminary trial that 15 milligrams per pound body weight cannot induce surgical anaesthesia. Higher therapeutic doses in the amount of 25 milligrams and 30 milligrams per pound body weight were also used in this experiment.

To ascertain the toxic doses, four cats were used. Two cats were given 31 milligrams, and another two, 32 milligrams each per pound body weight.

To determine the lethal dose, ten cats were used. The lethal doses in this investigation were determined by taking 33 milligrams per pound body weight as the minimum lethal dose (M.L.D.), so that the corresponding higher lethal doses tried were 33⅓, 34, and 35 mgs., all per lb. body weight.

In all intravenous injections, the rate of administration was 1 c.c. per 30 seconds of 10 per cent aqueous solution of 'Kemithal' Sodium.

The body temperature, pulse and respiratory rates of each cat were recorded at five-minute intervals during the stages of surgical anaesthesia and of recovery. Observations were also made on the physical changes in the animal during the induction, surgical anaesthesia, and recovery stages. As soon as the corneal and pedal reflexes disappeared, the skin, ears, tail and muscles of the abdomen were pinched with a pair of artery forceps to ascertain the depth of surgical anaesthesia. The duration of the stages of induction, surgical anaesthesia and recovery and the duration of injection, until surgical anaesthesia was reached, were also recorded. In this work, the period of recovery is that period elapsing from the time the pedal and corneal reflexes and consciousness appeared up to the time the animal stood up.

To evaluate the anaesthetic value of each therapeutic dose on actual surgical cases, eight cats were subjected to different surgical operations under 'Kemithal' Sodium anaesthesia. The duration of surgical anaesthesia was noted to find out whether or not surgical operation greatly alters the depth as well as the duration of anaesthesia.

The cats were closely observed for five days after recovery from anaesthesia to determine any unusual after-effect of the drug upon the animals. The pulse, respiration and temperature readings were taken daily. After this period, if the experimental animals did not exhibit any abnormal condition, they were either given away or destroyed painlessly.

The same observations were made on the surgical cases, with special emphasis given on the healing of the operative wounds.

therapeutic and toxic doses, was that some of the cats had pale visible mucous membranes. Likewise, as noted with the therapeutic doses, the duration of injection until surgical anaesthesia was produced, was influenced by the weight of the animal, *viz*; heavier cats required longer injection time. This was true with the toxic and lethal doses.

The changes in the animal during the period of surgical anaesthesia with the toxic doses (31 mg. to 32 mg. per pound body weight), were nearly the same as those observed with the therapeutic doses. The only significant changes noted which were absent under the therapeutic doses were: one cat had pale visible mucous membranes, while another showed paleness at first, but later on became congested; no salivation was noted; and the respiration and pulse rates were generally accelerated, while the temperature readings went down. The pulse had a range of 108 to 224 (average, 166) per minute and the respiration rate varied from 4 to 56 with an average of 30 per minute. These are significantly higher than those observed with the therapeutic doses (*loc. cit.*). The temperature readings, on the other hand ranged from 35.0°to 38.6°C. with an average of 36.8°C. Because of the lowering of the body temperatures to some extent, chilling was almost always present among all the cats observed.

The duration of surgical anaesthesia with the toxic doses ranged from 89 to 121 minutes with an average of 100·33. It will be seen in Graph 1 that the stage of anaesthesia with the toxic doses is about 43·33 minutes more than that of the maximum therapeutic dose.

The stage of recovery was ushered in with the gradual reappearance of the reflexes as in the therapeutic doses. At this stage, one cat manifested salivation and excitement was totally absent in all those used in the trials. Except in one cat, which had contracted pupils, all had dilated ones. Respiration was deep and irregular but rapid, although one cat had a shallow, irregular and slow breathing, which became rapid later on. The pulse was fast, strong, and irregular with the exception of one which had a slow and weak pulse. The pulse and respiratory rates had a range of 80 to 200 (average, 140) per minute and 16 to 80 (average, 48) per minute, respectively. The body temperature varied from 35·0° to 37·7°C.

The visible mucosa was either slightly pale or cyanotic. All the cats defecated during this stage, while only one urinated. Two of the cats had stiffening of the body during the recovery stage. Chilling was present until the body temperature returned to normal. The duration of recovery was unusually lengthened in one cat (22 hours), while in the others it varied from 2·4 to 6·5 hours.

The post-experimental stage of the toxic doses presented impressive manifestations of the effect of the over-dosage of the drug upon the animals. Two cats became weak, groggy, dull and had impaired appetite two to three days after the experiments, while their body temperature did not go beyond the normal. Recumbency was the favourite position. Another cat died four days following the day of the experiment. One cat died 13 minutes after the onset of surgical anaesthesia with the toxic dose (31 mg. per pound body weight). It has been observed that the margin of toxicity of this drug in cats is rather narrow.

With the lethal doses (33 mg., 33⅓ mg., and 34 mg., and 35 mg. per pound body weight), it is understood that the animal should die immediately after injection or several minutes thereafter. One cat died 102 minutes after injection, while another injected with the supposedly lethal dose of 34 mg. per lb. body weight exceptionally and surprisingly lived. It was under surgical anaesthesia for 80 minutes or 1·3 hours (Table 1). Death occurring with the lethal doses was brought about by respiratory failure first, the heart beat was very fast just after injection, then gradually became weaker until it finally stopped. As death neared, the pupils dilated to the maximum, the visible mucous membranes became pale and cyanotic, there was defecation and urination, and finally the disappearance of all the body reflexes.

Surgical Cases.—The observations on actual surgical cases are given in Table 2. The operations performed were castration, gastrotomy, splenectomy, nephrectomy, and panhysterectomy. All these operations healed by first intention, with the exception of one which healed by third intention, probably due to poor surgical measures adopted at that time.

The duration of surgical anaesthesia corresponded with those obtained in the experimental group given the therapeutic doses (25 mg. and 30 mg. per pound body weight), although the duration in the former was longer.

It will also be seen in Table 2 that the dosage used varied with the kind of operation performed. Hence, for minor operations, the minimum therapeutic dose of 20 mg. per pound body weight was used and for the major operations, the higher doses were exploited. Since the injection of antibiotics, dextrose-saline solution (to shorten the recovery period), etc. might have possibly affected the physical condition of the animals during the stage of recovery of these cases, the physical changes observed during such time were not recorded. One interesting observation noted, however, was the presence of excitement in one of the surgical patients during the stage of recovery.

TABLE I

The Effect of Lethal Doses of 10 Per Cent 'Kemithal' Sodium Injected Intravenously in 10 Native Cats.

Dosage Used (Mg. Per lb. Body weight)	Cat No.	Sex	Weight (lbs.)	No. of c.c. Given	Length of Time Elapsing From the Onset of Anaesthesia Until Animal Died (mins.)
33 Mg.	1	F	4·40	1·5	6
	2	F	3·30	1·1	19
33⅓ Mg.	1	F	3·96	1·3	13
	2	F	5·50	1·8	7
	3	M	5·50	1·8	7
34 Mg.	1	F	4·84	1·6	Slept 80 mins., Survived
	2	M	5·28	1·8	9
	3	M	5·06	1·7	102
35 Mg.	1	F	6·16	2·1	3
	2	M	4·62	1·6	Immediate

There are idiosyncrasies of cats to many drugs. This, possibly may be the explanation for the unexplained deaths occurring with the therapeutic and toxic doses and for the survival of one out of ten cats under the influence of the lethal doses. In view of these findings, together with the proximity of the minimum lethal dose (33 mg per pound body weight) to the maximum therapeutic dose of 30 mg. per pound body weight, the use of the latter should be avoided as much as possible. It may be said that cats are more sensitive to this drug than dogs.

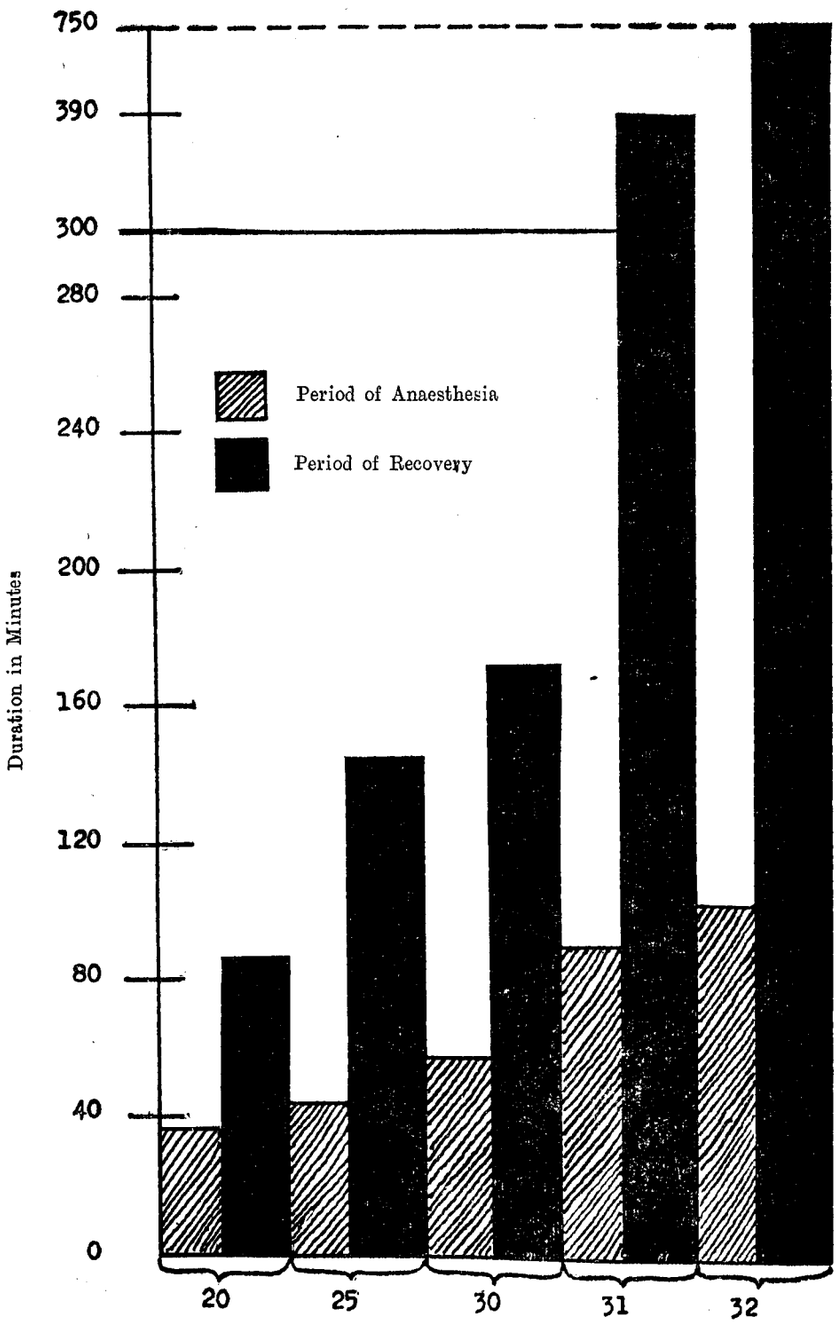
Summary and Conclusions

1. A study of the anaesthetic value in thirty-seven native cats of a non-volatile, short-acting, and descending type of general anaesthetic, 'Kemithal' Sodium, given intravenously in 10 percent aqueous solution, is herein reported.

TABLE II

The Duration of Surgical Anaesthesia in 8 Native Cats Given Various Doses of 10 Per Cent 'Kemithal' Sodium Solution Intravenously Prior to Surgery.

Dose Given (mg. Per lb. body wt.)	Cat No.	Sex	Age (Mos.)	Weight (lbs.)	No. of c.c. Given	Operation performed	Duration of Surgical Anaesthesia (Mins.)	Average Duration of Surgical Anaesthesia (Mins.)
20 mg.	1	M	24	7·10	1·4	Castration	20	18·50
	2	M	19	6·50	1·3	Castration	17	
25 mg.	3	M	12	6·38	1·6	Gastrotomy & splénec-tomy	77	62·25
	4	M	18	7·70	1·9	Gastrotomy	49	
	5	F	18	5·50	1·4	Nephrec-tomy	65	
	6	F	20	5·06	1·2	Panhysterec-tomy	58	
30 mg.	7	M	28	9·46	2·8	Nephrec-tomy	76	72·50
	8	F	12	7·51	2·3	Panhysterec-tomy	69	



Graph 1

The average duration of surgical anaesthesia and recovery recorded in 19 native cats given various doses, intravenously, of 10 per cent 'Kemithal' sodium solution.

2. The average period of induction was rapid, easy and generally without excitement, ranging approximately from 3 to 15 seconds.

3. The average length of surgical anaesthesia varied with the therapeutic doses used (20 mg. to 30 mg. per pound body weight) from 15 to 72 minutes. The physical changes noted were slight respiratory depression, contraction of the pupils, complete relaxation of the voluntary muscles of the limbs and abdomen, congestion of the visible mucous membranes, tachycardia and occasional slight ptyalism.

4. On the average, the stage of recovery ranged from approximately 37 to 269 minutes with the therapeutic doses. Consciousness returned quietly and rapidly with a few exceptions.

5. 'Kemithal' Sodium in 10 per cent aqueous solution given intravenously has a very narrow margin of safety in native cats.

6. For minor surgical operations, the minimum therapeutic dose of 20 mg. per pound body weight is useful and for major operations, the 25 mg. per pound body weight dose is the one of choice.

7. Doses of from 31 mg. to 32 mg. per pound body weight were found to be toxic.

8. The minimum lethal dose is 33 mg. per pound body weight.

Acknowledgments

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THE EFFECT OF CLEARING AGENTS ON SPERM MORPHOLOGY

By

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Mercier and Salisbury (1947) reported that clearing of bull semen smears for 5 minutes in 1 percent aqueous chloramine was responsible for producing most of the tail-less heads and that normally formed tail-less heads may be artefacts and consequently should be included among the true abnormals only when the staining procedures do not produce them. They also found that spermatozoa in fresh semen were more fragile and subject to breakage during the clearing process than stored Spermatozoa. Emik and Sidwell (1949) conducted a careful inquiry into the causes of tail-less sperm in ram semen and came to the conclusion that smearing created no more tail-less sperm than diluting, if good quality semen was used but if poor quality semen was used about 6 per cent of additional tail-less sperm were produced by smearing when 50 per cent were formed in the dilution. The percentage of tail-less sperm, as measured in the haemocytometer was the same, whether chlorazene or phosphate buffer was used as the diluent. They were also of the view that the increased numbers of tail-less sperm noted by Mercier and Salisbury (1947) were probably due to the physical effects of clearing and staining, rather than any specific effects of chlorazene on the necks of the sperm. Rao and Berry (1950) employed a saturated aqueous solution of chlorazene as a diluent for determining the sperm concentration and reported that this procedure did not increase the number of tail-less sperm.

It was, therefore, felt necessary to conduct a series of experiments to determine the effect of clearing agents on sperm morphology using also some of the clearing agents recently reported (Rao, C. K. 1956.)

Materials and Methods

The semen of the bull and the buffalo bull was used in this study. Both fresh as well as stored semen were used for making the smears. Simple air-drying was used to fix semen smears. Special precautions were taken to see that no damage was done to sperm structure during the clearing process.

A number of experiments were conducted to determine the effect of clearing agents on sperm morphology and details of procedure are furnished under each experiment separately. Just one hundred sperm well distributed over the smear were counted to ascertain the proportion of tail-less sperm. The abnormal sperm were divided into only two classes for the sake of simplicity *viz.* tail-less sperm and other abnormals.

Results

Effect of clearing agents on sperm morphology.—The following three experiments were conducted to ascertain what effect, if any, the clearing agents have on sperm morphology.

Experiment No. I.—A number of smears of bull semen were made, special precautions being taken to avoid damage to sperm structure. They were then cleared for periods of ½, 1, and 5 minutes in each of the following three clearing agents *viz.* saturated aqueous chlorazene solution, 0·1 percent aqueous solution of sodium hydroxide and 1 per cent aqueous solution of sodium carbonate. After clearing and washing in running tap water, the smears were stained for 15 seconds in carbol-crystal violet, washed, dried and examined at a magnification of 800. Control smears from each sample were stained uncleared for ½ minute in 1 per cent aqueous erythrosin B.

All smears from each sample required for each experiment were prepared at the same time using the same technique with the object of reducing differences due to this cause to the absolute minimum. Only thoroughly clean and new slides with perfect smooth edges were used to avoid damage to sperm in the process of smearing.

The results of this study are presented in the following table :—

Table I

Effect of clearing on the proportion of tail-less and other abnormal sperm.

Clearing agent	No. of semen samples	Period of clearing					
		½ minute		1 minute		5 minutes	
		Tail-less sperm Mean %	Other abnormals Mean %	Tail-less sperm Mean %	Other abnormals Mean %	Tail-less sperm Mean %	Other abnormals Mean %
1. Saturated aq. chlorazene	10	1·7	3·3	1·5	3·3	1·5	3·3
2. 0·1 per cent aq. sodium hydroxide	,,	1·3	3·7	1·2	3·7	1·3	3·7
3. 1·0 per cent aq. sod. carbonate	,,	1·5	3·2	1·3	3·3	1·3	3·5
4. Uncleared smears.	,,	1·5	3·5	—	—	—	—

From the data presented above, it is evident that the process of clearing does not increase the number of tail-less sperm or other abnormal sperm in smears subjected to this process upto a period of 5 minutes clearing. There were also no marked differences in the proportion of tail-less and other abnormal sperm in smears cleared by different chemical agents. The duration of the clearing process also did not materially affect the number of tail-less and other abnormal sperm, when the time factor ranged from ½ to 5 minutes.

From the above considerations, it is apparent that the clearing process is in no way harmful to sperm structure. Clearing periods exceeding 5 minutes were not tried, as this was unnecessary in view of the excellent clearing results that are obtained at much shorter exposures (Rao, 1956).

Experiment No. II.—In a further study to determine the effect of clearing, on the proportion of tail-less and other abnormal sperm, to reduce the error in the smears still further. one-half of each smear was cleared with one of the clearing agents mentioned earlier for ½ minute followed by staining with carbol-fuchsin for 15 seconds, washed, dried and examined. The other uncleared half of the smear (control) was stained for ½ minute in 1 per cent aqueous aniline blue w. s. for 15 seconds. The proportion of abnormal sperm in each half of the smear was then determined separately. The results of this study are presented in the following table :—

TABLE II

Effect of clearing on the proportion of tail-less and other abnormal sperm.

Clearing agent	No. of samples	Cleared portion		Uncleared portion	
		Tail-less sperm Mean %	Other abnormals Mean %	—	—
1. Saturated aq. chlorazene	10	1·3	2·3	1·2	2·4
2. 0·1 per cent aq. sod. hydroxide	10	1·5	2·3	1·2	2·4
3. 1·0 per cent aq. sod. carbonate	10	1·4	2·5	1·3	2·3

The data presented above also indicate that clearing of smears is relatively unimportant as a causative factor for inducing tail-less sperm. Similarly, even the proportion of abnormal sperm other than the tail-less ones remained relatively constant in cleared and control smears. The assumption, therefore, that abnormal sperm remain relatively more adherent to the slides than the normal sperm (Salisbury & Mercier, 1947) is not substanstiated by the results of this investigation.

Experiment No. III.—In a further effort to determine the role of clearing agents in the causation of tail-less sperm in semen smears, the following experiment was conducted. A couple of drops of semen were mixed with each of the clearing agents in a small test tube and allowed to remain at room temperature (about 90°F) for one hour. Smears were made from the semen-stain mixture at intervals of 10 minutes upto one hour after mixing. Control smears were made from plain semen. All smears were stained in 1 per cent aqueous erythrosin B for ½ minute. Saturated aqueous chlorazene, saturated aqueous chloramine and 0·1 per cent aqueous sodium hydroxide were the clearing agents used in this study. In the study of sperm morphology in these preparations only two classes of sperm were recognised—tail-less sperm and those with tails to determine whether the process of mixing with the clearing agents has loosened the tails from the heads of sperm. The results of this study are presented in the following table :—

TABLE III

Effect of clearing agents on the proportion of tail-less sperm.

Clearing agent	No. of semen samples	Mean per cent tail-less sperm					
		Exposure to clearing agent in minutes					
		10	20	30	40	50	60
1. Uncleared smears	10	1·0	—	—	—	—	—
2. Saturated aq. (chlorazene)	10	0·7	0·6	0·6	0·7	0·8	0·9
3. „ „ chloramine	10	0·9	0·9	0·7	0·9	0·9	1·0
4. 0·1 per cent aq. sod. hydroxide	10	0·9	0·8	1·0	0·8	0·7	1·0

From the data presented in the above table it is abundantly clear that even when mixed directly with the semen and the sperm exposed to the clearing agent for as long as one hour no increase in the proportion of tail-less sperm was brought about. It therefore appears reasonable to assume that the chances of the clearing agent causing separation of heads of sperm from tails when semen smears are subjected to the clearing process, are very remote, particularly in view of the very short period (less than 1 minute) for which the clearing agent remains in contact with the smear.

Effect of clearing on smears of fresh and stored semen.—Mercier and Salisburry (1947) reported that sperm in fresh semen were more fragile and subject to breakage during the clearing process than sperm in stored semen. To determine whether the physiological state

of the sperm has any effect on the incidence of tail-less sperm in cleared smears, the following experiment was conducted.

Smears of bull semen were prepared soon after collection, cleared for ½ minute in saturated aqueous chlorazene, washed and stained for 15 seconds in carbol fuchsin. A portion of each sample was stored at room temperature of about 90° F. and sulphanilamide added to this at the rate of 300 mg. per 100 c.c. to inhibit bacterial growth and prevent putrefaction of semen. After four days of storage at room temperature by which time all the sperm were dead, smears were prepared from each sample, taking full precautions to avoid damage to sperm structure, cleared and stained as mentioned earlier and examined for the proportion of tail-less sperm. The abnormal sperm in semen smears were classified only into two groups, tail-less sperm and those with other abnormalities for the purpose of this experiment. The results of this study are presented in the following table :—

TABLE IV

Effect of clearing on smears of fresh and stored semen.

No. of semen samples	Fresh semen		Stored semen	
	Tail-less sperm %	Other abnormals %	Tail-less sperm %	Other abnormals %
10	1	4·8	0·9	4·6

The data presented above indicate that the proportion of tail-less sperm and other abnormal sperm remains at about the same level in cleared smears prepared either from fresh semen or stored semen, thereby indicating that sperm in stored semen are no more resistant to the clearing process or the smearing process than those in fresh semen. These findings are at variance with those of Mercier and Salisbury (1947) who found that smears of bull semen stored for four days gave a lower percentage of tail-less sperm after clearing with 1 per cent aqueous chlorazene for 5 minutes than smears of the same sample prepared fresh after collection.

Summary

Studies were made on the effect of the clearing process on the incidence of tail-less sperm in smears of both fresh and stored semen.

Clearing of semen smears for periods as long as 5 minutes did not increase the number of tail-less sperm or other types of abnormal sperm. When smears were cleared for the periods specified there was not any danger of too many sperm being washed off from the smear.

Mixing of semen with the clearing agents and keeping the sperm in contact with the latter for as long as one hour did not increase the proportion of tail-less sperm.

Dead sperm were found to be no more resistant to the smearing and clearing process than live sperm.

From the studies made it appears that the smearing process is much more important in producing tail-less sperm than the clearing process and utmost care should therefore be taken to see that the materials and techniques employed in preparing semen smears are perfect.

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AN EXPERIMENTAL STUDY ON THE VIRUS OF BUFFALO-POX

BY

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Introduction

Pox is one of the ancient diseases known to occur among men and animals from very early times. Cow-pox was of a frequent occurrence till the middle of the last centuary, the infection being contracted from cases of human variola. But after the historic discovery of a potent vaccine against small-pox by Jenner in 1792, the occurrence of cow-pox as an epidemic has become almost absent, excepting sporadic cases infected through vaccinated persons.

Opinion seems to be divided as regards the classification of the cow-pox virus. While Gerlach, Bolinger and Gins quoted by Hutyra and Marek (1946) seem to think that cow-pox as a primary disease is doubtful, Rhodes and Rooyen (1953) are of the opinion that cow-pox has a separate identity though it very closely resembles vaccinia. Whatever might be the contradictions, the fact remains, that cows do contract the infection from human variola and the vaccinia lymph obtained from cows gives protection against human small-pox. Hence there is every reason to believe that in general, variola vaccinia is only an adaptation of the

variola major of human origin causing small-pox. It is very interesting to note that a virus that produces very severe generalised lesions in the human, when it attacks cows, becomes purely localised being confined mostly to the udder and teat. Hence even in widespread outbreaks among cows, cases have not been recorded in the form of a generalised affection in other parts of the body. Workers on the subject have all dealt with mostly about cow-pox, literature on buffalo pox being rather rare. Creste and Sabastini quoted by Hutyra and Marek (1946), seem to be the only workers who describe an outbreak of buffalo-pox in Italy. In India, the authors of this paper, have not so as far come across with any literature published on buffalo-pox.

During 1952, the authors' attention was drawn to an outbreak of buffalo-pox which was occurring in an epidemic form in the Guntur district of Andhra state. It was reported that the epidemic was coming like a wave from one end of the district to the other. The disease was purely confined to buffaloes even though white cattle were in close contact with them. The infection rate was said to be as high as 65 to 70%. The lesions were found around nostrils, eyes, ears, abdomen, udder, teat, thigh, axilla etc. The pustules were of the size of a pea containing yellowish fluid. When the pustules coalesced, extensive sores were formed covering large areas of the body. When the udder was badly involved, animal developed mastitis and in the case of ear otitis.

Since it was considered to be a very good opportunity to study the virus of buffalo-pox in its varied aspects, materials were obtained from natural cases both in the dried state and in 50% glycerine and the following experiments were carried out.

Experimental Methods

1. Transmission experiments on buffaloes with materials obtained from the field, study of reactions and collection of virus.

2. Transmission experiments on buffalo, cattle, sheep and goats with the materials obtained from the above experimental animal.

3 & 4. Studying the relationship between the virus of buffalo-pox and that of vaccinia by cross immunity tests with the idea of finding out whether the vaccinia vaccine can give protection against buffalo-pox.

Part I

Transmission experiments on buffaloes with materials obtained from the field-study of reactions and collection of virus.

The field virus of buffalo pox received from the field from the above outbreak at Nedubrole was emulsified in glycerine. Two buffalo

bull calves were scarified both in the region of the right side of the abdomen and inside of the left ear. The abdominal region was shaved the previous day and after being thoroughly washed with soap and water and dried, sterile glycerine was applied to the abdominal area and a covering bandage was put on. The next day, i.e., on 29-4-52, the area was cleaned with cotton wool, 6 to 7 very thin linear incisions were made both vertical and horizontal. The glycerine emulsion containing the virus was applied with a sterile brush. Simultaneously the virus was applied to the inside of the left ear by two small vertical and horizontal incisions. The following reactions were noticed.

1. *Buffalo bull No. 11.* was scarified on 29-4-52 as per technique given above. On 1-5-52, the skin in the abdominal region of scarification was found inflamed and thickened. The next day with the increase in inflammation and thickening, a number of eruptions were noticed. By the evening, the eruptions have become vesicular and pustular and some of them have even become coalesced and matted together; by 4-5-52 the pustules have become completely dried up and scabs were formed. The animal recorded a maximum temperature of 104·8°F on 4-5-55. The scabs were removed and stored partly in glycerine and partly in the dried state. No lesions were noticed in the ear. Throughout the period of the experiment, the animal was feeding normally.

2. *Buffalo bull No. 12* was scarified on 29-4-52 as above. On 2-5-52 the skin on the region of the abdomen was lightly inflamed and thickened and two vesicles were seen. On 3-5-52, a number of vesicles had developed which have become pustular and coalesced by the evening. The animal also had developed two or three pustules in the ear. The reaction observed in this animal was more severe than in animal No. 11. In the first animal the pustules dried up in four days, but in the second animal, the lesions were not completely dried up even after 7 days. The pustules were more yellowish and sticky and bigger in size. The dried scabs were collected and stored up in the refrigerator.

Findings:—It was found by this experiment that the field material was fully viable and produced severe lesions in buffaloes.

Part II

Transmission experiments on buffaloes, cattle, sheep and goats with the materials obtained from the above experimental animals.

The dried scabs collected from buffalo bulls 11 and 12 were emulsified in 50% glycerine and the emulsion was treated with 50,000 units of penicillin to eliminate any bacterial contamination. The ratio of the emulsion was 1 part of the dried scab to 10 parts of glycerine. In all 2 buffaloes, 2 white cattle, 2 sheep and 2 goats

were used. The same precautions and technique were adopted as in the case of buffaloes 11 and 12.

1. *Buffalo No. 40* was scarified on 23-6-52 with the above material on the abdomen and ear. The animal exhibited erythema on 24-6-52 and distinct vesicles on 28-6-52 both in the abdomen and the ear. It had mucopurulent discharge from both the eyes. The scabs started drying up from 30-6-52 and by 4-7-52 they were fully dried up and scabs were collected. The maximum temperature of 101·6°F was recorded on 29-6-52.

2. *Buffalo No. 41* This animal also was scarified on 23-6-52 both in the ear and abdomen. Erythema was noticed the next day and minute vesicles were seen on 27-6-52 which turned into distinct pustules on 28-6-52. This animal also had mucopurulent discharge from the eyes. The number of pustules were more numerous than in buffalo No. 40. Some of them showed slight umbelication and contained an yellowish white fluid. The inguinal lymphatic gland of the scarified side was enlarged. On 1-7-52, the lesions were much bigger and there was distinct umbelication with a white zone all round with a brownish centre giving the appearance of a fungus. Thereafter the lesions started drying up and scabs were collected on 4-7-52.

3. *Bull calf (cattle) No. 42*—This was scarified on 23-6-52 in the abdomen and the ear. on 26-6-52, the erythema and thickening were noticed in the abdominal region. The next day, a number of small vesicles appeared. On 28-6-52, the vesicles increased in size with intense dermatitis of the affected area. Some of the vesicles were umbelicated and some coalesced. On 3-7-52 almost all the vesicles were dried up and scabs were collected.

No lesions developed in the ear in this animal.

4. *Bull (cattle) No. 43.*—This was scarified on 23-6-52 in the abdomen and the ear. Till 29-6-52, no reaction was noticed. On 28-6-52, a few vesicles were seen. On 29-6-52 slight thickening was noticed in the area without much erythema. The number of vesicles present was less than those found in bull No. 42 and were smaller in size. They had a tendency to dry up much quickly. On 1-7-52, the lesions were completely dried up and were removed on 4-7-52.

5. *Sheep No. 44.*—This was scarified both in the ear and abdomen on 23-6-52. On 28-6-52, minute nodules of the size of a mustard made their appearance both in the abdomen and ear. The next day the nodules became a little bigger, and thereafter they started drying up forming scabs. No vesicular stage was noticed. The scabs were completely dried up by 4-7-52, and were removed. The sheep that was

An Experimental Study on the Virus of Buffalo-pox

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Fig. 2.
Lesions produced in buffalo No. 41 infected with the materials collected from buffaloes No. 11 and 12.

Fig. 4.
Lesions produced in bull No. 77 which was infected with the vaccinia virus.

Fig. 1.
Lesions produced in buffalo No. 12 infected with the original material of buffalo-pox received from the outbreak.

Fig. 3.
Lesions produced in bull No. 42 infected with the materials collected from buffalo No. 12.

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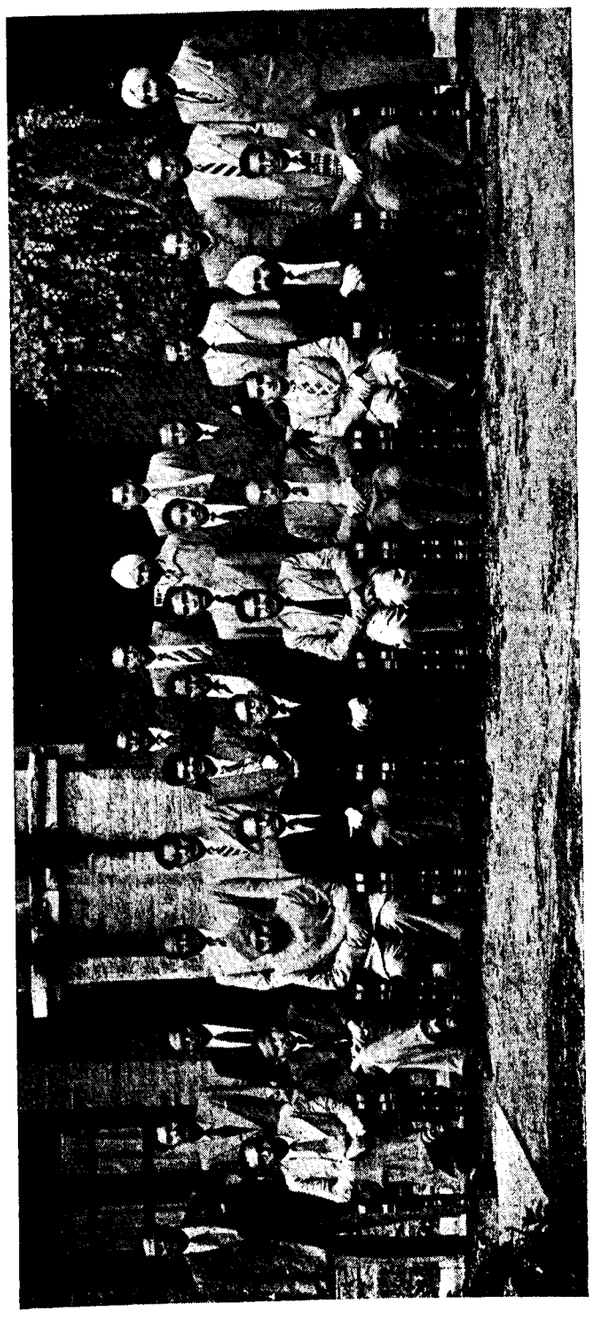

Sitting :—*Left to Right* : Sarvasri, S. S. Sen, S. S. Negi, Gajeder Singh, P. R. Nilakanthan, G. L. Sharma, M. R. Dhanda, *(H.O. Path. & Bact.)*, J. M. Lall, M. M. Sethi, B. M. Thakral.

Standing :—*1st Row* : K. M. Bose *(W. Bengal)*, S. N. Guhathkurta *(W. Bengal)*, D. D. Sharma *(Kashmir)*, S. R. Ghaligi *(Bombay)*, K. P. Shrivastava *(U.P.)*, O. P. Gupta *(U.P.)*, J. V. Anjaria *(Saurashtra)*, S. R. Kulkarni *(Bombay)*, A. K. Verma *(M.P.)*, P. D. Malik *(Punjab)*, D. V. Subramaniam *(Andhra)*, O. Hanumantha Rao *(Andhra)*, A. S. Grewal *(Himachalpradesh)*.

2nd Row : C. M. S. Tirkey *(Bihar)*, A. M. Shrivastava *(M.P.)*, Kulwant Singh *(Kashmir)*, T. V. K. Rao *(Andhra)*.

alright till 12-6-52, suddenly died the same day and post-mortem revealed no lesions of pox.

6. *Sheep No. 45.*—This was scarified as above on 23-6-52. Lesions were similar to those of Sheep No. 44 and scabs were collected on 4-7-52.

7. *Goat No. 46.*—This was scarified as above on 23-6-52. On 28-6-52, very minute eruptions were noticed in the abdomen and ear, and these became very distinct the next day. On 1-7-52, some of the eruptions in the abdominal region formed into vesicles finally turning into pustules. On 4-7-52, the lesions were completely dried up and were removed as scabs.

8. *Goat No. 47.*—This was scarified as above on 23-6-52. No lesions developed till 29-6-52 on which date the animal died. Post-mortem did not reveal any internal lesions of pox.

Findings :—1. The buffalo-pox virus obtained from the experimental animals was able to produce in buffaloes the same severe lesions as those noticed in the case of the field material.

2. The material was equally infective to cattle though the lesions produced in those animals were slightly milder than those in buffaloes.

3. The lesions observed in sheep and goats were far milder than those noticed in the above two species.

Part III

Cross Immunity Tests

Having studied the infectivity of buffalo-pox virus to buffaloes, white cattle, sheep and goats, the experiment was further continued to find out the relationship between this virus and vaccinia virus. It was decided to test if an attack of buffalo-pox can give protection against vaccinia virus. All the animals, buffaloes, cattle, sheep and goats that were originally infected with buffalo-pox virus were now challenged with the vaccinia virus obtained from the King Institute, Guindy. In every species so challenged a control was kept to check the results.

Buffaloes Numbers 40 and 41 which had reacted severely to buffalo-pox neither developed any local lesion nor thermal reaction on a challenged dose of vaccinia virus. In the control animal (buffalo) No. 74 also no perceptible lesions were seen excepting slight thickening.

In white cattle, bull Numbers 42 and 43 which were already subjected to buffalo-pox infection and now challenged with vaccinia virus,

there was absolutely no local reaction of any kind. The control bull No. 77 reacted severely and developed typical lesions showing all the stages. The lymphatic gland of the affected region was also inflamed and enlarged. The lesions subsequently dried up and scabs were collected. Goat No. 46 that had already been infected with buffalo-pox, when challenged with vaccinia virus, did not show any reaction either local or thermal, whereas in control goat No. 79, typical lesions (eruptions and vesicles) were noticed on the 4th day of scarification.

Sheep No. 45 (buffalo-pox infected animal) when challenged with vaccinia virus showed no lesions. Whereas, control sheep Numbers 81 and 82 developed typical lesions.

Findings:—1. An attack of buffalo-pox appears to give absolute immunity against vaccinia virus for all the four species of animals, *viz.*, buffalo, cattle, sheep and goats.

2. The failure of the control buffalo to react against vaccinia virus is probably attributable to the fact that the animal had already been used for Rinderpest experiments.

Part IV

Part III of the experiment has clearly proved that the buffalo-pox virus gives absolute protection against vaccinia virus in buffaloes, white cattle, sheep and goats. The lesions set up by the vaccinia virus in white cattle were typical showing all the four stages. In the case of sheep and goats vaccinia virus produced typical lesions showing the vesicular stage but the lesions were minute ones. No lesions were seen in the buffaloes.

In this part of the experiment it was decided to find out if all these four species of animals protected first with vaccinia virus could withstand a subsequent infection of buffalo-pox virus.

Buffalo No. 74 which was originally scarified with the vaccinia virus on 29–7–52, and which showed no reaction was now challenged with the buffalo-pox virus by abdominal scarification on 22–8–52. Excepting slight reddening at the site of this scarification which was noticed on 24–8–52, nothing more was seen.

Bull No. 77 which was originally scarified with the vaccina virus on 29–7–52, and which reacted and recovered was now challenged on 22–8–52 with the buffalo-pox virus by abdominal scarification. There was absolutely no reaction.

Sheep numbers 81 and 82 and goat number 79 which were originally scarified with the vaccinia virus on 30–7–52 and which reacted

and recovered was now challenged on 22–8–52 with the buffalo-pox virus by abdominal scarification. Absolutely no reactions were noticed in these animals.

Since the lesions produced by the vaccinia virus in buffalo No. 74 were very insignificant, the experiment was further repeated. Two buffaloes 92 and 93 were scarified in the abdomen with the vaccinia virus. In these two buffaloes also no appreciable lesions were noticed and when they were challenged with the virulent buffalo-pox virus on 6–9–52, the animal did not take up the infection.

Findings :—1. Vaccinia virus is able to give absolute protection against buffalo-pox virus in all the four species of animals, viz, buffalo, white cattle, sheep and goats.

2. Even though vaccinia virus produces no lesions in buffaloes, these animals were able to withstand a challenge of the buffaloe-pox virus.

The buffalo-pox material with which the above experiments were conducted was handed over to the Director, King Institute, Guindy for necessary tests and reports. Transmission experiments were conducted at the King Institute, Guindy on cattle, rabbits and monkeys. The report received from the Director, King Institute states that the buffalo-pox virus is immunologically identical with that of vaccinia virus.

Summary of Findings

1. The buffalo-pox virus obtained from the field produced in buffaloes and white cattle typical lesions of pox. The same was more severe in buffaloes.

2. The lesions produced in sheep and goats were far milder.

3. Buffalo-pox virus gives absolute protection against vaccinia virus in buffaloes, cattle, sheep and goats.

4. Vaccinia virus gives absolute protection against buffalo-pox virus in buffaloes, cattle, sheep and goats.

5. The lesions produded by the vaccinia virus in cattle, sheep and goats were typical.

6. Vaccinia virus produces no lesions in buffaloes.

Conclusions

From the above experiments, it could be concluded that the virus of buffalo-pox seems to be closely allied to vaccinia virus since one gives protection against the other.

Acknowledgment

We are very grateful to the Director, King Institute, Guindy, and his staff for rendering valuable assistance and advice during the course of this work. We are also very much indebted for the work which was conducted at the King Institute, Guindy, with the above material and communication of the results. Our thanks are due to Dr. G. G. Alton, F.A.O., Expert, for kindly taking the photographs.

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LOSSES IN ENSILAGE AND COMPOSITION OF NAPIER GRASS MOLASSED SALT SILAGE

By

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Leaves of Napier Grass (*Pennisetum Purpureum*) cut in 2" pieces, at 4—5' height in 55 days growth, were ensiled in Laboratory silo with preservatives 2% sugar (or molasses) and 0·8% salt on fresh grass weight as reported previously[3]. After 155 days of storage, the silage and effluent were analysed and CO_2 evolved was estimated. The losses in ensilage, the acids and bases produced and the composition of silage are given in Tables I, II, and III.

Table I

Losses in Ensilage as % of Dry Matter Ensiled.
(Including Preservative).

True D.M. Loss*	Volatile Acids & Bases (Acetic acid Ext.		CO_2 Evolved	Other Gases Loss	D.M. Loss in Effluent	Water Loss in Gases	Apparent D.M. Loss**
	Silage	Effit					
8·7	5·6	0·7	0·6	3·5	2·8	4·5	15·0

* — Correcting for volatile acids & bases present in silage.
** — Including the volatile acids & bases lost in drying silage.

Table II

Acids produced for 100 grams dry matter ensiled.
(Including Preservative).

	Total Acids (free & combined) = 0·1 N, NaOH ml.	Volatile Org. acids = 0·1 N, NaOH ml.	Non-volatile Org. acids = 0·1 N, NaOH ml.	Amino acids = 0·1 N, HCl. ml.	Volatile Bases = 0·1 N, HCl. ml.
Silage	1505·8	606·8	545·0	349·5	329·8
Effluent	160·0	103·7	26·0	30·2	17·5
Total	1665·8	710·5	571·0	379·7	347·3

Table III

Percentage Dry Matter Composition of Grass and Silage.

Fodder	Moisture (Fresh Basis)	Crude Protein (N x 6·25)	Ether Extractive	Crude Fibre	Nitrogen Free Extractive	Total Ash	Silica	Ca.	P.
Grass (+)	78·7	12·56	4·14	28·31	45·12	9·87	2·85	0·37	0·27
Silage (++)	82·0	12·59	8·66	31·01	34·44	13·30	4·59	0·65	0·28

\+ .— Dried at 105°C.
++ .— „ „ 100°C.

The pH. of olive green fruity silage was 4·4, while that of the effluent was 4·2. The maximum and minimum temperatures in the silo were 31·5°C., and 24·0°C., while the outside maximum and minimum were 35·5°C. and 17·4°C., during the ensiling period of 155 days.

The low loss of true dry matter, the low evolution of CO_2 also reported before by us[3], the optimum pH., desirable smell and colour of the silage show that ensiling cut Napier grass with 2% sugar and 0·8% salt gives the best silage with minimum loss of nutrients under tropical conditions of our experiment. There is no loss of crude protein in the silage produced. The percentages of ash, fibre and fat increase during ensiling due to the loss of carbohydrates or nitrogen free extract, which is also small and also partly due to the minerals in the preservatives added. Their increased values agree with similar results for other good silages made by different methods and reported by other workers.[2, 4].

The absolute dry matter loss measures the true loss in ensilage which is accompanied by the rise of useful nutrients, the volatile and

non-volatile acids in the silage, which are determined for correctly assessing the real nutrient loss. The moisture contents of fresh grass and silage are about the same and their compositions do not differ much except in total ash, corbohydrates and fat. The changes in composition of silage are fat +4·52, crude fibre +2·7, total ash +3·43 and Nitrogen free extractive –10·68. The total increase in 3 nutrients +10·65 equals the decrease –10·68 in the carbohydrates in the silage. The composition of Napier grass leaves at the same height of growth reported by Chatterjee *et al.* compares well with our results except for crude protein which is higher in our sample probably due to the young stage of growth as the age of growth was not mentioned by these authors[1] and also to other factors in soil, fertilizer and climate.

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General Articles

ANEURYSM OF THE MIDDLE UTERINE ARTERY IN BUFFALOES

By

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Aneurysm (Arterial dilatation) results from resistance of the vessel wall being reduced by previous arteriopathy or arteritis. Blood pressure may enhance the condition and may cause partial laceration of the vascular wall and consequent reduction of its power of resistance.

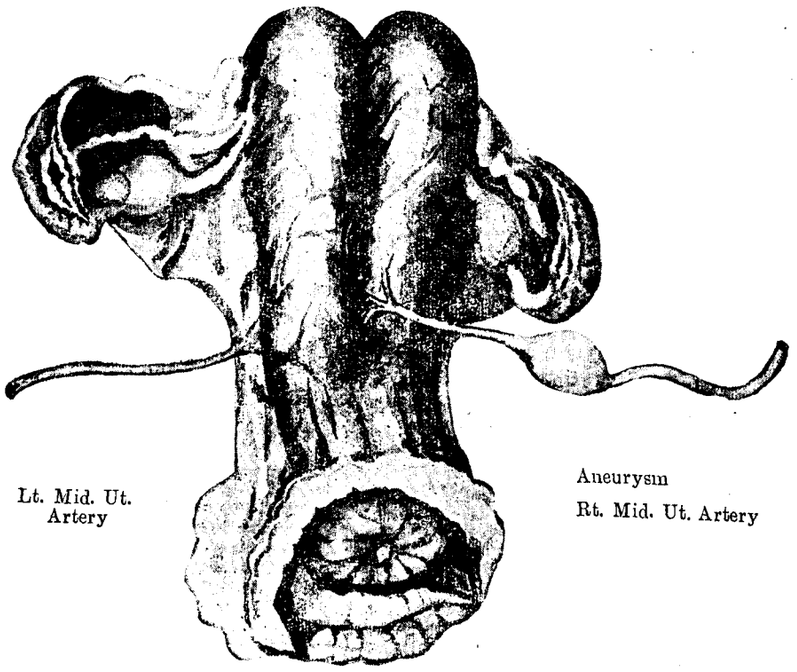
Aneurysm of various vessels in animals has been recorded so far by a number of observers. Tombari and Palat have observed its

frequency in horses exposed to strenuous exertion. Labat and Cadeac (1884) have recorded saccular aneurysm of the size of a man's head in horses. Barrier (1894) has observed in the dog one as large as a turkey's egg. Reimers found aneurysm in the sciatic artery of a cow. Cadiot found aneurysm of the coronary arteries in an ass, and Piot Bey (1905) observed this in three cattle in all of which sudden death occurred. Steinmeier observed aneurysm in carotid artery. Aneurysm of the brachio-cephalic artery was found by Joest in a dog, of the crural artery by Querippel, of the arteria communis digitorum by Starube and in a branch of this by Vogt; of the pharyngeal artery by Blaise in a 15 year old horse with oedema and ulceration of the head and neck, swelling of the tongue and gums, salivation, pharyngitis and its eventual rupture into the pharynx. Snikowa reported aneurysm in a horse in which asphyxia was caused by its pressure on the trachea. Vogel observed aneurysm of the facial artery in a cow, Moquet observed it in the cervical artery in a horse and Ravenal found it in the brachial artery in the hen. Nocard found in a young dog an aortic aneurysm, together with dilatation of the pulmonary artery and Moquet found aneurysm of the same artery in a horse. Chardin observed aneurysm of the portal vein weighing 14 Kg. in a horse. Vennerholm found aneurysm of the jugular vein in a horse. Dupas observed varicose dilatations of the mesenteric veins and Frohner and Bambacher observed dilatation of the external thoracic vein. Piet Bey (1905) reported an arterio-veinous aneurysm in the tail of an ox. In a case observed by Hieronymi in a horse with an angioma of the circumflex scaplae artery, an incompressible pulsating swelling with a systolic thrill was present which emitted an intermittent flow of blood after exploratory puncture. Tombari (1882) observed a blowing murmer over a pulsating swelling in the sacral region. Schmidt (1885) observed a murmer synchronous with the heart beat over an aneurysm of the first part of the posterior aorta.

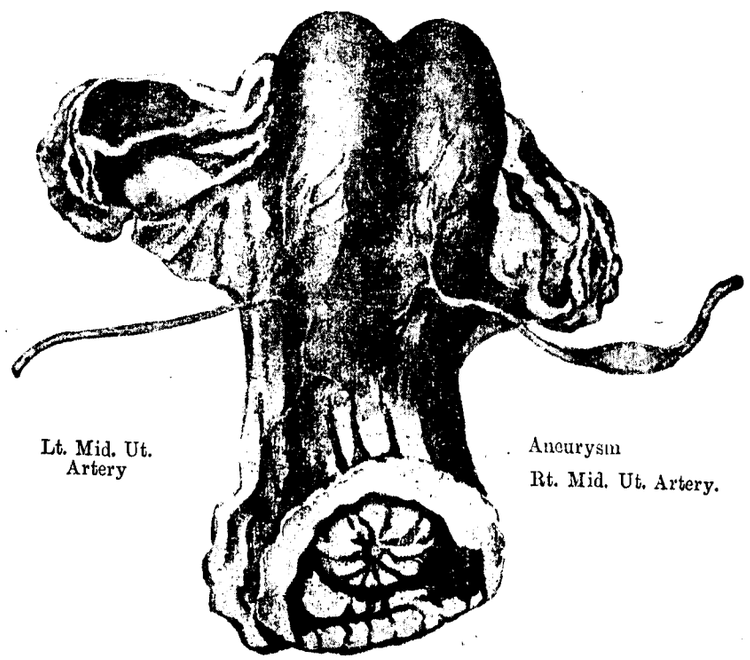
Aneurysms of other arteries are less common, apart from those caused by worms (*S. vulgaris*) in the anterior mesenteric arteries in horses. Aneurysmal dilatations have been recorded by various observers in the coeliac, posterior mesenteric, hepatic and other branches of aorta.

From the records available, it is observed that aneurysm of the middle uterine artery has not been recorded so far by any observer. This was observed recently in two Murrah she-buffaloes and hence it is considered necessary to place these observations on record for guidance of Veterinarians, particularly those engaged in Artificial Insemination and Sterility work.

Genitalia of the buffalo showing the site of aneurysm



Case No. I



Case No. II

The middle uterine artery is of special interest to the clinicians since it serves as an aid to the diagnosis of pregnancy. The artery of the gravid horn becomes enlarged and has a peculiar pulsation (Fremitus) which can be recognised by palpation per rectum. As the period of gestation advances the artery changes its direction in conformity with the forword extension of the gravid uterus.

Details of the cases

Case No. 1:—

Name of the owner	...	Mr. Ibrahim Gulam Rasool.
Place	...	Unit No. 6, Government Milk Colony, Aarey.
Species	...	She-Buffalo No. V-893.
Breed	...	Murrah
Age	...	About 10 years.
Body weight	...	About 1300 lbs.

History:—No particular history. The buffalo was purchased by the owner in 1955. She was presented for examination with a report that she had calved last in March 1955 and had not come on heat since then.

Diagnosis:—On rectal palpation, the genitalia was found to be intrapelvic and normal. During the efforts to palpate the right ovary when fingers were slided to the right side, a cylindrical firm structure measuring about 1½" on long axis and 3/4" in width could be felt. The structure was more or less that of the size of an ovary having a growing follicle or a cyst at one end and thus elongated in the form. The structrue was about 4" to 5" posterior and parallel to the right ovary and had it not been for careful examination, one would have easily mistaken it for an elongated cystic ovary. On careful palpation, it was found that the structure had well defined, firm walls and was cylindrical in form. On pressure, it revealed that it was a well defined dilatation of an artery which was pulsating. The size was reducible according to pressure and assumed its normal form after realease of the pressure. The calibre of the blood vessel at either end of the cylindrical aneurysm was wider and thicker as compared to the normal vessel on the left side. The blood vessel having been traced further to ascertain its identity, it was found that it was the middle uterine artery. (For reference of the readers it may be stated here that the middle uterine artery arises by a common trunk with the umbilical artery and is very large. It descends on the lateral pelvic wall, a short distance behind the external iliac and reaches the dorsolateral surface of the uterus just in front of the body. It is distributed chiefly to the cornua of the uterus and

compensates for the small size of the utero ovarian artery). The aneurysm was located at a distance of 4″-6″ from the right cornua and the vessel could be traced clearly to the dorso-lateral surface of the uterus, just in front of the body. The aneurysm could clearly be felt with regular pulsation. Though the walls could be felt more or less firmer throughout, on delicate palpation one could feel that in places the structure was soft to the touch.

Case No. 2

Name of the owner	...	Shri Issap Mahomed Patel,
Place	...	Unit No. 20, Government Milk Colony, Aarey, Bombay.
Species	...	She buffalo No. 20-1161
Breed	...	Murrah.
Age	...	About 10 years.
Body weight	...	About 1200 lbs.

History :—The buffalo was purchased by the owner in 1955 and no particulars could be got about the history of the animal excepting that the buffalo might have had 3 calvings. She was on heat in February 1956, when she was inseminated but was found to be empty when examined in July 1956.

Diagnosis :—On rectal palpation, the genitalia was found to be intrapelvic and normal. On careful examination, aneurysm of the middle uterine artery on the right side was detected, measuring about 2″ on the long axis and 1½″ in width at the thickest portion. It was enlarging towards the efferent side of the artery. In form, it had bulbous shape on the efferent side and more or less conical on the afferent side. The walls were slightly thin as compared to that of case No. 1 and the size was reducible on pressure. The pulsation was more pronounced and regular. The aneurysm was located at a distance of 4″ from the right cornua.

Differential Diagnosis :—It is very likely that such a structure may be mistaken for an elongated cystic ovary or an abscess or other kinds of cysts in the broad ligament of the uterus and in attempting to rupture, it may lead to the rupture of the aneurysm with consequent profuse internal haemorrhage and death.

One has therefore to deal with such cases with great caution and not exert undue pressure on any swellings located in this region unless a clear diagnosis is arrived at by examining all the related parts of the genitalia in that region. In case of tumours and abscesses in this

region, it may lead to misleading diagnosis. It may therefore be mentioned here that in cases of aneurysm, the swelling becomes tense and large at each pulsation and can thereby be distinguished from the transmitted pulsation in case of tumours or abscesses situated just close to the artery. It may also be mentioned here that at times the aneurysm is embedded in an oedematous or connective tissue when pulsation may not be felt and in such cases, a very careful palpation is necessary for confirmation. In the case of abundant thrombus formation, the pulse is felt delayed and slow on the distal side of the aneurysm owing to stenosis of the afferent vessel by fibrin deposits.

Discussion :—From the location and structure of the aneurysms in the cases cited above, it is considered that it should have no relation to the animal's fertility. The genital system being otherwise normal, the aneurysm may not impede further pregnancies.

Although it is difficult to know the cause which lead to the formation of aneurysm, it is presumed that it might have developed during the last or one of previous gestations. In cases where the causes repeat in subsequent pregnancies, the condition is likely to be aggravated. The possibilities of the rupture of the aneurysm during advanced stage of subsequent gestation and more so during parturition cannot be over ruled. A fatal termination may result from pressure on the aneurysm, in cases of dystokia, where forceful extraction of the foetus is resorted to. It will be interesting to note further developments in the above two cases and efforts will be made to follow them up from time to time, particularly during the next gestation period.

It may be mentioned here that while selecting the stock, the recently calved animals usually escape examination of the genitalia on the plea that they had recently calved and as such everything should be normal. From cases recorded here, it is clear that such possibilities should also be remembered.

Summary :—A report on Aneurysm of the middle uterine artery in two she-buffaloes is placed on record. Differential diagnosis is discussed. Probable complications have also been discussed.

Acknowledgments

Thanks are due to Shri P. V. Naik, Veterinary Officer, Government Milk Colony, Aarey and to Sarvashri A. S. Kaikini, and G. S. Koranne, Research Assistants, Cattle Sterility Scheme, Bombay State, for their co-operation. Thanks are also due to Shri A. P. Dani, Research Assistant, Artificial Insemination Centre, Poona. for the diagrams.

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RADICAL OPERATION FOR THE REMOVAL OF THE VENEREAL TUMOURS IN DOGS

By

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Introduction

The occurrence of Venereal tumours is perhaps more prevalent in India as most of the canine population roam about without any control resulting in indiscriminate matings. The incideence in stray dogs is the highest but it is also seen in Bull terriers, Alsatians and Spanials.

Williams (1923) stated that a bloody discharge having foetid odour is the first clinical evidence and when the penis is exposed greyish red tumifications are noted.

Smith and Washbourn recorded in detail the extreme contagiousness of the growth by copulation.

James McCunn (1939) came in contact with a series of 9 bull-terrier bitches which were all infected with the venereal tumours by a dog suffering from the disease.

Symptoms:—Generally, occasional dis-coloured foetid bleeding through the prepuce even from the early stages of development of growths is overlooked by the owners. The swelling, continuous dis-coloured and foul-smelling bleeding and constant licking of the part by the patient due to irritation, catch the notice of the owner to bring the patient for examination and treatment. Ordinarily majority of cases are brought in very advanced stages where the entire glans upto the Os penis is involved making even the exposure of the penis impossible thus obstructing the normal free flow of urine through the prepuce.

Diagnosis:—It is easy and is based on the above clinical picture.

Case Reports:—This study involves 10 cases presented in advanced stages embracing the area from the glans upto the anterior part of the Os penis.

Breedwise distribution of cases

Alsatian	...	1
Bull Terrier	...	2
Spanial	...	1
Field Spanial	...	1
Terrier	...	2
Non-descript	...	3

Treatment:—Hobday and Dollar advise excision of the tumours. But in our experience, in most of the cases where tumours have been excised there has been recurrence. We, therefore, advocate amputation of penis, castration and sub-ischial urethrotomy.

Preparation of the Patients:—Food and fluids are withheld for 24 hours. Saline purgative is administered overnight. A few hours before operation, a high glycerine enema is given and lower bowels are completely emptied.

Preparation of the site:—A day prior to the operation, the part from the umbilicus to the anus and all around it including the sheath and the scrotum is carefully shaved (without causing any abrasions,) thoroughly cleaned with soap and hot water and painted with Acriflavine in spirit. A sterile pad soaked in Acriflavine spirit is applied over the part and bandaged.

Anaesthesia:—If the animal is vicious and uncontrollable a general anaesthetic is preferable, otherwise, operation can be done under epidural anaesthesia.

Out of 10 cases, 9 were operated under Nembutal Anaesthesia as described by Singh and Rao (1953) and one case was operated under epidural anaesthesia (2% xylotx 10 c.c.). 15 minutes prior to induction 1 c.c. of Liq. Adrenaline Hydrochloride is given intra-muscularly to avoid shock due to lowering of the blood pressure.

Operation:—Animal is secured on its back, all four legs are spread out and secured with hobbles and the bandage and sterile pad are removed The site is swabbed with Tincture Mataphane and draped with sterile towels leaving a window. Incision is started 1″ in front of the prepuce and continued posteriorly on both sides of the sheath upto the anterior part of the Scrotum. The tissue and fascia under the skin on both the sides are further separated and the haemorrhage controlled as it occurs with forceps and ligation. Skin flaps on both the sides are then exteriorised by means of towels and towel clips. The penis with its covering sheath is separated by blunt dissection and reflected posteriorly upto the anterior part of the scrotum. A triangular piece of scrotal skin with its apex anteriorly is excised, exposing the testicles and the cords which are pulled up separately and ligated. ⅓″ above the point of ligation the cords are cut and the testicles removed. The tissues and the fascia over the urethra behind the Os penis are separated. The dorsal arteries and veins of the penis are separated and ligated about 1″ posterior to the point of amputation of Penis. A metal dog catheter is introduced and kept as a guide to make a longitudinal incision in the urethra about ½″ long at the site of scrotum and is sutured on either side to the adjacent tissues with interrupted sutures either with the help of block braided silk (serum proof) or with intradermal nylon. About ¼″ posterior to the site of amputation a purse string suture is passed round the penis and tied tightly in the fashion of a pedicle suture with a 20 day old chromic catgut No. 2. The penis is amputated about ¼″ anterior to the point of ligation. The anterior portion of the stump is then anchored to the surrounding tissues with 3 interrupted 20 day old chromic catgut No. 1. The skin incision is approximated and sutured upto the anterior urethral opening, either with interrupted or with Foresell's subcutaneous and intra-cutaneous sutures. The skin at the scrotal area is also sutured to the adjacent tissue with interrupted sutures. A sterile pad soaked in acriflavine in sprit is applied over the operative area and bandaged leaving a window at the urethral opening, through which a human rubber catheter is introduced into the bladder and a pinch cock is applied. This is relaxed when evacuating the bladder.

After care:—50 c.c. of 25% Glucose Solution with Vitamin "C" is injected intravenously and coramin 1 c.c. subcutaneously to every case immediately after operation.

An Elizebethian collar is applied to the neck to prevent the animal, from licking and biting but in a few of the experimental animals, it was noticed that where the animals could not lick or bite the operative area, they started rubbing the buttocks and the urethral opening on the floor which resulted in damage to the sutures. To prevent this a special contrivance was evolved and it worked satisfactorily. This consists of an iron frame fixed to the hind quarters passed through the hind legs and buckled over the croup. There are two protruberances of iron projecting posteriorly which prevent the contact of the operated area to the ground even if the animal tried to rub. The frame is taken away every time the animal urinates and re-applied carefully.

Medicinal treatment:—Procaine Penicillin 4 lacs and Streptomycin ½ gm. every 12 hours for 7 days are injected intramuscularly. (Any broad spectrum antibiotics can be given with decided advantage).

In case the bandage is soaked with urine it is immediately replaced with a clean one.

The skin incisions healed up by first intention in all cases and all the skin sutures were removed on the 7th day.

Usually the patients cannot defecate for a day or two following the operations due to pain. So liquid paraffin by mouth is given for 2 days. Usually slight negligible oozing of blood at the urethral opening is noticed for 4 or 5 days during micturition due to erection.

Results:—Three animals operated 2½ years ago and seven animals operated ranging for 18 to 2 months have been under constant observation. The urethral opening is quite patent. All the animals after operation improved in health and put on flesh.

Summary

1. The uneventful recovery of 10 cases of venereal tumours in dogs by a radical operation is described.

2. The use of special contrivance to prevent the rubbing of the buttocks to the ground by the animals is described.

3. The incidence of this disease is more in stray dogs due to uncontrolled breeding. Nevertheless it is also observed in the other breeds.

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BOVINE LYMPHANGITIS - LYMPHADINITIS*

By

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History :—The condition was first recorded by Mr. Lopez, Veterinary Inspector, Dharwar Division, Bombay State, in the year 1919 who reported that there were in all 102 cases affected in the villages surrounding Halyal in the districts of North Canara and Dharwar (Bombay State). He then submitted the material collected from different affected cases for bacteriological examination to the I.V.R.I.

In the year 1951, Veterinary Officer, Halyal submitted specimens of pus smears from cases of multiple abscesses from bullocks suspected to be suffering from lymphangitis.

The then Bacteriologist Shri R. N. Naik took up the investigation further with the permission of the Director of Veterinary Services and visited four of the affected villages round about Halyal. This is therefore a record of investigations carried out in two of the reported outbreaks of Bovine lymphangitis and subsequent work done in determining the etiology of the disease at the Bacteriological Laboratory at the Bombay Veterinary College.

Incidence :—The observations recorded so far reveal that this is a chronic disease of cattle, characterised by suppuration of lymphatic glands and lymphnodes with the formation of odourless pus of varying consistency and development of laminitis resulting in overgrowth of hooves.

Cattle are affected irrespective of age and sex, buffaloes appearing to be comparatively refractory.

The disease was reported to be prevalent in villages mostly surrounded by thick forests, the rainfall of the area averaging 120" annually.

*This paper was presented and read at the sixth meeting of the Disease Investigation Officers' & Veterinary Research Workers' Conference in March 1956, held at the Indian Veterinary Research Institute Izatnagar.

The Mode of Infection :—The disease almost always appeared as a result of wound infection usually a yoke gall. However the biting flies abounded in such areas and a mechanical transmission through them contributing as a source of infection cannot be ignored.

Symptoms :—The first symptom in evidence was enlargement of one or more lymphatic glands, predominantly, the prescapular, the precrural, the popliteal, sub-parotid, and supramammary glands.

In majority of the cases the prescapular or precrural glands on one or both sides were affected though popliteal, subparotid and supra mammary glands were also frequently affected. Lymph nodes and vessels in the vicinity of the affected prescapular and the precrural glands as well as those on the face, neck and the trunk showed enlargments and suppuration though only in a few cases.

The glandular enlargements were cold and hard to touch in some cases, while they were soft and fluctuating in others. The size of the abscesses varied from a small marble to that of a fist, majority of them bursting spontaneously and evacuating their contents and smearing the surrounding area.

The wound thus formed either healed leaving a scar or it was fly-blown maturing into an open gaping wound with a foul smelling discharge.

The palpation of the abscess indicated that the enlargement was not one homogenous mass but that it consisted of two or more masses, the hard ones containing thick cheesy white odourless pus tinged with blood, whereas the soft ones contained creamy white odourless semi liquid and purulent matter.

The hooves in the affected cases showed characteristic lesions of laminitis irrespective of age and sex, particularly in the advanced stages of the disease.

The distorted condition, shape and size of the hoof changed the normal gait of the animal and the affected hooves showed considerable over growths. The appetite was maintained normal in all the affected animals till death. The body condition was also good in cases where the number of abscesses was only a few while in cases where there were multiple abscesses partial hairlessness of the body coat and unthrifty condition of the animal were noticed. No decrease in milk yield in milch cows or working power of the bullocks was encountered in the initial stages of the disease. The body temperature, faeces and urine were found to be normal.

In advanced conditions however bed-sores at the points of hip and shoulders were noticed and the animal was unable to stand and always was found in a recumbent position.

The hooves in all such cases were overgrown and the animal died of progressive emaciation and extreme debility.

Course of the Disease :—The duration of the disease was observed to be varying from 6 months to 2 years or even more.

In young animals the abscesses burst open spontaneously and the wound got healed. The percentage of mortality appear to vary from 5 to 15. The cultivators however were afraid of the condition more because of the affected animals becoming useless and uneconomic, dragging a miserable life especially when the disease is advanced and the condition is developing into a chronic one.

Etiology :—Mr. Sheather from I. V. R. I. in the year 1921 after examination of the material received from Mr. Lopez reported the following notable characteristics of the isolate :—

(1) It was very difficult to detect the organism by microscopic examination of the pus.

(2) The organism grew very slowly in primary cultures and that addition of serum to media favoured the growth provided the seed material was pure.

(3) The organism was pleomorphic and gram-negative.

(4) It was non-pathogenic to rabbit by intra-peritoneal inoculation.

(5) It caused purulent orchitis with considerable regularity in male guinea-pigs and with a peculiarity that after suppuration of the scrotum guinea-pigs recovered frequently.

(6) Abscesses in the various parts of the abdominal cavity particularly the omentum and the mesentry were frequently noticed.

(7) It resembled glanders bacillus in its pleomorphism.

The work on this condition was once again undertaken after nearly 30 years, actual places of outbreaks were visited and as many as available samples of pus from affected cases of bullocks, calves and cows were collected and inoculated on plain agar, blood agar, Loffler's media etc.

In all a total number of 28 strains of pure cultures were isolated.

15 isolates were gram-negative showing variable pleomorphism, 7 were strains of C. pyogenes liquifying Loffler's media, while the remaining 5 were identified as strains of pathogenic Staphylococci and one was haemolytic streptococci.

Intra-peritoneal inoculation of emulsified pus (in N. S. S.) into male guinea-pigs was carried out and out of the 8 samples thus treated 3 produced typical Straus' reaction.

Pure cultures of the organisms were isolated from the material obtained from the abscesses in the testicle, and the organism from these was indistinguishable in character from the original isolated from samples of pus obtained from affected cases.

Rabbits and sheep (two each) were inoculated with material producing orchitis in guinea-pigs, but nothing unusual was noticed in these animals during the period of observation of 15 days.

To find out the pathogenicity of the material with reference to cattle one hill bull was inoculated subcutaneously near the left prescapular gland with 1 c.c. of emulsion of pus sample No. 14 in N. S. S. which had given Straus' reaction in male guinea-pig. The animal showed enlargement of the gland after three days, which developed into a hard and painful abscess. Pus collected on puncture did not yield the original organism and the animal remained healthy during the period of observation of two months.

Another bull was inoculated on 9th May 1951 with young culture from one agar slant from sample No. 16 emulsified in N. S. S. 5 c.c. were injected s/c near the prescapular lymph gland, and another inoculum of 5 c.c. was introduced s/c in the neck. Three days after, the prescapular gland was enlarged nearly three times and was hard and painful to touch.

The animal subsequently developed abscesses in the region of the neck and became progressively emaciated and weak and ultimately succumbed to the infection on 30th July 1951.

The following were the post-mortem findings :—

The carcase was emaciated with abscesses of the size of an orange about 4" from the point of shoulder. The nearby prescapular lymph node was swollen and showed three abscesses containing caseated pus. The inferior cervical and sub-maxillary lymph nodes also showed abscess formation. The lung showed some nodules which on sectioning were found to be caseating abscesses.

The spleen though normal in size showed ecchymosis and a few nodular abscesses. All the other organs appeared normal.

The organism that was inoculated in the original culture was isolated from all the secondary abscesses noted on post-mortem.

A third bull was given s/c an inoculum of 5 c.c. on 10th May 1951, of slant emulsion of a young culture from sample No. 4 of in the

region of prescapular, lymph gland. 3 days after, the prescapular gland was enlarged, hot and painful. Progressive emaciation and debility developed and the animal succumbed to infection on 1st of August, 1951.

Post-mortem lesions observed were as under.

1. The carcase was emaciated, there were abscesses on the left and the right sides of the neck, the right shoulder, the posterior surface of the left fore limb, and the right flank.

The *rigor mortis* was absent and subcutaneous fat was very scanty. All the lymph nodes were normal; buccal mucous membrane was pale. Tongue, pharynx and larynx were normal. Anterior lobes of the lungs showed numerous nodules of the size of the napthalene balls.

On sectioning they showed caseating pus, lungs were also adherent to the thoracic wall.

Pure cultures could be isolated from the caseated pus from different secondary abscesses on post-mortem.

On inoculation into the male guinea-pigs, pus as well as the cultures produced typical Straus' reaction.

The other organisms isolated from the original pus samples like C. pyogenes, staphylococci and streptococci did not show any pathogenicity and produce any lesions on inoculation into small laboratory animals except a slight local swelling resolving after 2 or 3 days and as such the testing of these organisms for pathogenicity in their natural host did not arise. These organisms therefore appeared to be only secondary invaders while the pleomorphic Gram-negative bacillus that produced Straus' reaction in guinea-pigs and multiple secondary abscesses in the natural host was considered as a primary etiological factor in this disease condition. The notable morphological, cultural and biochemical characters as studied in this laboratory are given below :—

1. It is very difficult to detect the organism in the pus smear.

2. It grows very slowly in the primary cultures, but addition of serum hastens the growth.

3. It is a pleomorphic Gram-negative bacillus with a slight tendency to bipolar staining.

4. It is non-pathogenic to rabbits and mice on intra-peritoneal inoculation; however in one case one rabbit given serum agar slant emulsion intravenous developed pea-like nodular eruptions containing cheesy pus on both the ears and died after a period of 37 days. The original organism was recovered in pure culture from the contents of the nodule in the ear.

5. It exhibited with considerable regularity Straus' reaction on intraperitoneal inoculation in male guinea-pigs.

After suppuration of the scrotum guinea-pigs usually recovered but abscesses in other parts of the body were also frequent.

6. It is non-haemolytic and produces acid without gas from glucose, maltose, and mannitol and more slowly from arabinose, sorbitol and inulin but not from lactose, sucrose, salicin, raffinose, dulcitol, inositol and glycerol.

It is catalase positive and fails to produce indol or hydrogen sulphide. It does not reduce nitrates.

On the basis of the findings above, Shri R. N. Naik provisionally put the organism as Actino-bacillus Lignersi and forwarded the cultures to the I.V.R.I. for further confirmation (4–7–51).

The I.V.R.I. however after the examination of the specimens sent to them stated that the organism was found to be non-pathogenic to mice, guinea-pigs and hill bulls and further that culturally and biochemically, it exhibited a greater resemblance to Achromo-bacter group of organism although a definite identity could not be established. After the retirement of Shri R. N. Naik studies on the histo-pathological aspect of the disease condition were taken over by late Shri K.R.S. Aiyar, and as a result he came to the conclusion that no actinobodies were present in any of the affected tissues examined histopathologically. Pus smears from the lesions showed a few gram-negative organisms. No sulphur granules characteristic of actino-bacillus were present on examination of pus.

When a sample of pus granules cut in sections of tissues was stained and examined microscopically it did not show an appearance resembling that of a daisy flower.

Cultures were further sent for identification and typing both to Wellcome Research Laboratories and Weybridge Veterinary Laboratories, U. K.

Dr. Hudson from Weybridge Laboratory after studying the culture forwarded to him reached a conclusion that the organism was related to those of the genus Actino-bacillus. He was however unable to identify it with any normal organism.

He suggested that a further study of this condition be taken up to exclude the possibility of virus acting as a primary etiological factor, this particular organism playing only a secondary role.

It appeared to Dr. Francis from Wellcome Research Laboratories that the organism was most closely related to Pasteurella group and was

probably one of the avirulent or weakly virulent strains of doubtful pathogenicity.

Since the organism did not show any antigenic relationship to strains of Pasteurella, Brucella, Haemophihus, Pertusis, and Parapertusis groups of organisms in agglutination tests, according to him, it was very difficult for him to express any opinion on the significance of the isolate in question.

Conclusion

On review of the initial work at this laboratory it appears that though the correct identity of the organism is not so far established, the Koch's Postulates have been proved and an identical disease condition was produced except for the lesions of laminitis which were observed to be occurring only in chronic cases. It is interesting to note that an identical organism was isolated, by Dr. Sheather, I. V. R. I., from material obtained from the infected cases from the same locality ; he has however, not classified the organism as Actinobacillus Lignersi.

Attempts to identify and type the organism correctly from different well known laboratories yielded results of a confusing and different nature.

A CASE OF ABNORMAL THYROID IN A BUFFALO CALF

By

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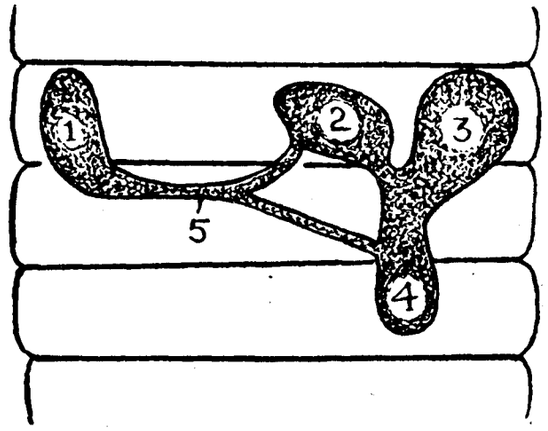
Assistant Lecturer in Anatomy, Madras Veterinary College.

In the Ox the Thyroid consists of two lateral lobes situated at the lateral aspects of the first one or two tracheal rings and a connecting isthumus.

A buffalo calf dissected on 2-12-54 showed the presence of an abnormal thyroid. The right lobe of the thyroid gland was single and normal in size. The left lobe was further split up into 3 minor lobes which can be designated as Anterior, Middle and Posterior. The isthumus was also seen to split into two on the left side joining the Anterior and Posterior lobes of the left part. (Fig.)

To understand the formation of this abnormality it is necessary to know the development of the thyroid which is briefly described here. The main mass of the thyroid gland develops from the floor of the pharynx. An endodermal pocket in the mid plane about the level of the first pharyngeal pouch is the thyroid diverticulam which soon becomes a solid mass attached to the pharynx by a narrow neck—thyro-glossal duct.

The neck is known as the thyro-glossal duct for the reason that it temporarily connects the primitive thyroid with the tongue primordium which is arising from the pharyngeal floor at the same time. This duct atrophies during the fifth week but its point of origin on the tongue is permanently indicated by an enlarged pit named Foramen Coecum. As soon as this duct atrophies the thyroid primordium is converted into a two lobed structure and by seventh week settles to a transverse position with a lobe on either side of the trachea. Actually the shift is illusory and is caused by the forward growth of the pharynx which leaves the thyroid behind. Later on two bodies-Ultimo Branchial bodies from the fifth pharyngeal pouches come into contact with the main mass and fuse with it.



Anterior view of Trachea with Thyroid in situ.

1. The right lobe of thyroid.
2, 3 & 4. The anterior, middle and posterior lobes of the left side.
5. The isthmus.

Sometimes accessory thyroids are formed by the persistent portions of the thyro-glossal duct or from the detached portion of the main primordium. In this case the left half of the thyroid primordium has undergone primary splitting resulting in the formation of anterior and posterior lobes the division extending into the left half of the isthmus also. Later the anterior lobe has undergone a secondary splitting giving rise to the middle lobe.

Acknowledgment

I thank Sri D. Mariappa, Professor of Anatomy, for his guidance in preparing this note.

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Clinical Articles

A CASE OF DIVERTICULUM OF OESOPHAGUS IN A MULE

By

Major Sundar Singh,

Veterinary Officer, Remount Training School and Depot, Saharanpur.

Cases of diverticulum of Oesophagus (*Oesophagocele*) are of very rare occurrence and their treatment is not of much avail. Hereunder is described a case of this condition in a 19 year—old army mule (No. 223K) which, after having seen much of active service both in war and peace, came for a much needed rest in the Remount Training School and Depot at Saharanpur.

Symptoms and Treatment :—The mule was admitted into the Veterinary Hospital of the Depot on 6th July 1956 with acute and intense symptoms of 'Choke'. There was restlessness, coughing, salivation and regurgitation and ejection of ingesta through the mouth and nose. The animal was in great distress in that on drinking a sip of water she was suddenly seized with an attack in which she lowered the head with nose drawn towards the chest, while the neck curved upwards ; this painful retching caused the mule to discharge ingesta through mouth and nose. There was no obstruction, palpable or visible, either in the pharynx or the cervical portion of the oesophagus.

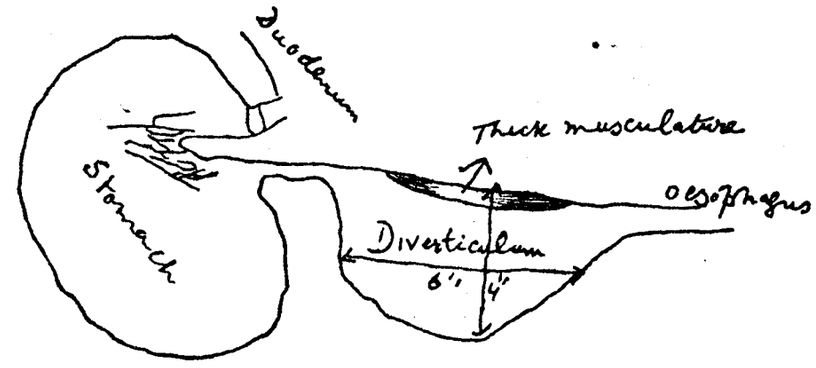
The treatment for Choke consisted of an injection of Pilocarpine and Eserine but was of no avail. After an hour the stomach tube was passed a good length upto 5½ feet without revealing any obstruction in the oesophagus. About 2 lbs. of water was pumped in through the tube without the least difficulty. This suggested it was not a case of 'Choke'.

Next day neither an injection of Arecoline s/c nor the repeated passage of the stomach tube did improve matter. The mule showed the same symptoms as on admission. She appeared both hungry and thirsty. But pumping into the stomach (apparently) of a very small quantity of water through the stomach tube brought on a painful attack in which the animal extended his head and neck bringing the nose towards the chest and vomiting through mouth and nose.

The injection of Carbochol 4 c.c. morning and evening was tried in vain. Slow administration of Extractum Belladonnae Liquidum in an oily base through stomach tube was found to be useless too.

It was now evident that this was not a case of 'Choke' as originally suspected. Whether it was a case of spasm and/or diverticulum of the thoracic portion of the oesophagus, was a mere conjecture now.

The intensity of symptoms described above, remained the same during the first week of the illness and abated considerably after that. The animal started nibbling green grass, ate bran mash of semi-liquid consistency and drank a little water out of the bucket. But every time she drank, a fit of vomiting came about, causing distress and restlessness. In the hope that the old veteran may get over its trouble gradually the symptomatic treatment was persisted. Having lost all hopes of its recovery and finding no other effective treatment the good old mule was cast and destroyed on 31st July 1956.



Postmortem Examination :—The postmortem examination was particularly directed to the observations of any abnormalities in the oral cavity, pharynx, larynx, oesophagus and stomach. Except oesophagus all the other organs showed nothing abnormal. There was a diverticulum about 6 inches long and 4 inches wide of the oesophagus at its terminal portion and about the capacity of 1½ pints. The diverticulum looked like the crop of a bird and lay against the hiatus for the oesophagus in the diaphragm. On incision, it was found to be filled up with chewed green grass and bran. There was no lesion in the mucosa except that the musculature of the upper straight edge was much thickened but not inflammed. An illustrative diagram of the diverticulum is given above.

A CASE OF URETHRAL CALCULUS WITH RUPTURE OF BLADDER IN A BULL

By

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History:—A bull aged 3 years belonging to Sri Ramamurthy of Appikatla (Guntur Dt.) was brought to the Dispensary with the complaint that it was not passing urine for the last 4 days. It was observed that both the flanks were full and waves of liquid were noticed on percussion on both sides. To be sure of the diagnosis, the bladder was examined per rectum. It was found ruptured, as the hand introduced moved freely (floating) on the urine that had evidently escaped into the peritoneal cavity through the rupture. Moreover the usual symptoms of kicking about the abdomen and restlessness were absent.

Diagnosis:—Urethral Calculus with rupture of bladder.
Prognosis:—Very grave.
Date of admission:—18-1-56.

Technique of Operation and Treatment

18-1-56.—After casting down the animal, the fore and hind limbs were tied separately, drawn apart and secured well. The penis was drawn with the aid of country twine. With necesssary asepsis, after straightening the sigmoid flexure, a copper wire with a brass bulb (which provisionally served the purpose of a catheter) was introduced and passed through the external urinary meatus. The presence of a calculus was felt and the location determined. With a sharp incision, the skin, the subcutis and the fascia around the penis were cleared. The stone was removed after incising the urethra. Sulphanilamide powder was dusted and the wound was allowed to heal as an open one. 20 lacs of Procaine Penicillin was injected i/m and a mixture containing Soda Bicarb, Soda Citras, Pot. Nitras, Mag. Sulph & Ammon. Chlor. was administered. The site of the operation was fomented in the evening. Urine flowed down both through the natural opening and the operated wound.

19-1-56.—Repeated injection, drench and fomentation. Urine was passed through both the ways. The animal did not show any signs of appetite. It readily drank a bucketful of water when offered.

20-1-56.—Repeated injection, drench and fomentation of the operated part. As on the previous day, urine flowed through both the ways. No appetite but took a bucketful of water.

21-1-56.—Repeated injection, drench and fomentation. Reduction in the size of both the flanks was observed. No appetite but took water. Less quantity of urine was passed through the operated wound and there was free flow of urine through the natural opening.

22-1-56.—Repeated injection, drench and fomentation. Further reduction in the size of the flank contents was noticed. The animal looked a bit lively and took a few blades of grass. A few drops of urine dribbled through the operated wound and natural flow noticed through the natural opening.

23-1-56.—Repeated injection, drench and fomentation to the part. Both left and right flanks were found tucked up. The animal began to eat a little bit more of straw and grass. There was complete cessation of urine through the operated wound but free flow was observed through the external meatus. The animal was able to move about freely.

24-1-56.—Repeated injection, drench and fomentation. No urine through the operated wound. The animal was more lively. It was found eating, drinking and ruminating as usual and passed urine freely as any healthy animal does. It was discharged cured with instructions to the owner to dress the almost healed up wound for a few more days.

Conclusion.—During my experience of about 17 years as Veterinary Assistant Surgeon, I have not had to experiment upon a Urethral Calculus case with ruptured bladder. I hear from Veterinary Assistant Surgeons ripe in experience that such cases prove fatal (due to ureamic poisoning) even after successful removal of the stones. With all that, at the request of the owner, I undertook this operation as an experimental measure.

The peculiarity about this case is that there was not the slightest swelling at the site of operation and the operated wound healed up by first intention probably due to the continued injection of 20 lacs of Procaine Penicillin daily for 9 days. During the course of the treatment, I have not observed any symptoms of ureamia. As I was sure of my diagnosis and equally sure that there is no hope of its survival, I never attempted to tap the abdomen and remove the fluid.

This experience gained, has only confirmed my belief that sometimes cases that are apparently hopeless recover due to Nature's miracle as it were. How this case recovered has been a miracle to me. Is it possible that the opening in the wall of the bladder after rupture has been closed immediately by some other tissue or structure, thereby preventing further infiltration of urine into the peritoneal cavity and obstruction to the natural outlet being removed, urine began to come out normally thereby assisting repair process in the wall of the bladder?

Whatever it may be, I consider this worth recording so that my professional colleagues, even if they find the bladder ruptured, may undertake the operation (if the rupture is of recent origin) and record their observations.

On enquiry, I understand that the animal is hale and healthy and the owner is putting the animal to all kinds of work as he used to do before the operation.

News and Views

The title of "Gopal Ratna" will be awarded by the Government of India to the owners of highest milk yielding cows and buffaloes of certain breeds in an All-India Milk Yield Competition to be organised for encouraging development of high milk-yielding strains of cattle.

Breeds to which the competition will be confined are Gir, Hariana and Kankraj amongst cows and Murrah amongst buffaloes.

Owners of the winning entries obtaining first place for each breed competition will be awarded, besides certificates of "Gopal Ratna" cash prizes of Rs. 2,000 each. Second prize winners will be awarded a merit certificate and a cash prize of Rs. 500.

The competition, which will be held primarily at the district level, will be subjected to re-checking by State Milk Yield Competition Committees, who will forward to the Central Council of the Gosamvardhana—the body which will organise the competition—the names of owners of the first three animals in each breed for which the competition is valid.

* * * *

The scheme should be made fool-proof and extended to a few other breeds as well.

* * * *

Not in India; but beware! Given unsterilised injections: 22 children dead. Belgrade (Dec. 7th)—The death roll rose to 22 yesterday in the Children's Clinic of Skoplje University, Macedonia, where 36 children suffering from meningitis were given unsterilised Streptomycin injections nine days ago.

The remaining 14 aged between two and 12, were seriously ill.

The Director of the Clinic, Dr. Haralampije Mancev, was yesterday relieved of his duties. The doctor who gave the injections and the nurse who prepared them have already been arrested.

* * * *

Any Administration Report is a drab affair; and that of a Municipal Body is the most complicated and controversial of all. And yet to make it highly enjoyable, educative and effective, by putting it in the mouth of a gipsy sooth-sayer in the form of a popular ballad is something unheard of in the realm of officialdom. The credit for such an achievement goes to the Commissioner of the Corporation of Madras, Sri D. Balasundaram, I.A.S. He virtually rose one morning to find himself famous, through this "Novel creation" as Mr. C. Rajagopalachari puts it.

* * * *

Madras, by force of circumstances is now a Tamil State and the metropolis of this State has taken the lead to present its Annual Report in regional language and in such a highly entertaining manner. We stop to visualise the amount of imagination and initiative behind this venture. We most heartily congratulate Sri D. Balasundaram on his 'Sennai Kuravanji'.

* * * *

We wish such ballads are composed with regard to the livestock improvement work in every State in local languages. It will be more appealing to the masses than any amount of pamphleteering or speech-making. These ballads could be played as Gramaphone records at the time of all fairs and festivals. Will any State Director venture and take the initiative?

* * * *

Sri Maheswar Prasad Singh, a Veterinary Graduate of the Bihar Veterinary College, returned recently from U.S.A., after obtaining M.S., degree in Animal Breeding from the University of Minnesota. Such specialisation is highly necessary, if we are to advance as a profession in this country. It is a happy augury that so many of our young men get themselves thus equipped for the task that awaits them in the near future. But do the States provide the necessary opportunities and facilities to these young men to make good use of the knowledge gained and thus benefit the country? We doubt much. It is up to the heads of Departments to properly plan and draw out the best from these young men and not allow them to wither away un-seen and un-appreciated.

* * * *

Dr. C. P. Ramaswamy Ayyar, in his Convocation address at the Banares Hindu University stressed the importance of English as "the repository and treasure-house of the results of world-wide learning and research in literature, arts, science and technology and any detraction from its importance and manifest utility would be incompatible with our aim of being a centre of free trade in universal knowledge and also a place of concourse". We agree. Let us not therefore neglect English.

* * * *

The new Veterinary College at Rajasthan had the distinction of holding a Seminar in 'Anatomy of the Domesticated Animals' under the distinguished guidance and supervision of Emeritus Professor Dr. James D. Grossman, G.P.H., D.V.M., (T.C.M. Expert Anatomist of the Ohio State University Team in India.) The Seminar was held from 10th to 22nd December 1956. This was indeed a happy idea and must serve as an inducement for many such Seminars in different subjects in this country. We most heartily congratulate that dynamic personality Prof. Aggarwala, the Principal of the College and Shri K. K. Vyas, Professor of Anatomy for this enterprising move in the study of Veterinary Science in this land.

* * * *

A major news announcement in the dog field for the first part of 1957 is that the noted Editor, Judge, and Dog authority, Cap. Will Judy, will come from Chicago, U.S.A., to judge the three Championship Shows in India—Calcutta January 12–13; Bombay January 19–20; Bangalore January 27.

Before returning to America, he will also judge the annual Championship Show of the Ceylon Kennel Club at Colombo Febuary 1–2, a return engagement.

Block Development Corner

[Articles under this section, should be more in the nature of simple 'talks' to rural folks and village level workers, on Animal Husbandry matters, and not loaded with scientific terms and theories.]

ARTIFICIAL INSEMINATION IN NIGERIA USING AIR TRANSPORTED BULL SEMEN*

By

J. Armour,
Veterinary Officer, Federal Government of Nigeria.
and
R. W. Sainsbury,
Little Horwood Cattle Breeding Centre.

Introduction:—The artificial insemination of Zebu cows with Friesian semen was undertaken with the object of investigating the productivity of the resulting crosses in suitably situated urban dairies in Nigeria. The work was carried out at the Livestock Investigation

*The Veterinary Record 140, dated 3rd March 1956. Workers intended for professional and others under N. E. Schemes *Ed. I.V.J.*

Centre, Vom, which is situated on a plateau 4,500 feet above sea level; the conditions were not, therefore, typical of West Africa. The choice of Friesian as the exotic breed to be used did not meet with general approval, but in view of work in Trinidad by L. R. Hutson (1953) the results may prove better than expected. As an adequate supply of solid carbon dioxide was not available in Vom, it was decided to send, by air, three fresh samples of semen each week, for a period of three months. All consignments of semen came from bulls at the Little Horwood Cattle Breeding Centre, Buckinghamshire.

Semen.—The semen was collected in the ordinary way, examined for density, motility, and then buffered in 50 per cent. egg yolk sodium citrate diluent. The raw semen was added to the diluent when the latter was at a temperature of 28° to 30°C and to which pencillin and streptomycin had been added, to give a concentration of 500 units per c.c. of each of these antibiotics in the diluted semen.

The mixture was then gently agitated and allowed to stand for 15 minutes at room temperature to facilitate antibiotic action. Cooling to 4°C. was effected in a refrigerator. Dilution rates at the Little Horwood Centre are normally in the region of 1 in 25 but the semen supplied to Vom was diluted 1 in 10. When the diluted semen had cooled to 4°C. it was transferred to a test tube, corked, sealed, wrapped in brown corrugated paper and enclosed in an empty rubber balloon. The protected test tube was then packed in cracked ice in a two-pint thermos flask which was placed in a cardboard container and taken to the airport. Semen collected early one day reached Vom *via* Kano at midday the next. With only two consignments was there an appreciable delay. On arrival the semen was unpacked, examined and stored in a refrigerator.

Insemination.—The cows inseminated were all the *Bos Indicus* type, being nondescript cattle of mixed white Fulani, Red Sokoto or Adamawa origin. The heat period of these cows was of short duration and the method of detecting oestrus was by the use of an aproned bull. Confirmation of heat was made by rectal palpation of the uterus and ovaries. The technique of recto-vaginal manipulation, as commonly employed in European breeds of cattle, was complicated by the sloping floor of the pelvis and sacrum. It was found impossible in some young heifers to pass the normal inseminating tube through the os uteri. In these animals the semen was deposited round the os. All pregnancy examinations were made eight weeks after insemination. At this time the sloping pelvis and sacrum aided diagnosis, as the uterus, even in multiparous animals, is seldom extrapelvic until the 10 to 12th week of pregnancy.

A goat about four months old was brought to the Key Village Centre, Barasahi on 2-8-56 with the history that it was suffering from severe diarrhoea since last four days mixed with much mucus. On microscopic examination of the faeces oocysts of coccidia and ova of Strongyloides and Haemonchus sps. were noticed. Then the number of eggs per gram (E.P.G.) of the faeces was recorded. The egg counting technique as recommended by Monnig was adopted in the present work. The goat was housed separately and the faeces was collected daily in conducting the experiment.

Juice was extracted from fresh green leaves of *Paederia foetida* by crushing them in a mortar and adding minimum quantity of water to facilitate better extraction. The goat was administrered orally one ounce, half-an-ounce and one ounce respectively of the juice on 4th, 5th and 7th August 1956. The findings of the results are given below in tabular form.—

Serial No.	Types of eggs detected in the faeces of the goat.	E.P.G. average of one day prior to feeding of Paederia foetida leaf juice.	E.P.G. Days after Paederia foetida leaf juice feeding.					
			1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.
1.	Oocysts of Coccidia.	1500	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
2.	Ova of Haemonchus sp.	500	100	100	100	100	Neg.	Neg.
3.	Ova of Strongyloides sp.	400	100	Neg.	Neg.	Neg.	Neg.	Neg.

The macroscopic appearance of the faeces changed gradually. On the first day after feeding with *Paederia foetida* leaf juice, the faeces became semi-solid but remained mucus coated. This persisted till the fourth day. On the fifth day, the faeces was semi-solid but free from mucus. From the sixth day onwards the faeces voided were in pellets and free from mucus.

Discussion

From the above experiment in can be seen that the *Paederia foetida* leaf juice was very effective against coccidia. The strongyloides sps. were more susceptible to it than Haemonchus sps. Since "*Paederia* foetida" is found in villages almost all over India, its leaves can be utilised as a remedy against coccidia instead of Sulphamezathine which is certainly costly for the poor villager. Besides, this leaf can also be used against Strongyloides and Haemonchus species of worms.

Acknowledgment

The author is grateful to Sri M. L. Bose, Retired District Animal Husbandry and Veterinary Officer, Mayurbhanj, Orissa for his suggestion that *Paederia foetida* leaf was effective against coccidia.

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I. C. A. R.

Farm News Releases

New Soybean Varieties—Early Yielders.—Three new varieties of soybeans, which are early maturing, high-yielding and sweet in taste have recently been selected at the Indian Agricultural Research Institute, New Delhi.

The varieties are *Monetta, Clemson* and *Palmetta.*

Green fodder from these varieties is usually available in 45 to 50 days and grain in 65 to 70 days after sowing. The local yellow variety, compared to this, takes 145 to 160 days to mature.

If the new soybean varieties are sown in August, they mature in mid-October, enabling the farmer to prepare his land for sowing the *rabi* crops.

The grain produced by these varieties is straw yellow in colour and bolder in size—230.

* * * *

Shearing of Sheep—Use Wooden Slats.—Movable wooden slats made of battons closely nailed with three-fourth inch nails are being recommended to farmers for use as a shearing surface.

Such slats will allow the dung, dirt and urine to drop down, and keep the fleece clean.

A clean, dry place is ideal as a shearing yard, as the wool does not get mixed up with dirt.

Farmers are also recommended the use of the right type of shears so that a uniform cut and quick shearing may be obtained. The Sheep Development Officer of the State will help in recommending the correct types of shears—248.

meeting commenced with all members standing in silence for 2 minutes to pray for the departed soul of one of its members, U. Patnaik and a condolence resolution expressing sympathy with the bereaved family was moved from the Chair and unanimously adopted.

Sardar G. B. Singh, B.A., M.R.C.V.S., F.R.V.C.S., (Sweden), Director of Animal Husbandry and Veterinary Services, Orissa, through whose initiative, the Association has been functioning well, was the chief guest of the meeting.

On being requested by the President, the chief guest delivered an inspiring address. He explained to the members the important role this Association could play in the improvement of the Veterinary Profession and livestock development. He assured the members his full support to shape the Association on lines similar to those of other professional bodies in foreign countries. He stressed on the need of complete unity among the members of the profession and requested them to muster strong round its banner. He emphasised on the immediate need to publish a journal, as the official organ of the Association.

The Secretary Sri J. N. Panda next read the report of the Association from its last meeting on 16-5-55 at Berhampur till 9-12-56. In his report, he acknowledged the support and initiative extended by Sardar G. B. Singh, Director. Besides, he made references to the return of Sri Singh from Sweden after advanced study in Gynaecology, deputation of 3 members to U.K. for training under Colombo Plan, and to felicitations extended during the year to Dr. Logerloff, Sri P. N. Nanda, Dr. Dutta, Dr. Sahai, Dr. Kehar, Dr. Sikka, Dr. Bhattacharya, Dr. Naidu, Sri Rajagopalan, Sri S. G. Iyer, Dr. Srivastava, who all had come to Orissa in connection with the Regional Animal Husbandry Wing Board Meeting, at Puri.

Sri L. D. Panda and Sri S. K. Sahai also spoke on the occasion advocating keen interest in development of different species of livestock, and stressing the necessity of strengthening the Association.

Next Sri M. Rath moved the Rules and bye-laws of the Association prepared by a sub-committee consisting of Sri M. Rath, Sri J. N. Panda and Sri B. Jethi and adopted by the Executive Committee. After thorough discussion clause by clause, the meeting adopted the Rules and bye-laws which include provisions for affiliation of the Association to the All-India Veterinary Association and election of District Representatives from each district for efficient working of the Association.

The following Resolutions were then moved and adopted :—

1. Resolved that the rules and bye-laws passed by the General Body be enforced with immediate effect.

2. Resolved that the newly passed rules and bye-laws of the Association be printed and distributed to the members.

3. Resolved that in appreciation of the notable contribution made by Sri R. L. Kaura, Sri P. S. Kuppuswamy and Sardar G. B. Singh for livestock development in Orissa, they be enrolled as Life Members and be requested to accept their membership.

4. Resolved that to re-vitalise and re-orientate the Association, all arrears of subscription be written off and collections started afresh from the month of December, 1956 when the new Rules and bye-laws come into force.

5. Resolved that persons who are in the Animal Husbandry and Veterinary Department and those that have retired from service but fulfill the membership qualification laid down in clauses 4 and 5 be enrolled as members from 9-12-56 without payment of admission fee but subject to regular payment of subscription with effect from December, 1956.

6. Resolved that Government may be requested to pass and enforce the act of registration of Veterinary Practitioners in the State.

7. Resolved that the Association should have an insignia of its own for printing on the journal and for use by members and for other purposes of the Association.

8. Resolved that a building at Cuttack for use of field members and for location of the Association office be rented from the Association funds.

9. Resolved that the Government and Municipal authorities be requested to entrust the ante-mortem and post-mortem examinations of animals slaughtered for food to Veterinarians.

10. Resolved that the Government be requested for the grant of land to the Association either at Bhubaneswar or at Cuttack for construction of a building for the Association.

The following office bearers were then elected by secret ballot to hold office for the next year :—

President	...	Sardar G. B. Singh (*Unanimous*).
Vice-President	...	Dr. G. Biswal.
Secretary	...	Sri J. N. Panda
Jt. Secretary-Treasurer	...	,, B. C. Naik.

Editor	...	„ B. Jethi
Member Auditor	...	„ M. Rath
Members	...	„ M. K. Patra
	...	„ B. Panda
	...	„ A. M. Rao.

Sri J. Das was elected as the non-official representative to the Interim Indian Veterinary Council.

Dr. G. Biswal spoke on the necessity of publishing a journal immediately and invited articles from the members. He congratulated the new office-bearers and hoped the Association will have a more vigorous life during the next year.

After a vote of thanks, the meeting terminated. A Tea-party on a lavish scale brought the meeting to a close.

J. N. PANDA,
Sceretary.

Correspondence

[*The views and opinions expressed in correspondence are those of the writers themselves and are not always endorsed by the Editor. Ed. I. V. J.*]

PREVENTION OF LOSSES IN POULTRY

I wish to refer to the article on "Prevention of Losses in Poultry" and also to your Editorial comments, both published in the *Indian Veterinary Journal* of May, 1956.

In the lecture given at the FAO Meeting on Poultry Production, held in Poona, I mentioned that in certain countries it is necessary to vaccinate chickens against Fowl-pox at an early age. I mentioned also the results we had obtained in Thailand with a pigeon-pox vaccine for use in day old chicks.

We have been continuing our work on Fowl-pox because we were not satisfied with the degree of immunity produced by our strain of pigeon-pox virus. We have now found a strain of Fowl-pox virus (egg adapted) which can be given with complete safety to day-old chicks by the wing web stab method. The usual localised pox lesion develops subsequently at the site of inoculation. No other reaction has been observed in the vaccinated chicks. The immunity produced by this Fowl-pox virus in day-old chicks is strong and lasts at least four months against artificial challenge with virulent field virus.

In Thailand, chicks one-day-old or more are now vaccinated simultaneously with Newcastle disease vaccine (strain F Virus) given intranasally and Fowl Pox vaccine given by wing web stab.

Many thousands of chicks of different breeds have been vaccinated in this manner. No adverse reaction has appeared. On farms where Fowl-pox is widespread all those chickens which show no lesions of pox are vaccinated. The results have been very satisfactory. The mildness of this strain of Fowl-pox virus readily permits the vaccination of chickens of all ages in infected poultry flocks. The strain of vaccine virus appears to be very suitable for the type of Fowl-pox occurring in Thailand.

I draw attention to these observations, because we have found this strain of Fowl-pox virus gives a much better immunity than the pigeon-pox virus described in my original lecture.

The vaccine strain of Fowl-pox virus described above was obtained originally from the Director, Ministry of Agriculture, Veterinary Laboratory, Weybridge, England.

Food and Agricultural Organisation,
Regional Office, for Asia and the Far East,
Phra Atit Road, Bangkok,
August 16th, 1956.

Yours faithfully,
J. E. LANCASTER.

Reviews

Veterinary Clinical Diagnosis.—By **Professor David Wirth.** First English Edition Translated and revised by **Annie I. Littlejohn,** *B. V. Sc.* (*Liv.*) *M. R. C. V. S.* viii 230 pages with 213 illustrations. Price 25s. net.Bailliere, Tindall & Cox, London, W. C. 2.

Messrs. Bailliere, Tindall & Cox, have added one more feather to their cap in bringing out an English translation of the above book of Prof. Dr. David Wirth of Vienna. It is a distinct service they have done to the English-speaking countries of the world in Veterinary Science.

To produce a 'text-book' of outstanding merit on procedures, observations, methods and means adopted in clinical diagnosis is indeed an effort of very high order. A practical and elusive subject has found a concrete shape in this book and it speaks to us like a first-rate clinical lecture in a well-ordered clinic, with the aid of highly realistic illustrations. It is a remarkable book and our wonder is that it took 22 years to get it translated from the date of its first appearance! It is a book that is bound to find its place, through sheer merit, as a text-book in all Schools and Colleges of Animal Husbandry, Agriculture and other allied sciences. And no library of reference books on Veterinary Science would be complete without this book on its shelf. The English translation is superb and no praise would be too high for the Editor Annie I. Littlejohn, B.V.Sc. (Liv.), M.R.C.V.S.

The Ongole Breed of Cattle.—By **Lt. Col. T. Murari,** A.I.A. (Aberystywth), Dip. in Rural Economics, B.SC., (Oxon), F.L.S., F.R.S.A., A.I.R.O. Published by the Andhra Animal Husbandry Association, Bapatla, 1956. Price not quoted.

The above is an useful brochure of about 56 pages, which gives in a nut-shell all relevant information on this famous breed of South India. The author has drawn freely on all the available information already existing and has added on to it the necessary classified data from the records of the livestock farms at Lam and Chintaladevi as they exist to-day. Such periodic survey of each breed of cattle is well worth undertaking and should form part of the programme of the Animal Husbandry Wing of the I.C.A.R. It will prove to be the much needed yard-stick to measure the progress made or otherwise, after all the ado we are making with regard to livestock improvement work in our land.

The useful part an Association could play in professional pamphleteering is well reflected in the publication of this booklet. We most heartily congratulate the young and energetic Andhra Animal Husbandry Association on this undertaking and only wish they had bestowed a little more care and avoided the few errors that had crept in.

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

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